Technical Environmental Study Chapters 1 and 2

Ten West Link 500kV Transmission Line Project

Prepared for:

US Department of the Interior

Bureau of Land Management

Yuma Field Office

Prepared By:

Stantec Consulting Services Inc.

2890 East Cottonwood Parkway, Suite 300

Salt Lake City, Utah 84121

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1.0 INTRODUCTION

This Technical Environmental Study describes the affected environment of, and environmental effects related to the Plan of Development (POD) for the Ten West Link 500 kilovolt (kV) Transmission Line (Project) proposed by DCR Transmission (DCRT) (Appendix 1, Figure 1.1-1). This Technical Environmental Study was compiled in support of the Ten West Link Environmental Impact Statement (EIS) being prepared by the United States (US) Bureau of Land Management (BLM) Yuma Field Office (YFO) and Palm Springs-South Coast Field Office (PSSCFO). Figures referenced in this Technical Environmental Study are provided as Appendix 1.

2.0 PROJECT LOCATION AND DESCRIPTION

2.1 INTRODUCTION

DCRT filed a right-of-way (ROW) application with the BLM to construct, operate, maintain, and decommission a series-compensated, 500kV alternating current (AC) overhead transmission line traversing approximately 114 miles in western Arizona and eastern California between the Arizona Public Service (APS) Delaney Substation and the Southern California Edison (SCE) Colorado River Substation. The Project, also referred to as the Ten West Link Transmission Line Project, is designed to transmit 3,200 megawatts (MW) and provide connection capability for new energy projects in the region.

This section provides a detailed description of the Proposed Action, a summary of the No Action Alternative, a description of the 45 analyzed Action Alternative route segments, and alternatives and alternative route segments that were considered but eliminated from detailed analysis.

DCRT has estimated a centerline and infrastructure requirements for the Proposed Action and Action Alternatives, taking into account topography, existing development, and other identified design challenges. The proposed Project ROW for the transmission line would include 100 feet on either side of the centerline, for a total width of 200 feet. In some areas the ROW may need to be wider or narrower to accommodate terrain, slope, and/or other facilities. The proposed ROW would likely be adjusted further as a result of final engineering. However, all efforts would be made to maintain a 200-foot-wide transmission line ROW and to minimize modification of the proposed centerline. Duration of Project disturbance has been described in terms of short term (during construction, projected to be approximately 2 years, and up to 10 years) and long term (life of Project anticipated to be up to 50 years, and could be renewed). As proposed, the Project would result in approximately 709 acres of short-term disturbance and 410 acres of long-term disturbance. Disturbance estimates and impacts are as accurate as possible at the time of writing and are expected to not vary substantially from those analyzed and presented in this study.

2.2 PROPOSED ACTION

2.2.1 Proposed Action Route

In order to effectively evaluate the Proposed Action in relation to the Action Alternatives, the Proposed Action route is divided into segments. Division of the Proposed Action route into segments would also allow for potential combination of Proposed Action segments with other

Action Alternative segments. The Proposed Action is divided into 19 segments (Appendix 1, Figure 2.2-1). The segment names of the Proposed Action route carry the letter "p" as an identifier, then each segment is numbered sequentially east to west from the APS Delaney Substation to the SCE Colorado River Substation. For example, starting at the APS Delaney Substation, the first segment of the Proposed Action route is identified as p-01. Table 2.2-1 provides descriptions of the individual Proposed Action segments.

Table 2.2-1 Proposed Action Segment Descriptions

SEGMENT NAME	DESCRIPTION	JURISDICTION MILES	TOTAL LENGTH
p-01	Begins at the Delaney Substation, heads north across I-10 and the Central Arizona Project (CAP), then heads generally west, crossing the CAP again and then paralleling the CAP, turning southwest, and crossing Interstate 10 (I-10) again. Crosses BLM-administered land, ASLD-managed land (Arizona state trust land), and privately-owned land. Located within a utility corridor on BLM-administered land, skirts southern end of the Big Horn Mountains Wilderness Area (WA).	BLM - 12.6 Private – 9.4 AZ State Trust – 4.7	26.7
p-02	From Segment p-01, heads southwest, across privately owned and Arizona state trust land.	Private – 0.5 AZ State Trust- 0.5	1.0
p-03	From Segment p-02, segment heads southwest across Arizona state trust land and BLM-administered land within a utility corridor.	AZ State Trust – 1.1 BLM – 1.0	2.1
p-04	From Segment p-03, heads generally west through Arizona state trust land and BLM-administered land, just north of Eagletail Mountains WA.	BLM - 5.0 AZ State Trust – 0.5	5.5
p-05	From Segment p-04, segment continues generally west through BLM-administered land within a utility corridor.	BLM – 2.0	2.0
p-06	From Segment p-05, this segment continues generally west through BLM-administered land and then through the Kofa NWR. The segment is within a utility corridor on BLM-administered land that borders the Plomosa and New Water Mountains to the north and the Kofa Mountains to the south. It crosses through the northern portion of the Kofa National Wildlife Refuge (NWR).	BLM – 10.8 US Fish and Wildlife Service (USFWS) – 24.9	35.7
p-07	From Segment p-06, this segment crosses BLM-administered land within a utility corridor, west of the Kofa NWR, heads west-northwest towards State Route (SR) 95.	BLM – 2.2	2.2
p-08	From Segment p-07, heads west-northwest to and across SR 95 on BLM-administered land south of the BLM's La Posa Long Term Visitor Area (LTVA).	BLM – 0.6	0.6

SEGMENT NAME	DESCRIPTION	JURISDICTION MILES	TOTAL LENGTH
p-09	From Segment p-08, heads west-northwest across SR 95 and through BLM-administered land within a utility corridor south of the BLM's LTVA; then aerially crosses the northeast corner and passes to the north of the Yuma Proving Ground (YPG).	BLM – 6.7 DOD – 0.2	6.9
p-10	From Segment p-09, traverses through BLM-administered land southeast of Copper Bottom Pass, which is narrow and contains steep rocky terrain.	BLM – 1.1	1.1
p-11	From Segment p-10, follows Copper Bottom Pass, southwest and upslope from the existing Devers to Palo Verde 500kV No. 1 (DPV1) line crossing BLM- and Bureau of Reclamation (Reclamation)-managed lands and within a utility corridor on BLM-administered land	BLM – 4.0 Reclamation – 0.1	4.1
p-12	From Segment p-11, heads southwest from Copper Bottom Pass through BLM- and Reclamation-managed lands.	Reclamation – 1.4 BLM – 1.1	2.5
p-13	From Segment p-12, heads southwest through BLM-administered land.	BLM – 3.5	3.5
p-14	From Segment p-13, heads southwest crossing BLM-administered land.	BLM – 0.9	0.9
p-15e	From Segment p-14, heads west-southwest through BLM-administered land and Arizona state trust land, then ends at the Colorado River.	BLM – 1.5 AZ State Trust – 1.3	2.8
p-15w	From Segment p-15e and the Colorado River, heads west. California State Lands Commission administers land submerged by the Colorado River; Colorado River itself is controlled by the State Water Resources Control Board (SWRCB) with Federal oversight.	Private – 6.6	6.6
p-16	From Segment p-15w, heads west across private agricultural land, up the bluff at the edge of the Colorado River floodplain, then onto BLM-administered land, turning northwest for a short distance.	Private – 4.2 BLM – 0.4	4.6
p-17	From Segment p-16, heads northwest across a combination of BLM-administered land and private land along the southwest boundary of the Desert Quartzite Project. Would parallel the southwestern boundary of the proposed Desert Quartzite LLC solar facility.	Private – 0.8 BLM – 2.3	3.1
p-18	From Segment p-17, heads generally northwest toward the SCE Colorado River Substation southwest of Blythe, where it terminates. Crosses a combination of BLM-administered land and undeveloped private land. Would cross the proposed Bright Source Energy Sonoran West and Crimson Solar Facility.	Private – 1.6 BLM – 0.8	2.4

AZ = Arizona; CA = California

2.2.2 ROW Actions and Potential RMP Amendments

2.2.2.1 ROW Actions

DCRT is a private entity with no land holdings in the proposed Project route ROW within the Proposed Action area; therefore, ROWs or easements for the entire length of the proposed transmission line (approximately 114 miles) would need to be acquired. All acquired ROWs and easements on private lands would be used to construct, operate, maintain, and decommission the proposed Project, including new access roads, where applicable.

DCRT proposes to acquire a 200-foot-wide ROW for construction, operation, maintenance, and decommissioning of the 500kV line and associated Series Compensation Station (SCS); and a 20-foot-wide ROW for a 12kV distribution line servicing the SCS. The ROW has been designed to allow for the safe movement and operation of equipment during construction and maintenance, the safe construction of the Project facilities, and to allow for sufficient clearance between conductors and the ROW edge as required by the National Electrical Safety Code (NESC; NESC 2017). While some access roads would be located within the 200-foot corridor, other access roads would be outside of it, however, with the intent to optimize the use of existing roads and trails.

The Project would require a 200-foot wide ROW grant from the BLM across approximately 56.6 miles of BLM-administered land. DCRT has requested a 50-year ROW grant from the BLM for the purposes of constructing, operating, maintaining, and decommissioning the Project. In addition to the BLM ROW, ROWs and easements would need to be acquired from the following entities, including but not limited to: the Bureau of Reclamation (Reclamation), in the form of a Use Authorization; the US Fish and Wildlife Service (USFWS), in the form of a Certificate of ROW Compatibility with the Kofa National Wildlife Refuge (NWR); and the Department of Defense (DOD), in the form of a US Department of Defense Lease Agreement (drafted by the US Army Corps of Engineers [USACE]), required for the Project's aerial crossing of the Yuma Proving Ground (YPG) military installation. The authorization of a ROW within the Kofa NWR requires a "Finding of Appropriateness of a Refuge Use" to determine whether the use meets the criteria for an appropriate use. Various Arizona and California state ROWs, easements, and/or permits would also be needed.

While some of the access roads would be located within the 200-foot ROW, other areas of access road would be outside of the ROW in order to optimize the use of existing roads and trails; these would require additional ROWs.

The Project owner's representative would negotiate a 200-foot wide ROW with affected private landowners based on the final approved route for the Project. Once the final route is defined, appropriate land value appraisal and negotiations with the private landowners would be initiated.

2.2.2.2 Potential RMP Actions

<u>Arizona</u>

ROW Actions and Conformance

Management Action LR-031 for Lands and Realty in the Yuma Resource Management Plan (RMP) states, "To the extent possible, locate new ROWs within or parallel to existing ROWs or

ROW corridors to minimize resource impacts. Locate new major ROWs and utility facilities in designated ROW Corridors, unless an evaluation of the project demonstrates location outside of a designated corridor is the only practicable alternative." This Study will determine whether an RMP amendment would be included to bring the Project into compliance with Management Action LR-031.

Visual Resource Management Conformance

The Yuma RMP also designates Visual Resource Management (VRM) classes for lands managed within the boundaries of the YFO. A number of the Proposed Action segments may not conform to BLM VRM classes assigned to the areas encompassing the segments. This Study will determine whether an RMP amendment would be included to bring the Project into compliance with VRM classes.

<u>California</u>

California Desert Conservation Area (CDCA) Plan of 1980 as Amended

Approximately 14 miles of the Project would cross the PSSCFO planning area in Riverside County, California, of which 3.7 miles is BLM-administered land. Therefore, this portion of the Project is located on public lands managed under the CDCA Plan of 1980 as amended, which provides the management framework for approximately 25 million acres of California desert, including 12 million acres of public land administered by the BLM. The goal of the Plan is to provide for the use of public lands within the CDCA in a "manner which enhances wherever possible – and which does not diminish, on balance – the environmental, cultural, and aesthetic values of the Desert and its productivity" (BLM 1980). All discussion in this document of possible RMP amendments within the Project Area in California refers to the CDCA Plan, as amended. The CDCA Plan was amended by the Desert Renewable Energy Conservation Plan (DRECP). Under the DRECP, Conservation and Management Actions (CMAs) regulating activities apply to this Project.

The Land Use Plan Amendment (LUPA)-BIO-PLANT-2 CMA, a requirement of the CDCA Plan, would apply to the Project, due to known occurrences of Harwood's eriastrum (*Eriastrum harwoodii*) within all alternatives in the California portion. LUPA-BIO-PLANT-2 states, "Implement an avoidance setback of 0.25-mile for all Focus and BLM Special Status Species occurrences. Setbacks will be placed strategically adjacent to occurrences to protect ecological processes necessary to support the plant Species (see Appendix Q, Baseline Biology Report, in the Proposed LUPA and Final EIS [2015], or the most recent data and modeling)" (BLM 1980).

The purpose of the LUPA-BIO-PLANT-2 CMA is to protect the ecological process of special status plant species in order to sustain viable, healthy populations. Ecological processes include, but are not limited to, pollinator access and movement, habitat change and movement (sand movement in the case of Hardwood's eriastrum), response to climate change, and gene flow. While LUPA-BIO-PLANT-2 prescribes a specific buffer to occurrences, it can be shown that the Project can avoid impacts to the ecological processes that support Harwood's eriastrum populations by incorporation of certain minimization measures (Best Management Practices [BMPs]) into the Project design.

2.2.3 Proposed Facilities and Infrastructure

The 500-kV transmission line would meet the latest revision of California General Order 95 for the portion of the Project in California and the NESC for the portion of the Project in Arizona. The design would be finalized in accordance with APS and SCE design standards for wire-to-wire interconnections at the substations.

2.2.3.1 Transmission Structures

Support structures are proposed to be steel lattice of various configurations. Steel lattice structures include self-supporting four-legged tangent structures (i.e., structures placed where the line does not angle more than 1 degree), guyed V structures with a single footing and four support guy wires, and two-legged H-frame structures as the primary structure types. Lattice H-frame structures are proposed for areas of active agricultural activity (Appendix 1, Figure 2.2-2). While monopoles are not proposed for the Project, they may be considered for private property if requested by landowners. For areas of conductor tension change, angles, and phasing transpositions, self-supporting four-legged dead-end structures would be utilized. A dead-end structure is a fully self-supporting structure that is used when the circuit changes to a buried cable, or at a substation as a transition to a "slack span" entering the equipment.

Guyed-V structures are proposed to be used in areas that do not parallel the existing DPV1, including in California. Guy wires would typically be located within the ROW, would have to remain at the grade that they were installed, and would have reduced distances extending from the structure foundation for lower height guyed-V structures. Permanent guy guards/markers would be installed on all guy wires for the guyed-V structures. In areas where the topography around guyed-V structure sites would result in anchors of the structure extending beyond the 200-foot ROW, self-supporting structures may be substituted to keep permanent facilities within the 200-foot ROW.

The structures would be between 72 and 195 feet in height, depending on the span length required and topography, with most being shorter than 142 feet. Span lengths between structures would vary from 400 to 2,300 feet, depending upon terrain conditions, current land use, structure type used, and to achieve site-specific mitigation objectives. However, the typical span would be approximately 1,500 feet. On average, three to eight structures would be placed per mile, depending on the structure type, topography, and angles of the route.

Additional refinements for structures shown in Figure 2.2-2 (Appendix 1) may be identified during preliminary engineering but are anticipated to result in similar design and height. Each structure type would be determined during final design and selected based on site-specific conditions or to mitigate impacts resulting from the Project.

The conductor, static wire, and optical ground wire (OPGW) would maintain a horizontal configuration for all structure types except monopoles. Conductor bundles for all structure types, except monopoles, would be installed at the same height on the structures with approximately 34 feet of spacing between the center of each conductor bundle. The static wire and OPGW would be approximately 30 feet above the phase conductors at the top of the structures.

The proposed transmission line would be located adjacent to existing linear facilities such as transmission lines, pipelines, and roads to the extent practicable. DCRT would attempt to match the Project structure locations adjacent to existing transmission line structures to the extent practicable.

2.2.3.2 Foundations

Each structure type requires specific foundation configurations. The guyed V structures require a center foundation and four anchors for the guy wires. The structure base would be a 9- by 9- by 24-foot deep precast concrete foundation. Grouted soil, grouted rock, or helical anchors would be used to secure the guy anchors in most cases; however, 3- by 24-foot concrete piers could be utilized if dictated by engineering.

For drilled anchors, each anchor hole would be about 4 to 8 inches in diameter and range in depth from 10 to 50 feet. Helical anchors could be up to 24 inches in diameter and range in depth from 20 to 40 feet. At each grouted guy anchor, a temporary trench (approximately 3 by 8 feet, and 3 feet deep) would be dug to capture grout that is re-circulated through the top of the anchor when the guy is pumped with grout. This short-term disturbance area would be contained within the 200- by 200-foot work area. The temporary trench, containing slurry from the grouting operation, would be backfilled to a minimum depth of 1 foot using excavated soil, and reclaimed. Where a minimum of 1 foot of soil cannot be established for reclamation, the consolidated slurry would be removed and disposed of off-site. In areas where the topography around guyed-V structure sites would result in anchors of the structure extending beyond the 200-foot ROW, self-supporting structures may be substituted to keep permanent facilities within the 200-foot ROW.

The self-supporting tangent steel structures would consist of four 4-foot diameter foundations, which would either be cast-in place concrete, a precast foundation, or grillage foundation. Dead-end lattice structures would have four foundations approximately 6 feet in diameter. Lattice H-frame structures would consist of cast-in-place concrete foundations that include four piers per tower leg centered on the corners of a 12- by 18-foot area. The steel monopoles would consist of one foundation, 4 to 6 feet in diameter, which would either be cast-in-place concrete or a pre-cast foundation. Each foundation would extend approximately 2 feet above the ground level.

Foundations for supporting structures would typically be drilled piers that are excavated with a truck-mounted auger. In rocky areas, foundation holes may be excavated by drilling or blasting methods, or by installing special rock anchor or micropile type foundations.

Given the Arizona/California southwest desert conditions, the alluvial plain of the Colorado River basin typically contains 7 to 10 feet of upper soils that are generally loose sand, silt, and alluvium. In these areas, shrink-swell concerns and collapsing soils are more the rule rather than the exception (DCRT 2019). This precludes DCRT from assuming that favorable soil conditions are present for the proposed transmission line; hence, DCRT has decided to use a combination of deep foundations and spread footers. The approximate foundations by structure type are as follows (note that soil conditions and environmental and engineering considerations may change the foundation size and depth):

- Guyed V Structure (Tangent): precast foundation 9 by 9 by 24 feet deep (one per structure); additional four grouted, or helical anchors for the guys. Under certain engineering conditions, concrete piers could be utilized.

- H-Frame Structure (Tangent): pier foundations 3 feet in diameter by 25 feet deep (eight piers per structure or four per tower leg).
- Self-supporting Tangent Structures: pier foundation 4 feet in diameter by 38 feet deep (four per structure).
- Self-supporting Dead-end Structures: pier foundation 6 feet in diameter by 38 feet deep (four per structure).
- Drilled Pier (steel monopole): pier foundation 4 to 6 feet in diameter by 38 feet deep (one per structure).

Helicopter-only foundation construction may result in excavations that must be "hand dug" (i.e., jackhammers and shovels). Foundation dimensions increase when dug by hand due to shoring requirements, safety harness requirements, and retrieval equipment requirements. Micropile foundations are an alternative to hand-dug foundations and can mitigate some of the hazards specific to hand-dug foundations. This specialized type of foundation consists of footing anchors into bedrock and requires a much smaller overall structure work area footprint and disturbance to install. Micropile structures can be completed in extremely rugged terrain with the use of specialized equipment and helicopter assistance (typically) to fly the equipment into the site. Hand dug or micropile foundations may be an optional installation in extremely rugged terrain for the Project. For each tower leg, micropile foundations would use a group of casings that would be drilled and grouted into the ground. The exposed portion of the pile group would be encased in a reinforced concrete cap from the top of the casings to a depth determined by the geotechnical study. The use of micropile foundations could reduce the required work area. Micropile foundations size would vary, but each micropile would generally range in size from approximately 5.5 to 9.6 inches in diameter and be 10 to 50 feet in depth. Each foundation would have a cluster of 3 to 20 micropiles, and each cluster would be capped with a welded plate. This cap would be slightly larger than the size of the micropile cluster, anticipated to be up to 7 feet in diameter.

Generally, work areas would be 200 by 200 feet in size (0.9 acre), but short-term disturbance of approximately 1.1 acres is conservatively estimated for each structure site (additional 20 percent).

A permanent footprint area at the base of each structure would be required for long-term maintenance. These areas would be somewhat larger than the structure foundations. The dimensions of the permanent footprint area for each structure type would be:

- Guyed V Structure: 9 feet by 9 feet (81 square feet), 4 anchors: 1 foot by 1 foot (1 square foot) each
- H-Frame Lattice: two 12- by 18-foot foundation areas (432 square feet)
- Self-supporting Structure: 50 feet by 50 feet (2,500 square feet)
- Steel Monopole: 12 feet by 12 feet (144 square feet)

In addition, the dimensions of a separate permanent work area for each structure are anticipated to be 50 by 50 feet (0.06-acre); this work area is in addition to the permanent footprint and foundation of the proposed structure (e.g., 50 by 50-foot footprint for self-supporting lattice structure).

While revegetation would occur in these work areas, minimal contouring would be performed.

2.2.3.3 Conductors

The conductors are the wire cables strung between transmission line structures over which the electric current flows. Conductors used for this Project would be aluminum stranded with a steel reinforced core, known as the aluminum conductor steel-reinforced design (ACSR). The aluminum carries most of the electric current, and the steel provides tensile strength to support the aluminum strands. The AC transmission line would consist of three phases for the single circuit, including a bundle containing multiple conductors per phase. The Project would use the Chukar ACSR conductor in triple-bundle configuration with 25 percent series compensation; however, actual conductor used would be determined in conjunction with final design.

The conductors are typically spaced approximately 18 inches apart in an equilateral triangle configuration. The bundle configuration would be designed to provide adequate current-carrying capacity while minimizing interference from audible noise and radio operations. The minimum conductor height above ground for the transmission line would be 36.25 feet for most of the route and 51.25 feet for the Colorado River crossing, based on North America Electric Reliability Corporation (NERC), NESC, California General Order 95, and DCRT's design standards.

Conductors are supplied on reels, where up to approximately 9,000 feet in length of conductor is provided on each reel. At the locations where one reel ends and another begins, splicing would be required to make a continuous run along the conductor. Splices would either be compression type or implosive charge type. Implosive fittings are compressed by means of a detonating cord charge that is initiated by a detonator. The implosive charge is supplied in two forms, either already wound onto the metal sleeve or as a separate sleeve that can be mounted over the metal sleeve at the job site. Compression type splices make use of traditional tools such as dies and hydraulic motor presses to join the conductors together. To reduce vibration fatigue on installed conductor and associated hardware, vibration dampers may be installed on the conductor where required and as specified in the final design.

California Independent System Operator (CAISO) specifications for this transmission line require that the electrical impedance of the line be below a specified level. The transmission line impedance is primarily a function of the length of the line, number of conductors in the bundle, type of conductor, structure-heights and type, conductor spacing, and the size of the SCS. For the Project, the maximum length of the line associated with a 25 percent SCS is 128.5 miles. Should the final line length exceed 128.5 miles, then actions would be required to offset the effect of the increased impedance due the increase in length. This could include increasing the size of the SCS above 25 percent, change in conductor spacing, or structure configuration. Large deviations in the length of the line may require a change of conductor, with a major redesign of the line.

2.2.3.4 Insulators and Associated Hardware

Insulators, which are made of an extremely low conducting material such as porcelain, glass, or polymer, would be used to suspend the conductors from each structure. Insulator assemblies may consist of single strings or two strings of insulators. Insulators inhibit the flow of electrical current from the conductor to the ground, the structure, or another conductor. Insulator material would be selected based on electrical properties and maintenance practices, according to final Project engineering.

2.2.3.5 Overhead Ground Wire and Electrodes

To protect conductors from lightning strikes, two overhead ground wires would be installed on top of the structures. Current from lightning strikes would be transferred through the ground wires and structures into the ground. One of the ground wires would be an extra high strength steel wire 3/8-inch in diameter. The other ground wire would be an OPGW constructed of aluminum and steel wires around a center core containing optical fibers for telecommunications and transmission line protection coordination purposes.

The OPGW installation would be similar to installing ground wire or any conductor on the line. The difference between the OPGW installation and others is a required continuity test, which is performed at several different times during construction. Continuity tests would be required when the OPGW drums are delivered on site, once the cable is installed on the structures, and finally once all splices are installed.

2.2.3.6 Grounding

The NESC does not give a specific resistance value for a benchmark for grounding transmission structures. Instead, the code defines effectively grounded as, "Intentionally connected to earth through a ground connection or connections of sufficiently low impedance and having sufficient current-carrying capacity to prevent the build-up of voltages that may result in undue hazard to connected equipment or to persons." DCRT would perform a lightning study to determine the target resistance value for grounding. During the detailed design process, DCRT would coordinate with SCE and APS to determine what these organizations are using for their assets in the area.

Upon completion of each structure installation, DCRT would measure the structure footing resistance to determine whether its target is met. If structure footing resistance is reached, ground rods would not be required. If the structure footing resistance is not reached, a 5/8-inch by 10-foot ground rod(s) would be installed until the target resistance is reached. If ground rods cannot be driven, or the target resistance cannot be achieved, alternate grounding procedures would be undertaken.

2.2.3.7 Other Electric Hardware

In addition to the conductors, insulators, and overhead ground wires, other hardware would be installed on the transmission structures as part of the insulator assembly to support the conductors and shield wires. This hardware would include fasteners, clamps, shackles, links, plates, and various other hardware composed mostly of galvanized steel and aluminum. To the extent possible, electrical hardware would be specified as "corona-free" to reduce the effects of audible noise and electrical stress caused by corona in high-voltage applications.

2.2.3.8 Other Nonelectrical Work

Other hardware not associated with the transmission of electricity may be installed as part of the Project as required by the Federal Aviation Administration (FAA), particularly in the Colorado River crossing area. These transmission line markings may include aerial marker spheres, structure painting, or aircraft warning lighting which would be in accordance with FAA or DOD consultation and FAA regulations (Circular 70/7460) for aircraft obstruction marking, as necessary. These lights would be solar powered and would not require additional electrical interconnection. Specifically, structure proximity to airports and structure height are the main factors determining whether FAA regulations would apply, based on an assessment of wire/structure strike risk. Currently, it is anticipated that all structures would be designed to a height of 199 feet or less.

Current guidelines and methodologies (Avian Power Line Interaction Committee [APLIC] 2012, 2006) would be used to minimize the potential for raptors and other birds to collide with, or be electrocuted by, the transmission line. For example, aerial marker balls, or other appropriate visibility markers would be placed on the transmission line at and near the crossing of the Colorado River to increase visibility to birds using that flight corridor. Flight diverters would be installed on all transmission activities spanning or within 1,000 feet of stream and wash channels, canals, ponds, and any other natural or artificial body of water. The type of flight diverter selected would be subject to approval by BLM, in coordination with USFWS and California Department of Fish and Wildlife (CDFW) as appropriate. Visibility markers would also be placed at other locations along the transmission line that are identified by the BLM and state wildlife agencies as having a high potential for avian collisions.

2.2.3.9 Series Compensation Station

A new SCS system would be needed and located under the new transmission line (or in very close proximity to the transmission line), parallel to the existing SCS associated with the DPV1 line. The SCS would be within the 200-foot wide ROW, approximately 47 miles from the APS Delaney Substation. This SCS would be equipped with switchable banks of capacitors inserted in series with a line to compensate for the voltage drop in the line, effectively allowing power transmission over greater lengths of line.

A general layout of the SCS is shown in Figure 2.2-3 (Appendix 1). In this design, the SCS is integrated into the footprint of the transmission line with a 200-foot by 315-foot (1.5 acre) fenced area. Any portion of the SCS disturbance that would be outside the 200-foot wide ROW would be separately authorized. Clearing of all vegetation would be required for the entire SCS area, including a distance of 10 feet outside the fence, for a total long-term disturbance of 1.7 acres. The ground surface within the fenced area of the SCS, and extending out up to 3 feet, would be covered with crushed rock. This is required for personnel safety due to grounding concerns and because of lower clearances to energized conductors within the substation as compared to transmission lines. These lower clearances are allowed by NESC (2012) because of the limited access to the SCS due to fencing and gates.

A fiber optic repeater would be located in the SCS using the same distribution line for backfeed to this substation. Under the Proposed Action, the new SCS would be connected to the same APS 12kV distribution line used for the existing DPV1 SCS. This existing three-phase distribution line would not need to be upgraded to accommodate the new SCS. The line connecting the new SCS to the distribution line would run along existing access roads and would require a 15-foot ROW along its approximately 1,000-foot length, and portions of this 15-foot ROW would likely occur within the larger 200-foot ROW for the transmission line. This line would require three new poles, either wood or galvanized steel. Each pole would be an average of 45 feet tall, would temporarily disturb approximately 0.04 acre, and would permanently disturb a 5-foot diameter area around each pole for a total long-term disturbance of less than 20 square feet per pole, or 0.0014-acre total.

Roads for access into the transmission lines would be also utilized for access to the SCS, given that the roads are adequate for the transport of materials and equipment necessary at the SCS.

The entire perimeter of the SCS would be enclosed with security fencing to protect equipment and prevent accidental contact with energized electrical equipment by authorized or unauthorized personnel. The fence would be a 9-foot chain-link fence with steel posts. One foot of barbed wire would be installed at the top of the chain-link, yielding a total height of 10 feet. Locked gates would be installed at appropriate locations for authorized vehicle and personnel access.

A grounding system would be required at the SCS for fault protection and personnel safety. The grounding system would consist of buried copper conductor arranged in a grid pattern and driven ground rods of adequate size, typically 8 to 10 feet in length. The ground rods and any equipment and structures would be connected to the grid conductor. The amount of conductor, size, length, and number of ground rods required would be calculated based on the fault current and soil characteristics. All metal structures and equipment would be connected to the ground grid via ground pig tails. The ground grid would extend approximately 4 feet outside of the perimeter fence to prevent unsafe reach-touch potential. Within the SCS there would be various pieces of equipment and piers that are part of the internal contents of the SCS.

Since the SCS would be unmanned, there would be no reason to maintain night lighting during normal operations. However, the SCS would have installed lighting to facilitate maintenance and repairs under emergency conditions during nighttime hours.

Two main types of high-voltage conductors are used in the SCS: tubular aluminum for rigid bus sections and/or stranded aluminum conductor for strain bus and connections to equipment. Rigid bus sections would be supported by porcelain insulators installed on steel supports. The bus sections would be welded together and attached to special fittings for connection to equipment. Stranded aluminum conductors would be used as flexible connectors between the rigid bus and the SCS equipment.

Storm water runoff containment ponds may be installed to moderate the discharge of storm water offsite if determined to be necessary in the course of design.

2.2.3.10 SCS Distribution Line

The Project's SCS would require the construction of an overhead 12-kV electric distribution line to service the SCS, to be built and operated by APS. The SCS distribution line would require a 20-foot wide long-term ROW.

Ground maintenance patrols would review the line periodically. Routine maintenance would include replacing damaged insulators as needed and tightening nuts and bolts, as well as vegetation maintenance. Access for operation and maintenance would be traveling overland within the ROW or on adjacent roads.

2.2.3.11 Substation Upgrades

DCRT has completed wire-to-wire interconnection facility studies with both APS and SCE for the Project. The purpose of these studies is to identify the effects of the installation of the Project on the existing transmission grid as well as to determine the specific facilities required to effectively interconnect the Project to the Delaney and Colorado River substations.

The Delaney and Colorado River substations have adequate room to accommodate all of the equipment associated with the interconnection of the Project. SCE and APS would perform all of the engineering, design material procurement, construction, and testing related to the interconnections of the Project to the Colorado River and Delaney substations, respectively. SCE and APS would add interconnection equipment structures within the boundaries of the two substations. It is estimated that it would take approximately 18-24 months to complete interconnection related work at the Delaney Substation, and approximately 27 months to complete the same task at the Colorado River Substation. DCRT anticipates the installation of the following equipment at both the substations to interconnect the Project to the existing 500kV buses at the respective substation:

500kV line position including -

- 500kV dead-end switchyard structure
- 3 - 500kV line drops
- 3 - 500kV coupling capacitor voltage transformers with steel pedestal support structures
- 2 - 500kV circuit breakers
- 9 - 500kV single phase disconnect switches
- 3 - 500kV single phase disconnect switches with grounding attachment
- 36 - 500kV bus support post insulators
- 1 - 500kV, 75 megavolt-ampere reactive (MVAr) line reactor (Colorado River Substation)
- 1 – 500kV, 136 MVAr line reactor (Delaney Substation)
- 1 - 500kV sync-opening circuit breaker
- 3 - 500kV disconnect switches
- 1 - 500kV 75MVAr, 3-Phase line reactor (Delaney Substation)
- 4 - 500kV surge arresters
- 1 - 25-foot high firewall
- Installation of protection relays, fiber optic cable, lightwave, channel, and associated equipment supporting protection and supervisory control and data acquisition (SCADA) system
- Installation of new 20-foot driveway and removal of existing driveway
- Installation of one 500kV transmission structure including insulator/hardware assemblies, and two spans of conductor between the Project's last structure located outside the substation property line and the dead-end substation structure at the substation

The equipment required to interconnect the Project to the Delaney and Colorado River substations is expected to be similar in type and size to the existing equipment at each substation. Exact equipment requirements would be determined after the completion of the facility studies by each interconnecting utility.

It is currently anticipated that the Project would connect to SCE's last structure located within substation property grounds but outside the substation fence at the Colorado River Substation. For the Delaney Substation, the Project would connect to the last APS tie-in structure inside the substation fence. At both substations, installation of one 500-kV transmission structure including insulator/hardware assemblies, and two spans of wire between the Project's last structure located outside the substation property line and the dead-end substation structure at the associated substation would be required.

CAISO requires the installation of one 75-MVAr shunt-reactor in the SCE Colorado River Substation and a 136 MVAr shunt-reactor in the APS Delaney Substation. Shunt reactors are voltage modulation devices that are generally installed to provide voltage control on transmission systems, thereby enabling the power system operator to maintain the terminal voltage within specified limits to ensure reliable operation of the bulk transmission network. There would be no new disturbance associated with these installations.

2.2.3.12 Access

Types of Access

Access to the ROW would be provided by existing roads and trails, such as those associated with the DPV1 transmission line and nearby pipelines, to the extent practicable. Access for the Project would be in accordance with an Access Road Plan would be included in the final POD prior to the Notice to Proceed (NTP). Five types of access would be used:

Access Type A – Type A access roads would include existing public or private roads that are parallel to the ROW, or a patchwork of existing roads in the area that would provide access to or would be crossed by Project segments. These roads consist of well-maintained county dirt roads, private roads, and all paved roads. Improvements to Type A roads may include repairs to the roadbed on dirt roads without additional disturbance beyond the existing roadbed width. Surface improvements to the roadbed would only be completed to allow for safe travel conditions.

Access Type B – Type B access roads would require some level of upgrade to allow sufficient access. In conditions required for construction passage, these roads may be bladed, compacted, and widened to a maximum of 18 feet for travel surface with up to 30 feet of total disturbance overall. This includes the 16-foot travel surface, 2-foot berms on either side, and 5 feet of material displacement on either side of the travel surface in steep terrain. In flat terrain with the exclusion of wash-crossings this total disturbance would be much less, with an approximate 18 feet of total disturbance. In moderate terrain, with the exclusion of wash-crossings, this total disturbance would be approximately 25 feet. In steep terrain with the exclusion of wash-crossings this total disturbance would be approximately 30 feet.

Access Type C – Type C access roads consist of newly bladed access roads down either side of the centerline of the conductor but within the 200-foot ROW corridor as much as possible. These roads would consist of 16 to 22 feet of travel surface, 2-foot berms on either side, with a maximum of 50 feet of material displacement in steep areas. In areas of flat terrain, except in wash crossings, disturbance would most likely not exceed 22 feet total for travel surface, berms, and material displacement. In areas of moderate terrain, except in wash crossings, disturbance would most likely not exceed 50 feet total for travel surface, berms, and material displacement. Where possible, areas that can support construction activities by drive-and-crush and/or clear-and-cut practices would be implemented.

Access Type D – Type D access spur roads would be constructed in areas where Type A, B, and C roads provide access to the vicinity of the ROW but are not adequate to provide access to structure locations. These roads would be new spur roads that would be bladed from the main access road to access the structure work areas. New spur roads would consist of native material displacement, and thus require larger disturbance areas in steeper terrain. Travel surfaces for new spur roads would range from 16 to 22 feet with 2-foot berms on either side excluding material displacement. For spur roads in flat terrain, material displacement would not exceed 3 feet on either side for a total of 22 feet if utilizing a 16-foot travel surface. For spur roads in moderate terrain, material displacement would not exceed 7 feet on either side for a total of 30 feet if utilizing a 16-foot travel surface. In steep terrain, material displacement would not exceed 76 feet of total disturbance, this includes a 22-foot travel surface, 2-foot berms on either side, and 25 feet of cut/fill on either side. Steep terrain is defined as slopes greater than or equal to 15 percent. Long-term disturbance would consist of the cut, fill, and road base travel surface required for continued operation and maintenance of the line. Total disturbances are estimated and would be calculated during the reclamation period. Where terrain and soil conditions are suitable, non-graded overland access (“drive-and-crush”) would be utilized. When drive-and-crush cannot be used, vegetation would be cleared, and roads would be cut as determined by terrain, soil, and vegetation (“clear-and-cut”). To the maximum extent possible, roads would cross drainages at grade (low-level crossing). In some cases, road cutting may be needed to drop access roads to the grade of the drainage bottom. Any material moved by road cutting would be cast upland and not deposited in washes.

Access Type E – Helicopter Access – In areas of particular biological, topographical, archaeological, and visual concerns, a helicopter may be used to assist with Project construction. Areas where helicopters would be used would also include the use of the other types of access roads (Types B, C, D), as possible. Roads would be used by light pick-up trucks or off-highway vehicle (OHV) for crew and tool access, and/or equipment whose tracks can adequately stay within the confines of the road disturbance boundaries without risk of roll-over or equipment failure due to stress loading of slope. However, all activities required for transmission line construction that would require large vehicles and equipment such as semi-trucks, tractor-trailers, and lo-boys would be conducted by helicopter application. Currently helicopter construction is expected for Segments p-10, p-11, cb-01, and cb-02. Table 2.2-2 provides a summary of the five access types that could be used for the Project and the associated disturbance widths for each type.

Table 2.2-2 Access Types and Disturbance Widths

SLOPE	TYPE A (EXISTING MAINTAINED ROADS)	TYPE B (UPGRADED EXISTING ROADS)	TYPE C (NEW CENTERLINE ACCESS ROAD)	TYPE D (NEW ACCESS SPUR ROADS)	TYPE E (HELICOPTER)
Flat (0-7.9%)	-	18 feet	22 feet	22 feet	-
Moderate (8-14.9%)	-	25 feet	30 feet	30 feet	-
Steep (>15%)	-	30 feet	50 feet	76 feet	-

All new access roads would follow existing contours and topography to the extent practical to help blend disturbance into the surrounding geography. Roads within the ROW can vary up to 25 feet within the ROW to avoid sensitive resources, reduce disturbance, or mitigate unanticipated constructability issues in the field. Such instances would include avoidance of special status plants, unanticipated cultural resource discoveries, and unforeseen steep washes/topographic features that would require avoidance. Grading for access would be limited to the extent practicable, and unnecessary grading would not occur. Access roads would typically be located within the 200-foot ROW and follow the shortest distance from structure to structure. The typical roadway approach includes a turning radius of 50 feet on either side. A 50-foot turning radius would be required at T or Y road intersections. Cross slope would be a minimum of 3 percent. The typical roadway approach includes a turning radius of 50 feet on either side for about 100 feet in length.

New access roads (Types B, C, and D) would also need 10-foot-wide pullouts with a total linear length of 150 feet (10-foot-wide by 100 feet with 25-foot tapers on each end). The pullouts would occur no closer than 1,000 feet on a single access road unless terrain requires less distance between them (e.g., blind corner or steep drop). The pullouts may be spaced greater than 1,000 feet at the operator's discretion.

Permanent access roads that are located outside of the 200-foot ROW would be needed and would require additional long-term ROW. Access roads not needed for operation and maintenance of the line would be restored to their previous condition following completion of construction.

Due to steeper than average slopes, access in the Copper Bottom Pass area poses unique challenges for the Project. There are currently no Type A roads present in the Copper Bottom Pass area, only Type B.

Existing main access roads through the Copper Bottom Pass area currently have an average overall disturbance width of 18 feet, allowing for 14 feet of driving surface. These roads are in relatively good condition and could be used during construction with only minor blading required within the existing footprint. Some of these access roads may require widening for construction support where the widths are not sufficient to support equipment traffic.

Type C access roads through the Copper Bottom Pass area would consist of newly bladed or upgraded roads which would provide access to Type B and D roads.

In order to reach the proposed structure locations in the Copper Bottom Pass area, Type D spur roads are proposed to be constructed. Some of the spur roads would be located in steep terrain with slopes that exceed 15 percent. Spur roads in steeper terrain would result in larger disturbance areas as described above (Table 2.2-2). There are also several proposed Type D spur roads for tracked equipment only to some structure sites for Segment p-11. These would be in areas where full access roads cannot be developed, but it is possible to provide access to tracked equipment only with an estimated maximum of 50 feet in width. These roads would be reclaimed to the fullest extent possible, as they are not suitable for use by operation and maintenance vehicles.

Helicopter Access

Helicopter support is essential to the wire stringing process, as it provides a vital tool to project managers, field supervisors, and crews to facilitate the construction process and to enhance the safety of the crews in the field. It is common to use a light helicopter to string the pilot line. The pilot line is attached to a hard line on the ground, which is then attached to the conductor for actual pulling of the conductor. Landing zones for helicopter operations during stringing of the pilot line would be confined to previously disturbed pad sites or puller/tensioner sites throughout the line.

Also, in areas where access roads are not feasible due to particular biological, topographical, archaeological, and/or visual concerns, helicopters would be utilized for structure construction and setting (Type E). Helicopters would utilize material lay down or helicopter fly yards for concrete transfer, steel storage, assembly, and refueling. Two fly yards, one on either side of the helicopter construction area, about five miles apart, would be sited in areas that need minimal grading. Duration of use for the fly yards is the same as the duration of construction activity within those segments. There would still be vehicle travel associated with helicopter use for crew and tool access under one of the other access road types described above. Helicopter construction would be anticipated for Segments p-09, p-10, p-11, cb-01, and cb-02.

In areas where crane access is not feasible, helicopters would be used to assist in foundation construction, airlift in sections of the structures, and to place structures on the poured foundations. Helicopters would pick up pre-assembled subsections of the structures, place them on the foundations, and ground crews would assemble the structures with hardware. This process would continue until the structure is erected.

DCRT or its' construction contractor(s) would ultimately decide the need for helicopter construction usage on the Project if not required by the BLM. The Helicopter Flight and Safety Plan would be included as a part of the final POD. The hours of operation and expected number of miles of structures that could be erected per day would be described in the Helicopter Flight and Safety Plan.

A MD600N type helicopter would be used for wire operations. The helicopter would be used for hauling and supporting personnel and equipment for the Project. It would also be used to fly sockline, crew members, ladders, baker boards, etc.

Prior to any helicopter operations, a daily tailboard meeting would be held with DCRT and/or their contractor employees, linemen, and the aviation crew. All personnel involved with the operation would clearly understand the scope of the work and the procedures that would be utilized. All persons working with the helicopter would be familiar with head and hand signals in the event of a radio malfunction or garbled reception.

Helicopter operations require helicopter fly yards, preferably one on either side of each helicopter construction area (about 5 miles apart maximum) for supporting helicopter only and helicopter assist construction:

Fly Yard 1 – Segment p-09, 5.8 acres of disturbance

Fly Yard 2 – Segment p-11, 20.0 acres of disturbance

Fly Yard 3 – Segment p-10 (and Alternative Segment cb-01), 7.6 acres of disturbance

Fly Yard 4 – Alternative Fly Yard – Segments cb-01/cb-02, 43.5 acres of disturbance

These fly yard locations were chosen because they limit the need for grading and can be fully reclaimed. Duration of use for the fly yards is the same as the duration of construction activity within the Copper Bottom Pass area and the adjacent segments.

The ground area in the fly yards and the ROW would be kept free of any debris and watered down by DCRT and/or their contractor to maintain environmental conditions (dust control). Prior to landing, the helicopter would communicate to water truck personnel and the area would be watered for dust compliance. Personnel would perform a ground walk-through prior to beginning flight operations to identify any potential hazards to persons or property on the surface. Helicopters would use existing disturbance bladed for the Project such as construction sites along the ROW to land.

Other operational activities that the helicopter operators may conduct in support of wire stringing operations are listed below. Helicopter operations would only be conducted when other traditional means are not available or practical; therefore, the helicopter would be utilized for the following operations:

- Crew transfers, placed atop towers, on the conductor wire
- Buggy cart, placement/removal
- Spacer cart support and resupply
- Ladder operations, placement/removal
- Traveler operations, installation/removal
- Grunt bag, placement/removal
- Belle marking, for plumb
- Dampener, installation/removal
- Marker ball, installation/removal
- Insulator operations, placement/removal
- Wire clipping, crew support
- Wreck out support in steep terrain

The Copper Bottom Pass area is within an existing BLM designated energy corridor, and has numerous previously constructed access roads, OHV trails, the DPV1 500-kV transmission line, and a natural gas pipeline, whose access roads would be utilized to the extent practicable to limit new access road construction. There are three potential construction options for the Project in the Copper Bottom Pass area:

Option 1: Erect structures using conventional construction methods, which would effectively limit helicopter use and thus reduce safety concerns.

Option 2: Erect structures using helicopter assist methods. Structure locations in this area do not provide potential for a safe and stable access road or structure work area unless a large area of grading occurs. Limited road development to these sites would allow for tracked equipment only to drill the foundations. These sites would require the use of a helicopter for construction activities other than drilling. In these areas, full access road development would require large disturbance areas, which would be limited by the use of helicopter-assist construction methods.

Option 3: Erect structures using helicopter only methods. Due to varying slopes and relief, certain structure locations through the Copper Bottom Pass area do not support the construction of access roads. The presence of steep slopes, washes, bedrock cliffs and ridges, building access roads and/or structure work areas for these sites would require large cuts/fills and skylining of roads. Using helicopter construction would mitigate the visual impacts otherwise resulting from the construction of these access roads. Use of helicopter assist or helicopter only methods in the Copper Bottom Pass area would require fly yards, as described in Section 2.2.7.2. Any additional landing zones and refueling activities would be at designated pulling or snubbing sites or pad sites with the proper fueling mitigation measures (MMs) implemented.

2.2.4 Induced Currents on Adjacent Facilities

AC transmission lines, such as the Project, have the potential to induce currents on adjacent metallic structures such as other transmission lines, railroads, pipelines, fences, or structures that are parallel to or cross the transmission line(s). Induced currents on these facilities occur to some degree during steady-state operating conditions and during a fault condition on the transmission line(s). Conducted currents on these facilities (directly to ground) occur during fault conditions. For example, during a lightning strike on the line(s), the insulators may flash over, causing a fault condition on the line(s); current would flow down the structure through the grounding system (that is, ground rod or counterpoise) and into the ground.

The magnitude of effects of the AC-induced currents on adjacent facilities is highly dependent on the magnitude of the current flows in the transmission line(s), the proximity and orientation of the adjacent facility to the line(s), and the distance (length) for which the facilities and the line(s) parallel one another in proximity.

The methods and equipment needed to mitigate these conditions would be determined through electrical studies of the specific situation prior to initiation of construction activities. As standard practice and as part of the Project design, electrical equipment and fencing at the substation would be grounded. Grounding of metallic objects outside of, but within 150 feet of the ROW, also may be implemented. These actions address most induced current effects on metallic facilities adjacent to the transmission line by shunting the induced currents to the ground through ground rods, ground mats, and other grounding systems, thus reducing the step and touch potential a person may experience when touching a metallic object near the line (that is, reducing electric shock potential).

If additional gradient control wires were needed for existing pipelines, they are expected to be located within the existing pipeline ROW. Not knowing the level of mitigation that may be needed, there could possibly be some disturbance from installation of the gradient wires. Prior to initiation of construction activities, an electrical study would be conducted to determine the extent and type of anti-corrosion mitigation that would be required. The gradient wires that may be required could be installed by different methods; trenching, ripping, or a combination of both.

Once the final route and any paralleled facilities, such as pipelines, have been determined, an induction study would also be completed for those facilities affected by the Project. Typically, a distribution supply line is needed to provide power for the compensation stations, fiber optic repeater stations, and cathodic protection equipment. The need for, and locations of, any new distribution lines would be determined as part of the detailed Project design, following issuance of the Record of Decision (ROD).

There are two different ways to provide cathodic protection: galvanic and impressed current. The method of cathodic protection would be determined as part of the study, and the most operationally- and cost-effective method to protect the facilities would be used. A distribution line (impressed current) would be used if existing facilities were available. If distribution lines weren't available where needed, other methods would be researched and used if feasible.

If any distribution lines were potentially required for impressed current cathodic protection, an induction study would be conducted once the Preferred Alternative was selected.

A fiber optic repeater would be located in the SCS, using the same distribution line for backfeed to this substation. For Segment p-06 (Kofa NWR), the distribution line for the SCS would tie-in to the same distribution line used for the DPV1 project.

The Project would intersect and parallel a Kinder Morgan Energy Partners Natural Gas existing pipeline ROW for a substantial portion of its length. While the width of ROWs varies based on anticipated maintenance needs and negotiations between utilities and landowners, typical pipelines in the region generally have permanent ROW widths of approximately 50 feet.

In the case of a longer parallel facility, such as a pipeline parallel to the Project over many miles, DCRT may undertake additional electrical studies to identify any additional MMs that would need to be implemented to prevent damaging currents from flowing onto the parallel facility and to prevent electrical shock to any people who may come in contact with the parallel facility. Some of the typical MMs that could be considered for implementation, depending on the degree of mitigation needed, can include the following (National Association of Corrosion Engineers International 2014):

- **Fault Shields.** Shallow grounding conductors connected to the affected structure adjacent to overhead electrical transmission structures, poles, substations, etc. They are intended to provide localized protection to the structure and pipeline coating during a fault event from a nearby electric transmission power system.

- **Lumped Grounding.** Localized conductor or conductors connected to the affected structure at strategic locations (for example, at discontinuities). They are intended to protect the structure from both steady-state and fault AC conditions.
- **Gradient Control Wires.** A continuous and long grounding conductor or conductor installed horizontally and parallel to a structure (for example, pipeline section) at strategic lengths and connected at regular intervals. These are intended to provide protection to the structure and pipeline coating during steady-state and fault AC conditions from nearby electric transmission power systems.
- **Gradient Control Mats.** Typically used for aboveground components of a pipeline system, these are buried ground mats bonded to the structure and are used to reduce electrical step and touch voltages in areas where people may come in contact with a structure and be subject to hazardous potentials.

Permanent mats bonded to the structure may be used at valves, metallic vents, cathodic protection test stations, and other aboveground metallic and nonmetallic appurtenances where electrical contact with the affected structure is possible. In these cases, no standard solution exists to solve these issues every time. Instead, each case must be studied to determine the magnitude of the induced currents and the most appropriate mitigation given the ground resistivity, distance paralleled, steady-state and fault currents, fault clearing times expected on the transmission line, and distance between the line and paralleling facilities, to name a few of the parameters. Should the electrical studies indicate a need to install cathodic protection devices on a parallel facility, a distribution supply line interconnection may be needed to provide power to the cathodic protection equipment.

2.2.5 Temporary Use Areas

Temporary use areas would be required for material staging, laydown yards, and helicopter fly yards during construction. These areas would be short term in disturbance and selected based upon the final alignment chosen for this Project, and located in previously disturbed areas to the extent practicable. Material laydown yards and staging yards would be utilized prior to the line construction beginning and would not be needed once the line is energized. Staging areas would be fenced with locked gates and may have security if necessary. Temporary staging areas would be powered by local distribution lines if available and necessary, or by diesel generator; in California, renewable energy sources would be used where feasible and available.

Batch plants would be co-located with material staging and laydown yards to the extent feasible and would not require additional short-term disturbance.

2.2.6 Existing Utility Lines and ROW Crossings

A number of existing electric utility ROWs are present near the Project which would require spanning or encroachment. The Central Arizona Project (CAP) canal has a varied ROW in the Project vicinity; the Project would cross the canal twice near the Big Horn Mountains and parallel it in areas to the west. The Proposed Action would also cross major roadways, including Interstate 10 (I-10), Arizona State Route (SR) 95, California SR 78, and local roads in Maricopa, La Paz, and Riverside Counties, where structures would need to be placed outside of existing ROWs.

2.2.7 Project Construction

2.2.7.1 Pre-Construction Activities

DCRT intends to refine the design of the Project during the Federal and state approval processes. Final engineering surveys would determine the exact locations of structures, access roads, etc. prior to construction. Access roads and structure locations would be designed based on topographic information, aerial imagery, and other relevant information in order to reduce overall impacts to resources. Results of the pedestrian cultural survey, biological surveys, and visual impacts would also be considered when micrositing the Project structures. Technical and power system studies would determine items such as conductor sizes, substation arrangements, communications needs, and similar needs. Due to the broad scope of construction, the varied nature of the construction activities, and the geographic diversity of the Project Area, multiple construction work areas would be simultaneously utilized in different areas to complete Project work within the projected timeframe and in accordance with industry performance standards.

Preconstruction activities, including preconstruction environmental surveys, materials procurement, design, contracting, ROW acquisition, and permitting efforts would all influence the Project schedule and timing of construction activities.

DCRT would obtain a ROW through a combination of ROW grants and easements negotiated between DCRT and various Federal, state, and local governments; private companies; and private landowners. During the early stages of the Project, DCRT would coordinate with property owners and land agencies to obtain right-of-entry permissions for surveys.

2.2.7.2 Construction Activities

Construction of the transmission line(s) would include the following sequence of activities:

- Surveying and staking the transmission centerline, structure locations, new or upgraded access roads, environmental cultural resources sensitive areas, other Project features, and work areas
- Upgrading or constructing temporary and permanent access roads
- Clearing and grading the structure sites, and temporary and permanent work areas
- Excavating and installing foundations
- Assembling and erecting structures with temporary and permanent work areas
- Stringing conductors and shield wires
- Installing counterpoise (structure grounds), where needed
- Post-construction cleaning up
- Constructing the SCS and associated power connection to the distribution line
- Reclamation

In addition to these activities, other preconstruction and construction components include:

- Conducting preconstruction resource surveys and aerial photography;
- Preparing construction material storage, laydown yards, and concrete batch plants located in previously disturbed areas and areas of lesser ecological sensitivity to the extent practicable;
- Preparing equipment staging areas located in previously disturbed areas and areas of lesser ecological sensitivity to the extent practicable;
- Preparing equipment refueling areas collocated with staging and storage areas where possible and in conformance with the Project Spill Prevention, Control, and Countermeasure Plan;
- Installing flagging, fencing, and signs in areas of active construction activities or where required for employee and public safety;
- Implementing transportation management for Project access and public safety as in conformance with the Project Traffic and Transportation Management Plan;
- Implementing fire protection as identified in the Project Fire Protection Plan;
- Blasting in areas of hard rock not removable by heavy excavators; in conformance with the Project Blasting Plan;
- Implementing erosion/dust control and air quality management in conformance with the Project Erosion, Dust Control, and Air Quality Plan;
- Implementing hazardous materials management in conformance with the Project Hazardous Materials Management Plan;
- Implementing emergency preparedness and response in conformance with the Project Emergency Preparedness and Response Plan; and
- Implementing control of noxious weeds in conformance with the Project Noxious Weed Management Plan.

Environmental Safety and Training

All construction and maintenance workers would be required to participate in an environmental education program prior to beginning work on the Project. This program would be developed by DCRT prior to the start of construction and would be submitted to BLM for review and approval prior to implementation. At a minimum, the program would include the following topics: biological, cultural, paleontological, and other environmental requirements and protection measures.

After participating in the training program, each trained worker would receive a card and hardhat sticker, indicating they are cleared for access to the ROW. The construction contractor(s) would provide the BLM's Compliance Inspection Contractor (CIC) with an updated list of those workers who have received the training. It is the responsibility of the construction contractor(s) to ensure that all construction personnel have received the required training. A noncompliance violation would be issued if a worker is found working on the ROW without the required environmental training.

In addition, the construction contractor(s) would be responsible for providing safety training as required. All construction, operation, maintenance, and decommissioning activities would be required to comply with Occupational Safety and Health Administration (OSHA) regulations. The

CIC would be notified by the construction contractor(s) of any accidents that occur on public land during construction of the Project.

All construction personnel working in California would be required to complete a 4-hour Leave No Trace awareness course.

General Construction Management and Controls

Vegetation Management

Prior to beginning construction, field surveys for noxious weeds, protected plants, and habitat for special status species would be conducted within the construction work limits. Vegetation removal in short-term disturbance areas would be conducted in accordance with IB-2012-097, Cutting, Removal, or Damage of Timber, Trees, or Vegetative Resources. As specified in the Habitat Restoration and Monitoring Plan (Appendix 2B), protected plants would be salvaged on Arizona state trust lands as required under the Arizona Native Plant Law (Arizona Revised Statutes [ARS] §§ 3-901 et seq.) and on other lands as directed by the BLM and other landowners and regulatory agencies. Temporary plant nurseries would be established along or near the transmission line ROW to maintain salvaged plants until they can be used for the revegetation of disturbed areas. The Vegetation Management Plan (Appendix 2B) describes vegetation management and control measures to be applied as needed during construction, operations, maintenance, and decommissioning of the Project.

Weed Management

Throughout construction of the Project, invasive and noxious weeds would be monitored and controlled as prescribed in the Noxious Weed Management Plan (Appendix 2B, Section 2B.11). Other strategies would be implemented to prevent, monitor, and control the spread of invasive and noxious weeds in compliance with BLM's policy of preventing the spread of these species. These strategies are intended to minimize the introduction of invasive and noxious weeds to the ROW. In general, all workers would attend training on identification and control of weeds. Prior to entering the work site, all vehicles, earthmoving, and excavation equipment would be inspected and cleaned of any extraneous soil and debris. Only certified weed-free straw, seed, and other materials would be used during reclamation and for other purposes. If invasive species were detected in locations disturbed during construction, immediate action would be taken to remove the invasive species from the affected area and to prevent them from spreading. Any use of herbicides would be done in accordance with a Vegetation Management Plan, and only BLM-approved herbicides applied in a manner consistent with regulations and label directions would be used.

Lighting

Given the extreme heat in summer and the short construction schedule, construction would include night work. Therefore, lighting would be used at worksites as necessary to maintain safe working conditions. Limited lighting in the material storage yards would facilitate earlier start times and improve overall safety.

Blasting

A Blasting Plan has been developed for the Project and would be included in the final POD prior to the NTP. Blasting would be required for areas where substantial hard rock is encountered and not able to be removed via heavy excavators. Blasting could be required for the installation of structure footings or to construct access roads. Blasting is not anticipated in sedimentary and surficial deposits, or in California.

Implosive sleeves may be used on the Project during wire stringing. Terrain and accessibility are a major consideration along with proximity to dwellings, gas lines, and existing transmission lines when deciding to use implosive fittings. Where topography allows, compression sleeves would be implemented, while implosive fittings would be utilized in steep mountainous terrain or long spans. Implosive sleeves would be used throughout BLM land instead of sleeving sites due to mountainous terrain. These sleeves would splice together where one wire wheel ends and the other begins. Implosive sleeves may be used at the puller/tensioner site and then the wire would be pulled through. If an implosive sleeve needs to be used midspan, the wire would be lowered, and a qualified handler of the implosive sleeves would hike out to the span and attach the sleeve and detonation device and wiring.

Topsoil Management

Temporary use areas such as material staging, laydown yards, and concrete batch plants would be located in areas of lesser ecological impact and previously disturbed areas to the extent practicable. This approach would minimize adverse impacts to topsoil. Depending upon selection of the Agency Preferred Alternative, some temporary use areas may be necessary in previously undisturbed areas. In these cases, proactive measures (Appendix 2A, Section 2A.2) would be taken to preserve the local topsoil and return the sites to their pre-disturbance conditions following completion of construction activities.

For all temporary use areas, a layer of topsoil would be initially removed from the area, in conformance with the Habitat Restoration and Monitoring Plan and the Site Plan for Soils and Hydrology, which would be included in the final POD prior to the NTP.

In general, the need for soil removal from short-term disturbance areas is anticipated to be minimal and would ultimately depend upon local site conditions at the selected area. Limited soil removal may be required for short-term disturbance areas based on geologic conditions for the following scenarios:

- Areas with unconsolidated soils which could not support the types of vehicles required to be used, soil types would typically include sandy soils. In this scenario, a temporary rock base may be installed to support vehicle traffic, and 1 to 2 inches of sandy soil may be temporarily displaced when the temporary rock base is removed.
- Areas with soils utilized for agricultural activities. In this scenario, topsoil may be removed from sites where short-term construction activities would occur and stored in an area where contamination would be limited. Typically, 3 to 6 inches of fertile topsoil may be temporarily displaced during construction activities.

- Areas where uneven soils are present and not able to support construction of transmission structures. In this scenario, grading of 0.5 to 3 feet of topsoil may be required where terrain would not allow a usable working pad. Soil would be temporarily displaced, then graded and contoured once construction is complete.
- Areas where terrain may cause erosion during construction. In this scenario, topsoil may be disturbed to place erosion control measures in place during construction and through site reclamation.

The topsoil would be stored within the general boundary of the disturbed area and covered with durable weather-proof material to protect from erosion, contamination, or wind-blown effects, as appropriate. The stockpiled topsoil would be stored as close to the site of removal as possible to minimize the need for transporting the topsoil and ensuring that topsoil from different areas are not comingled; stockpiles would not be aggregated with topsoil from other locations.

These soils would be replaced after completion of site-specific construction activities. After completion of construction related activities, the temporary use areas would be graded to near original and original topsoil would be replaced. Necessary treatments and seeding would be applied. The Habitat Restoration and Monitoring Plan (Appendix 2B) in conjunction with the Site Plan for Soils and Hydrology, which would be included in the final POD prior to the NTP, would specify in detail the methods for topsoil salvage and soil management practices to be followed for site reclamation.

Dust Control

Dust control would be managed in accordance with the Dust Control Plan for the Project (would be provided as a part of the final POD). In order to control fugitive dust, active construction areas would be watered. Water for dust control would be obtained by the construction contractor from private wells and/or a municipal water supply. Water would be provided by three 2,000-gallon water trucks, which would water access roads twice a day. Approximately 55,789,705 gallons of water would be required for dust control for the Proposed Action.

<u>Access</u>

Surface Access

As presented in Section 2.2.3.12, Type A roads would not require modifications; therefore, their use would not result in any new disturbance.

Low-lying vegetation would be driven on, rather than mechanically cleared, where practicable (overland driving/overland access). In areas where improvements to existing roads or new access routes are required (Type B, C, and D), roads and routes would be graded to provide a smooth travel surface. Where access roads and work sites must be leveled or otherwise cleared, topsoil would be salvaged and stored for future reclamation activities. Topsoil stockpiles would be stabilized and covered to reduce erosion and the potential for sediment-laden runoff during storms (see Topsoil Management).

It is expected that most of the access construction activities required for this Project would be performed without major import or export of cut and fill materials. It is likely that mountainous areas of the Project would require some cut material to be exported to an approved disposal location (in compliance with the Vegetation Management Plan) in order to construct access roads and structure foundations in higher elevations.

Access roads to each structure site would be constructed in a permanent manner to allow operations and maintenance staff to access each structure through the life of the transmission line. Access roads to material laydown yards, conductor pulling sites, and conductor snubbing sites (where the conductor is temporarily fixed or attached to the ground for conductor sagging purposes) would be short-term and only needed during construction.

Estimated disturbance acres of access roads needed for the Proposed Action are shown in Table 2.2-3 and all potential access roads are displayed on Figures 2.2-4 through 2.2-7 (Appendix 1).

Table 2.2-3 Proposed Action Access Roads and Long-term Disturbance Summary by Segment

SEGMENT	TYPE B (WIDENED EXISTING)	TYPE C (CENTERLINE ACCESS)	TYPE D (SPUR ROADS)	PULL OUTS (10' X 150')	TURN RADIUS	LONG-TERM DISTURBANCE (ACRES)
Arizona						
p-01	38.6	0.0	13.0	3.4	2.7	57.7
p-02	1.5	1.0	0.7	0.0	0.1	3.3
p-03	3.2	2.1	1.4	0.0	0.1	6.8
p-04	8.4	5.5	3.8	0.0	0.4	18.1
p-05	3.0	2.0	1.4	0.0	0.1	6.5
p-06	54.3	35.4	24.6	0.2	2.5	117
p-07	6.5	0.0	2.6	0.6	0.4	10.1
p-08	2.8	0.6	0.8	0.2	0.1	4.5
p-09	12.5	0.6	6.5	1.1	0.7	21.4
p-10[1]	3.7	4.1	4.7	0.4	0.2	13.1
p-11[1]	17.5	4.2	9.1	1.3	0.3	32.4
p-12	13.1	0.7	2.5	0.9	0.4	17.6
p-13	15.1	0.0	2.2	1.0	0.3	18.6
p-14	3.1	1.1	0.8	0.2	0.1	5.3
p-15e	6.6	1.1	7.1	0.6	0.3	15.7
California						
p-15w	0.0	0.0	3.5	0.2	0.6	4.3
p-16	2.6	0.0	3.0	0.3	0.3	6.2
p-17	6.6	0.1	2.0	0.6	0.3	9.6
p-18	5.9	0.0	2.0	0.5	0.3	8.7

[1] Helicopter use is anticipated for these segments.
Access Types A and E would not require any additional ground disturbance.
Construction of the distribution line to the alternative SCS would be accessed via existing routes and no new access would be required.

Fly Yards

Helicopter operations require helicopter fly yards, preferably one on either side of each helicopter construction area (about 5 miles apart maximum) for supporting helicopter only and helicopter assist construction. The recommended segment locations and acreage for fly yards through the Copper Bottom Pass area are provided in Table 2.2-4 below. These fly yard locations were chosen because they limit the need for grading and can be more easily reclaimed. Duration of use for the fly yards is the same as the duration of construction activity within the Copper Bottom Pass area and the adjacent segments.

Table 2.2-4 Fly Yards for the Copper Bottom Pass Area

NAME	SEGMENT	POTENTIAL DISTURBANCE ACREAGE
Fly Yard 1	p-09	5.8
Fly Yard 2	p-11	20.0
Fly Yard 3	p-10	7.6

The use of the yards would be to store all needed equipment, fuel tanks for the helicopter, concrete transfer stations, and steel pieces needed for the construction of structures fully erected and flown. Furthermore, the yards need to be level for crane access for placing steel during material delivery and steel erection.

Helicopter access is anticipated under the Proposed Action for Segments p-10 and p-11.

The Erosion, Dust, and Air Quality Plan would include information about the reduction of dust emissions generated from helicopter use.

<u>Series Compensation Station Construction</u>

Clearing and Grading

Clearing of all vegetation would be required for the entire SCS area (200 feet by 315 feet), including a distance of 10 feet outside the fence for a total estimated disturbance of 1.7 acres long-term disturbance. This is required for personnel safety due to grounding concerns and because of lower clearances to energized conductors within the substation as compared to transmission lines.

Vegetation would be removed and a 4- to 6-inch layer of crushed rock applied to the finished surface of the SCS. The SCS would be treated with a BLM-approved and authorized soil sterilizer to prevent vegetation to ease maintenance. The entire SCS area would be graded flat, with enough slope to provide runoff of precipitation. The SCS would be graded to use existing drainage patterns to the extent possible. In some cases, drainage structures, such as ditches, culverts and sumps may be required to control runoff. The topsoil would be removed. The topsoil would be covered once stockpiled. Topsoil storage at each location is assumed to be within each site disturbance and would not increase disturbance estimates (see Topsoil Management). Cleared and graded material would be disposed of in compliance with local ordinances. Material from offsite would be obtained at existing borrow or commercial sites and trucked to the SCS using existing roads and access roads.

Material Storage Yards

Construction material storage yards may include the SCS footprint or be leased by the contractor. A storage area for the SCS may be the same as or shared with transmission line crews.

Power Supply Distribution Line Connection

Under the Proposed Action, the SCS would be connected to the existing APS 12kV distribution line by a 1,000-foot connection line. Installation of the connection would be performed by APS and would take place over approximately two months. The three new poles for the line would be buried 6 feet below grade and filled with native soil. Structures would be monopoles, an average of 45 feet tall, with spans of 300 to 350 feet. Short-term construction areas for the structures would be 15-foot by 40-foot area (0.014-acre) around each pole site, for a total short-term disturbance footprint of 0.04-acre. The long-term disturbance area per structure would be 5 feet diameter.

The SCS distribution line associated with the Proposed Action along Segment p-06, parallel to the existing SCS, would be connected to the same APS 12-kV distribution line feeding the DPV1 SCS, located east of the Kofa NWR. The power required is relatively small, around 20 kW; a need to upgrade the existing 12-kV, three-phase line to accommodate the new load is not anticipated.

Construction of the distribution line would take approximately two months and would be performed by a crew of three APS workers using a standard APS service truck equipped with a driller and crane. Crews would also use a bucket truck, wire puller and tensioner. Limited traffic control may be required on the access road adjacent to the line, which would consist of signage and lane closure or deviation. The traffic control would be performed in accordance with Arizona Department of Transportation (ADOT) requirements. No additional material staging and laydown yards or batch plants would be required for the construction of the distribution line.

Transmission Line Construction

Temporary and Permanent Work Areas

A typical short-term disturbance area of 200 feet by 200 feet (0.9-acre) has been assumed for each structure work area, which would be used for assembly, erection, and crane pads. Short-term disturbance estimates are based on this assumption; however, actual disturbance would be reduced to the minimum size required to the extent practicable, based on site-specific conditions, during field staking prior to construction (BMP-MISC-02; Appendix 2A). Actual dimensions of the short-term disturbance area may vary, depending on factors such as terrain, structure size, and vegetation but would disturb a maximum of 1.1 acres. Short-term disturbance areas would be specifically identified in conjunction with structure locations and the Access Road Plan in the final POD, which would receive final approval from the BLM prior to NTP.

The foundation for the structures would be permanent or long-term disturbance for the life of the Project. A permanent work area at the base of each structure would be required for long-term maintenance. While revegetation would occur in this work area, minimal contouring would be performed. Table 2.2-5 shows the dimensions of this permanent work area for each structure type. Temporary and permanent work areas would be delineated by the construction contractor(s) in coordination with the CIC prior to construction, and the CIC would track the actual Project disturbance acreage.

Table 2.2-5 Land Permanently Required for Transmission Line Structures

STRUCTURE TYPE	AREA REQUIRED PERMANENTLY
Guyed V Structure (Tangent)	85 square feet total: 81 square feet, 9-foot by 9-foot pre-cast base; 4 grouted or helical screw anchors (1 square foot each)
H-Frame Lattice (Tangent)	432 square feet: two 12 by 18-foot bases
Lattice Structure (Tangent and Dead End)	2,500 square feet: 50-foot by 50-foot base
Steel Monopole (Tangent and Dead End)	144 square feet: 12-foot by 12-foot base
Additional Work Area per Structure	2,500 square feet: 50 by 50 foot

Table 2.2-6 provides the short-term and long-term disturbance estimated for the structure foundations construction and erection for the Proposed Action.

Foundation Installation

Each support structure would require the installation of foundations, which are typically drilled concrete piers.

Foundations for supporting structures would be drilled piers. Pier foundations are placed in a hole generally made by a truck-mounted auger. Reinforced steel and anchor bolts are placed into the hole using a truck-mounted crane. The portion of the foundation above ground would be formed. The portion below ground uses the undisturbed earth of the augured hole as the form. After the foundation has been poured, the forms would be removed, the excavation would be backfilled, and the surface of the foundation dressed. First, drilled shafts would be excavated for each structure: four holes for each self-supporting structure, eight holes for each H-Frame structure, and one hole for each guyed V structure and steel monopole. If determined necessary, guyed V structures would also utilize four holes, one for each guy. The holes would be drilled using a truck-mounted excavator equipped with augers of various sizes depending on the diameter and depth requirements of the hole to be drilled. Excavation spoils would be evenly spread out within the ROW in the vicinity of each structure, unless specifically prohibited by the landowner. Spoils would be crowned around the foundations to provide positive drainage away from them.

Where solid rock is encountered, blasting, rock hauling, or the use of a rock anchoring or micro-pile system may be required. The rock anchoring or micro-pile system would be used in areas where site access is limited or where adjacent structures could be damaged by blasting or rock hauling activities. Such anchoring systems may also be used where economically and technically justified. Materials used for rock anchoring or micro-pile systems would be stored in the staging areas and not on the ROW.

Table 2.2-6 Structure Type and Disturbance Summary by Proposed Action Segment

SEGMENT	LINE MILES	TOTAL STRUCTURES	SELF-SUPPORTED TANGENT	GUYED V	SELF-SUPPORTED DEAD-END	H-FRAME	MONO POLES	SUBSTATION DEAD-END	S-T DIST. AREA[1] (ACRES)	L-T DIST. AREA[2] (ACRES)
Arizona										
p-01	26.7	88	82	0	5	0	0	1	96.8	10.1
p-02	1.0	4	0	3	1	0	0	0	4.4	0.3
p-03	2.1	6	0	6	0	0	0	0	6.6	0.4
p-04	5.5	15	0	14	1	0	0	0	16.5	1.0
p-05	2.0	9	0	9	0	0	0	0	9.9	0.5
p-06	35.7	120	1	103	16	0	0	0	132.0	8.1
p-07	2.2	7	0	5	2	0	0	0	7.7	0.5
p-08	0.6	2	0	2	0	0	0	0	2.2	0.1
p-09	6.9	23	3	17	3	0	0	0	25.3	1.7
p-10	1.1	5	5	0	0	0	0	0	5.5	0.6
p-11	4.1	14	13	0	1	0	0	0	15.4	1.6
p-12	2.5	8	1	6	1	0	0	0	8.8	0.6
p-13	3.5	10	0	9	1	0	0	0	11.0	0.7
p-14	0.9	3	3	0	0	0	0	0	3.3	0.3
p-15e	2.8	10	7	0	3	0	0	0	11.0	1.2
SCS Dist. Line	0.2	3[3]	0	0	0	0	3[3]	0	<0.1	0.0
California										
p-15w	6.6	24	1	0	0	23	0	0	26.4	1.7
p-16	4.6	18	3	0	0	15	0	0	19.8	1.4
p-17	3.1	12	11	0	1	0	0	0	13.2	1.4
p-18	2.4	10	8	0	2	0	0	0	11.0	1.2
Total	114.3	388	140	174	37	38	0	1	426.8	33.1

S-T: short-term; L-T: long-term.

Assumptions: Short-term disturbance areas include 20 percent buffer addition for final design considerations (200' x 200' = 0.9 acre + 20% = 1.1 acre).

[1]Short-term disturbance assumes approximately 1.1 acres per structure site.

[2]Long-term disturbance assumes the Project structure permanent work areas as described in Section 2.2.3.2. Segment numbers rounded to nearest tenth so may not match total when added.

[3] These structures would be either wood or galvanized steel monopoles. These are not included in total.

For helicopter-assist construction, conventional drill rigs would be used to dig out the excavation. A helicopter would then be used to set the steel reinforcement (typically anchor bolt cages reinforced with rebar, or all-rebar cages). Concrete would be flown in by a heavy-lift helicopter using buckets. To protect the public, signs would be posted indicating construction times and possible disruptions at the entrance of the canyon prior to construction. Limiting the helicopter use by utilizing conventional construction wherever possible would limit these interruptions and decrease the number of trips in and out of sites to pour concrete.

In areas where wheel-mounted access is not possible, crews would hand dig foundation holes for each structure. Crews would hand dig foundation sites utilizing both powered and non-powered digging tools to the specifications of the design. Once the foundation excavation is complete, spoils from excavation would be airlifted offsite by helicopter and be placed in an approved spoils location or laydown yard for storage or offsite disposal. The contractor would then place steel reinforcement bars into the foundations as required by the design. Once the reinforcement bar installation is completed, the contractor would have concrete airlifted to each site by helicopter and foundations would be poured using hand tools. This type of work would only be required for sites where vehicle access is not feasible.

Reinforced steel and anchor bolts would be transported to each site by truck, either as a prefabricated cage or loose pieces, which would then be fabricated into cages on the site. Concrete would be hauled to the site in concrete trucks. Water would be required for concrete mixing. Excavated material would be spread at the site or disposed of in accordance with local ordinances and per agreement. Structures and equipment would be attached to the foundations by means of threaded anchor bolts embedded in the concrete. Some equipment such as transformers may not require anchor bolts. They would be secured to the foundation by other means. Water for SCS foundation construction is included in the construction water needs.

Steel reinforcing cages and stub angles would be installed for all lattice structures. The foundations would be designed to satisfy all Federal, state, and local design codes. The lattice structure holes would be approximately 4 to 6 feet in diameter, depending on whether they are tangent or dead-end.

Concrete would be acquired as a commercial product from a supplier. Typically, concrete would be delivered directly to the site in concrete trucks with a capacity of up to 10 cubic yards. However, in areas with limited access or environmental constraints, the concrete would be placed in the excavation with either a crane and garbro bucket, or pumped from a distance of several hundred feet. Each foundation would extend approximately 2 feet above the ground level.

Structure Assembly and Installation

At local assembly and staging areas, materials would be staged, and subassemblies may be fabricated. From these local assembly and staging areas, material and subassemblies would be delivered to the structure sites via flatbed truck or helicopter if required. Subsequent to full or partial assembly, sections of the structure would be assembled adjacent to the structure location. Supporting steel structures would be erected on concrete foundations. These would be set with a truck-mounted crane and attached to the foundation anchor bolts by means of a steel base plate. These structures would be used to support the energized conductors and certain types of equipment. This equipment would be lifted onto the structure by means of a truck-mounted crane and bolted to the structures, and electrical connections would then be completed. Some equipment would be mounted directly to the foundations without supporting structures; these would also be set in place by means of a truck-mounted crane. The crane would move along the ROW as structures are erected. Some of this equipment requires assembly and testing on the pad. Electrical connections to the equipment would then be completed.

Structure assembly using helicopters would use sky cranes. Due to the overall steepness of each site requiring helicopter construction, steel bodies (sections of the structures) would have to be erected in an adjacent fly yard and flown in by the sky crane to each structure site and subsequently, then each head of the tower. The heads and bodies of the structures would have to be assembled in the fly yard area and delivered via sky crane to erect on the pad site. For comparison, steel erection using conventional equipment involves the lattice pieces being hauled by the bundle to the tower site and assembled on the structure pad. The steel is built in sections and then erected together using a combination of forklifts (telehandlers) and rough-terrain or all-terrain cranes.

Wire Stringing

Conductor, shield wire, and OPGW would be placed on the transmission line support structures by a process called stringing. Conductors with a non-specular finish would be suspended from insulator assemblies. Overhead ground wires and OPGW would be located on the peaks of each transmission structure and function to intercept lightning that would otherwise strike the conductor. All structures with a single shield wire peak would have OPGW installed at the structure peak. All structures with dual shield wire peaks would have OPGW installed on one peak, and steel shield wire installed on the other. Additionally, a grounding system would be installed at the base of each transmission structure that would consist of copper ground rods embedded into the ground in immediate proximity to the structure foundation and connected to the structure by buried copper lead.

The first step to conductor and shield wire stringing would be to install insulators and stringing sheaves. Stringing sheaves are rollers that are temporarily attached to the lower portion of the insulators at each transmission line support structure to allow conductors to be pulled along the line. A lightweight rope known as a finger line may be placed through each sheave with each end extending to the ground. Additionally, temporary clearance structures would be erected where required prior to stringing any transmission lines. The temporary clearance structures are typically vertical wood poles with cross arms and are erected at road crossings or crossings with other energized electrical lines to prevent contact during stringing activities. Bucket trucks may also be used to provide temporary clearance. Bucket trucks are trucks fitted with a hinged arm ending in an enclosed platform which can be raised to let the worker in the bucket service aerial equipment.

Once the stringing sheaves and temporary clearance structures are in place, the initial stringing operation would commence. This would consist of pulling a pilot line through the sheaves, using the finger lines, along a section of the alignment. The pilot line is then attached to the hard line, which follows the pilot line as it is pulled through the sheaves. The hard line would then be attached to the conductor or shield wire to pull it through the sheaves into its final location. Pulling the pilot line may be accomplished by attaching it to a specialized vehicle or to a small helicopter that moves along the ROW.

Pulling and tensioning equipment would use a hard line to install the ground wires and achieve the correct sagging of the transmission lines between support structures. Pulling and tensioning sites would be required about every 3 miles along the ROW and would encompass approximately 2.3 to 2.8 acres to accommodate required equipment. Equipment at sites required for pulling and tensioning activities would include tractors and trailers with spooled reels that hold the conductors, and trucks with tensioning equipment. To the extent practicable, pulling and tensioning sites would be located within the ROW; any pulling and tensioning sites on Federal lands outside the ROW would require a temporary ROW authorization from the BLM. Depending on the topography, minor grading may be required at some sites to create level pads for equipment. Wire splicing sites would be located midway between each pair of pulling/tensioning sites. Finally, the tension and sag of the conductors and shield wires would be fine-tuned, the conductors would be permanently attached to the insulators at the support structures, and the stringing sheaves would be removed.

Short-term disturbance work areas for conductor, ground wire, OPGW pulling, and snubbing sites would also be required. During stringing operations, approximately 2 to 3 drums of cable can be pulled and spliced together; pulling stations would be required every 5 to 7 miles along the transmission line route. For large angles, these pulling sites may extend beyond the ROW. Pulling sites would be approximately 600 feet by 200 feet in size (2.8 acres). Snubbing sites (where a conductor is temporarily fixed or attached to the ground for conductor-sagging purposes) would be located within the ROW and are locations where conductors are spliced together approximately every 5 to 7 miles along the transmission line route. Access to both sites would be required for necessary equipment. Table 2.2-7 presents the estimated short-term disturbance associated with wire stringing.

In the Copper Bottom Pass area, puller/tensioner and snub sites, if possible, would be deemed drive and crush with the utilization of a soil compactor to reach compaction necessary for heavy equipment to travel sufficiently without risk of roll over, spinning out, or rutting. In instances where drive and crush disturbance cannot reach a level enough plane for the stated heavy equipment necessary, then blading would have to occur in order to keep pullers, tensioners, and wire boats level for efficient and safe wire conducting activities. All blading associated with puller/tensioner and snub sites would be temporary.

All wire pulling operations at the Colorado River crossing would comply with the stipulations provided in the USACE Clean Water Act Section 404 Permit and USACE Rivers and Harbors Act Section 10 Permit. DCRT and/or their contractor would make all reasonable efforts to communicate with the US Coast Guard, local marinas, commercial boat launches, and local recreational clubs and provide advanced notice of crossing operations. To protect the public, all boat traffic would be restricted from entering the wire pulling area while stringing operations (i.e., stringing of sock line, pulling back of hard line, and stringing of conductor/OPGW) are occurring. Boat traffic may be restricted using a combination of patrol boats and warning buoys on either side of the wire pulling corridor. These restrictions would be temporary in nature and boat traffic would be allowed to resume after each wire stringing subactivity (i.e., sock line stringing, hard line pull back, conductor/ OPGW stringing) was completed.

Restrictions in access to the upland areas adjacent to the Colorado River would be implemented to maintain public safety during construction operations and would be temporary in duration. Signage advising recreation users of construction activities and directing them to alternative trails or bikeways would be installed.

All short-term disturbance areas would be reclaimed as described in the Habitat Restoration and Monitoring Plan (Appendix 2B).

Table 2.2-7 Short-term Disturbance Associated with the Wire Stringing under the Proposed Action by Segment

SEGMENT	LINE MILES	SNUBBING SITE DISTURBANCE (ACRES)*	PULLING SITE DISTURBANCE (ACRES)*	TOTAL SHORT-TERM DISTURBANCE (ACRES)
Arizona				
p-01	26.7	16.5	25.8	42.3
p-02	1.0	0	0	0
p-03	2.1	2.8	2.3	5.1
p-04	5.5	5.5	4.6	10.1
p-05	2.0	2.8	2.3	5.1
p-06	35.7	24.8	23.0	47.8
p-07	2.2	0.0	3.7	3.7
p-08	0.6	0.0	0.0	0
p-09	6.9	5.5	0	5.5
p-10	1.1	0	0	0
p-11	4.1	2.8	2.3	5.1
p-12	2.5	0	0.0	0
p-13	3.5	0.0	2.3	2.3
p-14	0.9	0.0	2.3	2.3
p-15e	2.8	0	7.9	7.9
SCS Dist. Line*	0.2	0.0	0	0
California				
p-15w	6.6	5.5	1.4	6.9
p-16	4.6	2.8	5.7	8.5
p-17	3.1	0	4.6	4.6
p-18	2.4	2.8	11.5	14.3
Total	114.3	71.8	99.7	171.5

Assumptions:
Snubbing sites estimated at 2.8 acres of disturbance each located 5 miles apart along the line.
Pulling sites estimated at 2.8 acres of disturbance each at dead-end and 2.3 acres of disturbance at angles located at 5 miles apart along the line.
*Wire stringing for new distribution line associated with the SCS would be accomplished within other estimated disturbance; no additional disturbance estimate required. Line miles for distribution line not included in transmission line mileage total.

Installation of Infrastructure Associated with Induced Current

Gradient Control Wires

If additional gradient control wires are needed, they would most likely be located in the existing pipeline ROW. An electrical study would be conducted prior to initiation of construction activities when the proximity of the representative ROW to existing pipelines is known. This study would determine the extent and type of anti-corrosion measures that would be required. The gradient wires that may be required could be installed either by trenching, ripping, or a combination of both. Disturbance estimates and any requirements for temporary ROWs on Federal lands would be disclosed.

Distribution Supply Lines for Cathodic Protection

An induction study would be completed for parallel facilities, such as pipelines, that would be affected by the Project. Typically, a distribution supply line is needed to provide power for the compensation stations, fiber optic repeater stations, and cathodic protection equipment. The need for and locations of any new distribution lines would be determined as part of the induction study and related disturbance would be estimated.

There are two different ways to provide cathodic protection; galvanic and impressed current. This would be determined as part of the study to select the most operationally and cost-effective way to protect the facilities being used. Using a distribution line is just one method (impressed current) and used if existing facilities are available. If distribution lines aren't available where needed, other methods would be researched and used if feasible.

Guard Crossings

Temporary clearance structures called guard structures would be erected over highways, transmission lines, structures, waterways, and other obstacles prior to conductor stringing. The guard structures are typically vertical 16- to 24-inch diameter wood poles with cross arms, on a 2 x H-frame configuration (Appendix 1, Figure 2.2-8), and are erected at road crossings or crossings with other energized electric and communication lines to prevent contact during stringing activities. Bucket trucks may also be used to provide temporary clearance. Two crossing guard structures are required per crossing, one on each side.

All guard structures would be located within the Project ROW. The short-term disturbance associated within installation of guard structures would consist of a 50- by 200-foot work area at the base of each structure and three holes approximately 2 feet in diameter, with a total of 10,000 square feet (0.23-acre) of short-term disturbance per each side of crossing. The installation method of the guard structures would be direct embedding with crushed rock and excavated material. All excavated material for the guard structures would be used to backfill these guard structures. As such, no excavated material would require offsite removal. All topsoil would be salvaged, stockpiled, and replaced on removal of the guard structures and initiation of reclamation activities.

A summary of the number and type of crossings and the associated guard structure disturbance by segment is provided in Table 2.2-8.

Table 2.2-8 Summary of Guard Crossings Short-term Disturbance by Proposed Action Segment

SEGMENT	ELECTRICAL CROSSINGS	ROAD AND WATER CROSSINGS	TOTAL IMPACT* (ACRES)
Arizona			
p-01	2	21	10.6
p-02	0	0	0.0
p-03	0	0	0.0
p-04	1	4	1.4
p-05	0	1	0.5
p-06	1	7	3.7
p-07	1	2	1.4
p-08	1	1	0.5
p-09	0	1	0.5
p-10	0	1	0.9
p-11	0	0	0
p-12	0	6	2.3
p-13	0	5	2.8
p-14	0	1	0.5
p-15e	0	1	1.4
California			
p-15w	4	17	7.3
p-16	1	6	7.6
p-17	3	0	0.9
p-18	1	0	0.5
Total	15	75	42.8

* Includes disturbance on each side of the crossing.

Temporary Use Areas

Material staging and laydown yards would be strategically located along the Proposed Action route, with a total maximum disturbance of 34.5 acres. An average of one material staging/crew show-up area per 20 line-miles is planned for the Project, currently identified in Tonopah, Quartzsite, Salome, and Blythe. Material laydown areas, not to exceed four, would be within the ROW or adjacent. Locations for temporary use areas would be identified in the final POD and would generally be located on previously disturbed lands or in areas that are identified as minimizing environmental impacts. In some locations, only minimal site preparation would be required for material staging, laydown yards, and batch plant locations. Some areas may need to be scraped, which involves removing the top 6 inches of topsoil, by bulldozer, and adding a layer of rock or compacting the dirt and/or applying dust palliatives/tackifier to provide an all-weather surface. It is likely that not all staging areas would be active at the same time. Construction would occur in a sequential manner with access crews, foundation crews, structure erection crews, stringing crews, and cleanup crews working in order throughout the Project. Quick road access is preferred for location selection.

Concrete batch plants would be colocated with material storage/laydown areas. A crane would be used to set the batch plant equipment. If a batch plant is needed outside of planned material storage yards, an area of approximately 5 acres would be required. For purposes of disturbance estimates, material staging, material storage, and laydown areas are synonymous. The existing 500kV switchyards at the Delaney and Colorado River substations were designed and constructed to accommodate multiple transmission lines and generation interconnections, and as such there would not be an expansion to the existing substation acreage or to the existing 500kV buses. No new disturbance would occur outside of the substation property boundaries.

These areas would be used only during construction and reclaimed following completion of construction as described in the Habitat Restoration and Monitoring Plan (Appendix 2B). The sites would be returned to their original contour and stockpiled topsoil would be spread on the surface. Vegetation reclamation would be designed and implemented with the goal to return the short-term disturbance areas to their pre-existing conditions to the extent practicable, given the desert environmental conditions.

To the extent practicable, temporary use areas would be located in previously disturbed areas to minimize impacts to the environment. A Stormwater Pollution Prevention Plan (SWPPP) would provide detailed, site-specific steps to minimize construction impacts to the natural environment.

<u>Disposal and Cleanup</u>

Construction would generate non-hazardous solid wastes, including material packaging, concrete, hardware and scrap metal. However, the volume of these wastes is not expected to be substantial. Personal trash would be removed from the ROW on a daily basis. Construction waste (boxes, crates, etc.) would be removed from the transmission ROW shortly after each crew completes their specific task on site. The solid wastes generated during construction would be hauled away for recycling or disposal at approved disposal sites. Approximately 10 dumpsters per month would be generated at each active staging site.

2.2.7.3 Construction Reclamation

<u>Cleanup</u>

Construction sites, material storage, laydown yards, batch plants, and access roads would be kept in an orderly condition throughout the construction period in conformance with the Waste Management Plan for the Project (to be included in the final POD prior to issuing the NTP). Refuse and trash, including stakes and flagging, would be removed from the work areas and disposed of in local permitted landfills in accordance with local ordinances. There would be no open burning or on-site disposal of construction trash at any time during the life of the Project. Once the cleanup crew has completed a section of line, the staging area serving that portion of the line would be decommissioned and fencing around storage yards would be removed.

<u>Soil Stabilization</u>

Ruts and holes due to construction activities would be regraded. Disturbed surfaces would be reclaimed to as near the original contour of the land surface as possible. Permitted water diversions would be constructed along the ROW, as needed, to control surface water and minimize soil erosion. Temporary construction roads, not required for future maintenance access, would be reclaimed after construction of the Project is complete. For example, access roads to staging areas would not be required once the staging area is regraded and vegetated. Areas of soil compaction, including temporary roads and reclaimed existing roads, would be scarified as prescribed in the Habitat Restoration and Monitoring Plan (Appendix 2B). Unless directed by the landowner, the rock placed on temporary use areas (material staging, laydown, and batch plant locations, for example) would be removed from the staging area upon completion of construction, and the area reclaimed. A number of BMPs for soil stabilization would be implemented in disturbed areas. Possible stabilization methods may include reseeding, contouring of the land surface, use of water control and diversion techniques, compacting or de-compacting of underlying soil if appropriate, sediment control devices and rolled erosion control systems because they are typically sold in rolls for ease of storage and installation and others. A detailed assessment of available stabilization procedures and technologies is included in the Habitat Restoration and Monitoring Plan for the Project.

Revegetation

Appropriate site-specific seed mixes for revegetation would be used for varying site conditions and would be specified in the Habitat Restoration and Monitoring Plan (Appendix 2B). Salvaged native plants would be used for revegetation, if appropriate, along with seeding using BLM-recommended and approved seed mixes. Preferably, seeding would occur during the months from November to January following transmission line construction. Specific details for revegetation activities would be described in the approved POD or within the Habitat Restoration and Monitoring Plan prepared for this Project. Part of the Habitat Restoration and Monitoring Plan would be the inclusion of specific success criteria that must be met to demonstrate compliance with vegetation requirements. Water requirements for revegetation would be estimated in conjunction with preparation of the Habitat Restoration and Monitoring Plan.

DCRT would adhere to Arizona's Native Plant Law, and any California legal requirements, and would work with the applicable jurisdictions to implement reclamation and reseeding of construction-disturbed areas sites, in accordance with BLM, state, and local requirements. Plants would be salvaged on state trust lands, while safeguarded and salvage restricted (SR) plants protected by the Arizona Native Plant Law would likely be salvaged on BLM and private lands, pending a decision by the BLM in accordance with the Habitat Restoration and Monitoring Plan (Appendix 2B). All plant material not salvaged could either be broken up to potentially aid in revegetation efforts and/or completely removed from the area and disposed of at an appropriate disposal facility in compliance with the Vegetation Management Plan (Appendix 2B, Section 2B.11) for the Project.

2.2.7.4 Construction Workforce and Schedule

The estimated number of workers and types of equipment required to construct the proposed transmission line are shown in Table 2.2-9 and are subject to adjustment as Project planning evolves. The estimated number of workers and types of equipment required to construct the SCS are provided in Table 2.2-10. Various phases of construction would occur at different locations throughout the construction process, and in some cases at the same time at different locations. Regular field meetings would be held with the CIC and environmental monitors to coordinate construction activities with monitoring requirements for the transmission line and ancillary facilities.

The transmission line workforce and equipment listed in Table 2.2-9 would also be used for reclamation. The workforce required for reclamation for the SCS is included in Table 2.2-9. Crew parking would be accommodated at a central staging area. Crews would then be sent out to work sites together via carpool. The central location required for crew parking would be located at one of the material storage yards closest to the work area. The most probable locations are Blythe, Quartzsite, Tonopah, and adjacent to the SCS, but the location would depend on the final route selected by the BLM.

Table 2.2-9 Transmission Line Labor Force and Equipment Requirements

ACTIVITY	WORK DAYS	EQUIPMENT TYPE	NUMBER OF EQUIPMENT	STARTING MONTH	DURATION MONTHS*	CREW
Access Road Construction	242	Bulldozers, D6 or D8	2	1	4.5	8
	242	Graders	2	1	4.5	
	242	Backhoe	2	1	4.5	
	484	2-ton truck	4	1	4.5	
	121	Skidsteer loader	1	1	4.5	
	121	Mini excavator	1	1	4.5	
	121	Tractor with seeding equipment	1	1	4.5	
	242	Pick-up truck	2	1	4.5	
	242	Water pump	2	1	4.5	
	242	Water truck	2	1	4.5	
Mechanics	1488	Mechanics truck (2-ton)	4	-2	16	4
	1488	Portable Power unit 20kW	4	02	16	
Foundation Installation	602	Track-mounted drill rig	2	1	12	24
	301	Excavator	1	1	12	
	301	Rock Drill Rig	1	1	12	
	301	2-axle Lo-Boy Trailer	1	1	12	
	602	Wagon drills	2	1	12	
	301	40-ton Crane	1	1	12	
	602	Portable Power Unit 20kW	2	1	12	
	602	High Pressure Grout Plant Colloidal Mixer	2	1	12	
	602	Air Compressor 185 cfm	2	1	12	
	602	Backhoe	2	1	12	
	1806	Pick-up truck	6	1	12	
	602	Boom truck 33-35T	2	1	12	
	602	Concrete truck	2	1	12	
	602	Water truck	2	1	12	
	1204	Telehandler Forklift	4	1	12	
	308	Front-end loader	2	2	7	

ACTIVITY	WORK DAYS	EQUIPMENT TYPE	NUMBER OF EQUIPMENT	STARTING MONTH	DURATION MONTHS*	CREW
	602	Dump truck	2	1	12	
	602	Flatbed/ boom trucks	2	1	12	
	1806	2-ton trucks	4	2	7	
	301	Water truck	1	1	12	
	602	Water pump	2	1	12	
	105	*Chinook CH-47D Helicopter	1	7	3	
Laydown yard/receiving	262	60-ton crane	1	-2	9	8
	524	Forklifts	2	-2	9	
	524	Telehandler Forklift	2	-2	9	
	524	Pick-up Truck	2	-2	9	
Structure hauling	313	Boom truck	1	1	12	4
	626	Flatbed trailers	2	1	12	
	313	Forklift	1	1	12	
	313	Pick-up truck	1	1	12	
Structure assembly	1565	2-ton Truck	5	1	12	20
	1252	Pick-up truck	4	1	12	
	1252	Telehandler Forklift	4	1	12	
	626	40-ton crane	2	1	12	
	626	Air Compressor 185 cfm	2	1	12	
	626	Portable Power unit 20kW	2	1	12	
	313	Water truck	1	1	12	
	313	Water pump	1	1	12	
Structure erection	626	100-ton cranes	2	1	12	20
	1252	Boom truck 33-35T	4	1	12	
	1565	2-ton trucks	5	1	12	
	1565	Pick-up truck	5	1	12	
	313	275 Ton Crane	1	1	12	
	313	Air Compressor 185 cfm	1	1	12	
	626	Telehandler Forklift	2	1	12	
	70	*Chinook CH-47D Helicopter	1	9	2	
Wire Stringing	750	Drum puller	5	6	7	
	732	Haul trailers	4	6	7	
	300	Tensioners	2	6	7	
	242	D8 Cat/dozer/winch	2	6	7	
	300	Splicing truck	2	6	7	
	549	Portable Power Unit 20kW	3	6	7	

ACTIVITY	WORK DAYS	EQUIPMENT TYPE	NUMBER OF EQUIPMENT	STARTING MONTH	DURATION MONTHS*	CREW
Wire Stringing Cont.	366	Digger Derrick	2	6	7	34
	183	100-ton Crane	1	6	7	
	549	Flatbed trailers	3	6	7	
	732	55-ton Crane	4	6	7	
	450	Morpac Spacer Carts	3	6	7	
	366	Front-end Loader	2	6	7	
	1098	Telehandler Forklift	6	6	7	
	366	Backhoe	2	6	7	
	732	Air Compressor 185 cfm	4	6	7	
	366	100-ft bucket truck	2	6	7	
	1098	2-ton truck	6	6	7	
	366	40-ton cranes	2	6	7	
	1098	Boom truck 33-35T	6	6	7	
	440	2-ton winch trucks	6	6	7	
	300	Splicing truck	2	6	7	
	183	Water pump	1	6	7	
	183	Water truck	1	6	7	
	1464	Pick-up truck	8	6	7	
	121	*MD-500D (369D) Helicopter	1	6	7	
Road/ROW Restoration	115	Bulldozers D8	1	8	6	8
	115	Excavator	1	8	6	
	230	Water Pump	2	8	6	
	115	Tractor with seeding equipment	1	8	6	
	115	Grader	1	8	6	
	345	2-ton truck	3	8	6	
	115	Mini excavator	1	8	6	
	115	Skidsteer loader	1	8	6	
	230	Backhoe	2	8	6	
	345	Pick-up truck	3	8	6	
	115	Dump truck	1	8	6	
	230	Water Pump	2	8	6	
	230	Water truck	2	8	6	
Clean up/ Reclamation	30	Flatbed truck with bucket	1	13	1	4
	60	Pick-up truck	2	13	1	

*Number of months during which this activity may occur, as work days may not be consecutive.
Note: these labor force and equipment lists represent approximate requirements.

The information provided in Table 2.2-10 is for one work front. All the following activities would operate in up to two work fronts simultaneously. Equipment trip estimates for construction and reclamation are provided in Table 2.2-11.

Table 2.2-10 SCS Labor Force and Equipment Requirements

ACTIVITY	WORK DAYS	EQUIPMENT TYPE	NUMBER OF EQUIPMENT	STARTING MONTH	DURATION MONTHS	CREW
Site Grading & Surfacing	50	CAT 623 Scraper	1	4	2	4
	50	CAT 140H Blade	1	4	2	
	50	Mid-size Dozer	1	4	2	
	100	2-ton truck	2	4	2	
	100	Pick-up truck	2	4	2	
	50	Sheepfoot roller	1	4	2	
	50	Smooth Drum Roller	1	4	2	
	50	Walk behind roller	1	4	2	
	50	CAT 950 Loader	1	4	2	
	50	30-ton Excavator	1	4	2	
	70	Track Mounted Drill Rig	1	6	2.5	
	140	Backhoe	2	6	2.5	
	70	Concrete truck	1	6	2.5	
	70	40-ton Crane	1	6	2.5	
	70	Telehandler Forklift	1	6	2.5	
	70	Air Compressor 185 cfm	1	6	2.5	
SCS Equipment Install & Steel Erection	80	Mini Excavator	1	8.5	6.5	10
	80	Backhoe	1	8.5	6.5	
	80	2-ton Truck	1	8.5	6.5	
	240	2-ton Truck	2	8.5	6.5	
	80	Pick-up Truck	1	8.5	6.5	
	240	Pick-up Truck	2	8.5	6.5	
	120	40-foot manlifts	1	8.5	6.5	
	120	60-foot manlifts	1	8.5	6.5	
	120	90-foot manlift	1	8.5	6.5	
	100	Skidsteer loader	1	8.5	6.5	
	80	Trencher	1	8.5	6.5	
	20	60-ton Crane	1	8.5	6.5	
	240	5-ton forklifts	2	8.5	6.5	

Table 2.2-11 Equipment Transportation Estimates

ACTIVITY	SUBACTIVITY	MONTH STARTING	DURING MONTHS	VEHICLE/ TRUCK TYPE	TOTAL NUMBER OF LOADS	TOTAL MILES	NUMBER OF TRUCKS/ VEHICLES REQUIRED
Foundation installation	Concrete transport from batch plant to site	1	12	Concrete truck	2,837	35,464	5
	Aggregates transport from quarry to batch plants	1	12	Dump truck	911	119,901	3
	Water transport from well to batch plants	1	12	Water truck	553	72,784	1
	Rebar/anchor bolt transport from material storage to site	1	12	Flatbed Trailer	323	4,038	1
	Guyed V grout and precast pedestal transport from material storage to site	1	12	Flatbed Trailer	107	1,338	1
Access roads	Aggregates transport from quarry to roads	1	4.5	Dump truck	4,237	557,592	28
Dust control	Water from well to roads	1	18	Water truck	22,587	2,972,461	2
Material procurement and transport	Rebar/anchor bolt transport from factory to material storage	1	12	Flatbed Trailer	323	419,900	2
	Guyed V grout and precast pedestal transport from factory to material storage	1	12	Flatbed Trailer	107	139,100	2
	Structure transport from factory to material storage	1	3	40-foot container truck	276	689,232	26
	Conductor from factory to material storage	4	3		194	678,211	25
	OPGW and extra high strength guy strand from factory to material storage	4	1		8	29,732	3
	Insulators from factory to material storage	3	1		4	9,497	1
	Fittings, grounding, spares from manufacturer to material storage/site	10	2		14	34,462	2
	Substation material	4	8		20	2,000	1

ACTIVITY	SUBACTIVITY	MONTH STARTING	DURING MONTHS	VEHICLE/ TRUCK TYPE	TOTAL NUMBER OF LOADS	TOTAL MILES	NUMBER OF TRUCKS/ VEHICLES REQUIRED
Structure hauling	Structures from material storage to site	5	7	Flatbed trailer	551	6,888	2
Wire stringing	Conductor and OPGW from material storage to site	12	5	Wire reel trailer	405	5,057	2
ROW Survey	Workers daily commute	1	1	Pick-up truck	42	3,360	2
Access road construction		1	5		420	33,600	2
Foundation installation		2	7		1764	141,120	12
Structure hauling		6	8		336	26,880	2
Structure assembly		6	8		1344	107,520	8
Wire stringing		12	5		1050	84,000	10
Road/ROW reclamation		15	3		252	20,160	4
Clean up/Reclamation		15	3		252	20,160	4
Substation construction		6	12		2520	126,000	10

Schedule

DCRT would commence construction upon receipt of necessary permits and ROW approvals. Table 2.2-12 below outlines the construction task, phase, and anticipated duration.

Table 2.2-12 Construction Schedule

TASK/PHASE	DURATION (DAYS)
TRANSMISSION AND DISTRIBUTION LINE CONSTRUCTION	**934**
Project Execution Plan	11
Design and Engineering	428
Procurement	229
Construction Mobilization and Recruitment	15
Access Road construction	128
Foundations	365
Structure Erection and Assembly	363
Wire Stringing and Installation of Cables and Accessories	213
Commissioning and Testing	57
SERIES COMPENSATION STATION & SUBSTATION CONSTRUCTION	**431**
Procurement	347
Capacitor Bank	33
Protections	109
Civil Works	37
Erection and Assembly Works	33
Install Control Building and Equipment	70
Commissioning and Testing	37

Project Construction Closeout

Upon completion of construction and commissioning for the Project, DCRT and the construction contractor(s) would coordinate with the CIC and BLM Authorized Officer and resource staff to conduct final on-the-ground inspections of Project conditions. Inspections would be conducted to ensure work was completed in accordance with the terms and conditions of the ROW grant, ROD, POD, and any other applicable permits. When the BLM Authorized Officer determines that construction (including initial reclamation activities) has been completed in compliance with the ROW grant, ROD, POD, and any other applicable permits, the CIC, construction contractor(s), and DCRT's construction roles would be considered complete. This determination would initiate the post-construction monitoring phase for reclamation success for which DCRT would remain responsible.

After BLM's determination of successful construction completion, the CIC would submit a final summary report to the BLM Authorized Officer documenting the construction process and activities including, but not limited to, the following items:

- amount of actual temporary and permanent Project disturbance (acres) as compared with the POD
- compilation of weekly summary compliance reports (including digital pictures)
- variance requests and corresponding CIC/BLM decisions
- temporary work suspensions and work stoppage orders for violation of environmental requirements
- compliance terms and documentation of resolution
- environmental training roster

2.2.7.5 Construction Water Requirements

Water would be required for concrete structure foundation construction at the batch plants and dust control throughout the construction phase of the Project. Water would be obtained from private wells and/or municipal supplies with permitted and allocated water rights. Estimated water quantities are provided in Tables 2.2-13 and 2.2-14.

Table 2.2-13 Foundation Details and Construction Water Requirements

STRUCTURE TYPE	CONCRETE PER PIER (CY)	NO. OF PIERS PER STRUCTURE	CONCRETE PER STRUCTURE (CY)	WATER PER STRUCTURE (GALLONS)	NO. OF STRUCTURES	TOTAL CONCRETE (CY)	TOTAL WATER (GALLONS)
Guyed V Structure (Tangent) Foundation	6.3*	4	25.1*	879.7	174	4,367.4	153,067.8
H Frame (Tangent) Foundation	6.5	8	52.4	1,832.6	38	1,991.2	69,638.8
Self-supporting Lattice Tangent Structure Foundation	39.8	4	70.7	2,476.0	138	9,756.6	341,688
Self-supporting Lattice Dead-end Structure Foundation	39.8	4	159.2	5,571.1	37	5,890.4	206,130.7
Monopole	70.7	1	70.7	2,476.0	0	0	0
Snubbing Sites	7.0	3	21.0	733.0	26	546.0	19,058.0
SCS Foundations	6.5	1	6.5	229.1	60	390.0	13,746.0
Substation Dead Ends	39.8	4	159.2	5,571.1	1	159.2	5,571.1
Substation Component Foundations	6.5	4	26.2	916.3	4	104.8	3,665.2
TOTAL						23,205.6	812,565.6

Note: No water would be required for construction of the SCS distribution line.

*Guy wire anchors would use grout not concrete; this entry captures the amount of grout and water required for guy wire anchors.

Table 2.2-14 Construction Water Requirements for the Proposed Action

SEGMENT	LINE MILES	TOTAL STRUCTURES	TOTAL SNUBBING SITES	STRUCTURES* & SNUBBING (GALLONS)	DUST CONTROL (GALLONS)	TOTAL (GALLONS)*
Arizona						
p-01	26.7	88	6	289,028.2	33,701,021.1	33,990,049.3
p-02	1.0	4	0	9,852.2	252,442,1	262,294.4
p-03	2.1	6	1	7,213.5	530,128.4	537,341.9
p-04	5.5	15	2	23,223.6	1,388,431.6	1,411,655.2
p-05	2.0	9	1	10,380.4	504,884.2	515,264.6
p-06	35.6	120	9	226,584.1	9,012,183.2	9,238,767.2
p-07	2.2	7	0	18,648.8	530,128.4	548,777.3
p-08	0.6	2	0	2,111.3	151,465.3	153,576.5
p-09	6.9	23	2	48,674.7	1,741,850.5	1,790, 525.3
p-10	1.1	5	0	14,856	277,686.3	292,542.3
p-11	4.1	14	1	46,190.6	1,035,012.6	1,081,203.2
p-12	2.5	8	0	15,990.4	631,105.3	647,095.6
p-13	3.5	10	0	16,186.1	883,547.4	899,733.5
p-14	0.9	3	0	8,913.6	227,197.9	236,111.5
p-15e	2.8	10	0	40,854.4	706,837.9	747,692.3
California						
p-15w	6.6	24	2	55,310.3	1,666,117.9	1,721,428.2
p-16	4.6	18	1	42,780.1	1,161,233.7	1,204,013.7
p-17	3.1	12	2	41,127.8	782,570.5	823,698.3
p-18	2.4	10	1	38,019.9	605,861.1	643,880.9
Other						
Substations	N/A	60**	N/A	16,493.4	N/A	16,493.4
SCS & Substation Foundations	N/A	4**	N/A	4,398.2	N/A	4,398.2
Total	114.3	421	28	976,837.4	55,789,705.3	56,766,542.6

N/A - not applicable
* Guyed V foundations would be precast; however, grout for guyed V anchors represented here.
**Not included in transmission line structure total as these are equipment foundations.
Assume the water per structure values provided in Table 2.2-13.
Dust control estimated at 1,051,842 gallons per mile in Maricopa County and 210,368.4 gallons per mile in all other parts of the Project, average.
No water would be required for construction of the SCS distribution line.

2.2.7.6 Estimated Disturbance Summary

Tables 2.2-15 and 2.2-16 summarize the total disturbance acreages for the Proposed Action and the Proposed Action by segment, respectively.

Table 2.2-15 Summary of Short-term and Long-term Disturbance under the Proposed Action

COMPONENT	SHORT-TERM[1] DISTURBANCE (ACRES)	LONG-TERM DISTURBANCE (ACRES)	TOTAL DISTURBANCE (ACRES)
Access Roads	0	375.2	375.2
Material Staging, Laydown, and Batch Plant Areas	34.5	0	34.5
Fly Yards	33.4		33.4
Structure Foundations and Erection	426.8	33.1	*426.8
Wire Stringing (snubbing and pulling sites)	171.5	0	171.5
Crossings (roads, transmission/power lines, water)	42.8	0	42.8
Series Compensation Station	0	1.7	1.7
Substation Upgrades	0	0	0
Distribution Line	<0.1	<0.1	<0.1
Total	**709.1**	**410.0**	***1,086.0**

[1] Short-term use areas would be located in conformance with BMP-MISC-094, disturbed during construction, their use would be temporary, and the acreage reclaimed; however, due to the desert environment, the disturbance effects may be long term.

*Long-term foundation disturbance would be within and a subset of the short-term disturbance; therefore, it is not additive to the short-term disturbance in totals.

Table 2.2-16 Short-term and Long-term Disturbance by Proposed Action Segment

LONG-TERM DISTURBANCE (ACRES)						SHORT-TERM[1] DISTURBANCE (ACRES)					
SEGMENT	LINE MILES	SCS	ACCESS ROADS	STRUC-TURES	TOTAL LONG-TERM DISTURBANCE	STRUC-TURES	MATERIAL STAGING AREA	HELI-COPTER STAGING	GUARD CROSSINGS	SNUBBING AND PULLING SITES	TOTAL SHORT-TERM DISTURBANCE
Arizona											
p-01	26.7	-	57.7	10.1	67.8	96.8	-	-	10.6	42.3	149.7
p-02	1.0	-	3.3	0.3	3.6	4.4	-	-	0	0	4.4
p-03	2.1	-	6.8	0.4	7.2	6.6	-	-	0	5.1	11.7
p-04	5.5	-	18.1	1.0	19.0	16.5	-	-	1.4	10.1	28.0
p-05	2.0	-	6.5	0.5	7.0	9.9	-	-	0.5	5.1	15.5
p-06	35.7	1.7	117	8.1	125.1	132.0	-	-	3.7	47.8	183.5
p-07	2.2	-	10.1	0.5	10.6	7.7	-	-	1.4	3.7	12.8
p-08	0.6	-	4.5	0.1	4.0	2.2	-	-	0.5	0	2.7
p-09	6.9	-	21.4	1.7	23.1	25.3	-	5.8	0.5	5.5	37.1
p-10	1.1	-	13.1	0.6	13.7	5.5	-	7.6	0.9	0	14.0
p-11	4.1	-	32.4	1.6	34.0	15.4	-	20.0	0	5.1	40.5
p-12	2.5	-	17.6	0.6	18.2	8.8	-	-	2.3	0	11.1
p-13	3.5	-	18.6	0.7	19.2	11.0	-	-	2.8	2.3	16.1
p-14	0.9	-	5.3	0.3	4.5	3.3	-	-	0.5	2.3	6.1
p-15e	2.8	-	15.7	1.2	16.8	11.0	-	-	1.4	6.9	20.3
California											
p-15w	6.6	-	4.3	1.7	6.0	26.4	-	-	7.3	7.8	41.5
p-16	4.6	-	6.2	1.4	7.6	19.8	-	-	7.6	8.5	35.9
p-17	3.1	-	9.6	1.4	11.0	13.2	-	-	0.9	4.6	18.7
p-18	2.4	-	8.7	1.2	9.8	11.0	-	-	0.5	14.3	25.8

LONG-TERM DISTURBANCE (ACRES)						SHORT-TERM[1] DISTURBANCE (ACRES)					
SEGMENT	LINE MILES	SCS	ACCESS ROADS	STRUC-TURES	TOTAL LONG-TERM DISTURBANCE	STRUC-TURES	MATERIAL STAGING AREA	HELI-COPTER S T A G I N G	GUARD CROSSINGS	SNUBBING AND PULLING SITES	TOTAL SHORT-TERM DISTURBANCE
Other											
SCS Dist. Line	0.2	-	-	0.0	0.0	<0.1	-	-	-	-	<0.1
Material Staging/ Laydown Areas[2]	-	-	-	-	-	-	34.5	-	-	-	34.5
Total	114.3	1.7	375.2	33.1	410.0	426.8	34.5	33.4	42.8	171.5	709.1

[1] Short-term use areas would be disturbed during construction, their use would be temporary, and the acreage reclaimed; however, due to the desert environment, the disturbance effects may be long term.

[2]Up to four Material Staging and Laydown areas for a maximum disturbance of 34.5 acres.

2.2.8 Project Operation and Maintenance

The anticipated operations and maintenance duration is 50 years.

The NESC (American National Standards Institute [ANSI] C2), which governs the design and operation of high-voltage electric utility systems, obligates the applicant to maintain reliable operation of the electrical system. The design, operation, and maintenance of the Project would meet or exceed applicable criteria and requirements outlined by NESC, Federal Energy Regulatory Commission (FERC), Western Electricity Coordinating Council (WECC), APLIC recommendations, and US Department of Labor Occupational Safety and Health Standards for the safety and protection of landowners, their property, and the general public.

In 2005, Congress passed the Energy Policy Act of 2005, which provided a regulatory basis for implementing specific incentives (and penalties) for maintaining reliable service, among other issues. As a result of the passage of the Energy Policy Act of 2005, FERC selected NERC to act as the enforcement agency for compliance with electric utility reliability and operating standards, among other issues. DCRT is required to comply with the various reliability standards promulgated through implementation of NERC policies and procedures. Additionally, DCRT is governed by WECC standards that may be in addition to or more stringent than those put forth by NERC.

2.2.8.1 ROW Safety Requirements

<u>Vegetation</u>

When necessary and approved by the BLM, DCRT would limit the height of vegetation along the ROW according to minimum conductor clearances required for the Project (see *Vegetation Management* section). Where vegetation presents a potential hazard, trees would be trimmed or cut to prevent accidental grounding contact with conductors. The transmission line would be protected with power circuit breakers and line relay protection equipment. If a conductor failure occurs, power would be automatically removed from the line. Lightning protection would be provided by ground wires and OPGW on top of the structures.

<u>Building and Fence Grounding</u>

To mitigate possible electric shock caused by electrostatic and electromagnetic induction, all buildings, fences, center pivot irrigation systems, and other structures with metal surfaces within 150 feet of the centerline of the ROW would be grounded to the mutual satisfaction of the parties involved. Typically, residential buildings more than 150 feet from the centerline would not require grounding. Other buildings or structures beyond 150 feet from the centerline would be reviewed in accordance with the NESC to determine grounding requirements. All metal irrigation systems and fences that parallel the transmission line for distances of 500 feet or more, within 150 feet of the centerline, would be grounded (none identified at this time). All fences that cross under the transmission line would also need to be grounded. This procedure would be included in the construction specifications and, if grounding is required outside the ROW, temporary use permits or landowner consent would be obtained, as necessary.

2.2.8.2 Inspections and Maintenance

Regular inspection of transmission lines, substations, distribution lines, and support systems is critical for the Project's safe, efficient, and economical operation. Operation and maintenance activities would include transmission line patrols, annual inspections, structure and wire maintenance, and repairs of access roads.

<u>Transmission Line Maintenance</u>

The transmission lines would be inspected annually or as required by using fixed-wing aircraft, helicopters, ground vehicles, all-terrain vehicles, or on foot. The transmission lines and substations would be inspected for corrosion, equipment misalignment, loose fittings, vandalism, and other mechanical problems. The need for vegetation management would also be determined during inspection patrols.

Maintenance would be performed as needed. The comfort and safety of land users and local residents would be provided for by limiting noise, dust, and the danger caused by maintenance vehicle traffic. Where access is required for nonemergency maintenance and repairs, the same precautions against ground disturbance that were taken during construction would be followed, and restrictions and MMs applicable during initial construction would be followed in areas of critical biological and cultural resource concern. Any berms or boulders that were in place also would be reclaimed after completion of the maintenance work.

Reclamation procedures following completion of repair work would be similar to those prescribed during construction (Section 2.2.7.3). Damage repair may require the same types of equipment used during construction, including power augers for hole boring, backhoes for excavation, and/or concrete trucks and cranes for structure erection. Other required equipment may include power tensioners, pullers, wire trailers, crawler tractors, and trucks and pickups for hauling materials, tools, and workers. Under certain conditions, a helicopter may be used to haul in material and erect structures or string conductor in those areas where access and/or terrain conditions preclude the use of conventional methods. If structures cannot be accessed by a permanent road, workers may access structures by helicopter, foot, or all-terrain vehicle. Any necessary temporary staging areas outside the ROW would require authorization from the applicable landowner(s). Site and access road disturbances such as ruts created during damage operations would be reclaimed to satisfactory condition using rehabilitation procedures.

A permanent work area at the base of each structure (Table 2.2-5) is required for long-term maintenance. While revegetation would occur in this work area, minimal contouring would be performed. If, during transmission line maintenance and monitoring, it is determined that new or reconstruction activities should be implemented, DCRT would notify BLM, property owners, and/or other regulatory agencies, and obtain proper approvals, as necessary, prior to initiating new or reconstruction.

Dust control during maintenance of the transmission line would be managed the same as during construction.

Vegetation Management

The Vegetation Management Plan (Appendix 2B, Section 2B.11) describes measures needed to control vegetation during operation of the transmission line and at associated facilities. The goal of the Project design would be to design for conductor heights that would eliminate or minimize the need for control of height of vegetation, while assuring the Project would be in conformance with NERC guidelines and in compliance with the Arizona Native Plant Law, and any California legal requirements. Should it be required, the Vegetation Management Plan would specify controls for situations where tall vegetation such as saguaro cacti, ironwood, and paloverde growing under and immediately adjacent to the path of the conductors would need to be trimmed or removed to maintain a safe clearance and to reduce the risk of power outages, fires, and other damage. As a part of the Vegetation Management Plan, a wire zone/border zone approach would be applied (Appendix 1, Figure 2.2-9a), incorporating growth rates of tall vegetation within the Project ROW, as detailed in the Vegetation Management Plan. Extensive vegetation management is only anticipated in discrete areas within the Project Area where fast growing, tall species are present. Where necessary, saguaro cacti and other protected plants that must be removed would be salvaged and relocated in accordance with the Arizona Native Plant Law and the Habitat Restoration and Monitoring Plan (Appendix 2B) for the Project.

The conductor's position in space at any point in time is continuously changing in reaction to a number of different loading variables. Changes in vertical and horizontal conductor positioning are the result of thermal and physical loads applied to the line. Thermal loading is a function of line current and the combination of numerous variables influencing ambient heat dissipation including wind velocity/direction, ambient air temperature and precipitation. Physical loading applied to the conductor affects sag and sway by combining physical factors such as ice and wind loading. The movement of the transmission line conductor due to wind is illustrated in Figure 2.2-9a (Appendix 1) (depending on wind conditions and conductor maximum deflection).

The NESC requires 36.25 feet clearance between the maximum point of conductor sag and the ground. The Minimum Vegetation Clearance Distance (MVCD) required by NERC for a 500kV transmission line is 7.4 feet, at an elevation between 2,000 and 3,000 feet. Winds can blow conductors away from the transmission structures, where the conductor could connect with or arc over to nearby vegetation. The furthest point a conductor could be blown from the transmission structure is the conductor maximum deflection.

The Project would be required to be inspected annually, including the incursion of vegetation growth. Palo Verde are predicted to be the quickest growing large vegetation that could interfere with the conductor, growing an average of 36 inches per year, and could intrude on the Project either vertically or radially. The Wire Security Zone is the distance between the maximum point of conductor sag and vegetation (either vertically or radially). For estimating purposes, the Wire Security Zone would add 9 feet (3 feet for vegetation growth plus a 6-foot buffer) to the MVCD, for a total of 16 feet 5 inches beyond the point of conductor maximum sag or deflection. Therefore, the maximum height of vegetation vertically and radially from the conductors at maximum sag or deflection would be approximately 13 feet 10 inches. Border zone vegetation would be height limited at to 31 feet 7 inches, gradually increasing as the distance to the conductor increases (Appendix 1, Figure 2.2-9b). Vegetation may be required to be treated according to the Vegetation Management Plan (Appendix 2B, Section 2B.11), should design adjustments, micrositing, or other avoidance measures (Appendix 2A, Section 2A.4) not be feasible or fully resolve the situation.

DCRT would comply with agency requirements regarding management of noxious weeds and invasive species within the ROW, along access roads, and at temporary use areas (for example, cleaning equipment to prevent spread of noxious weeds and invasive species), as specified in the Noxious Weed Management Plan (Appendix 2B, Section 2B.11). Chemical treatment within or adjacent to the ROW generally would be limited only to areas with noxious weeds or invasive species, and only if absolutely necessary and in accordance with the Noxious Weed Management Plan. Should the use of herbicides or pesticides be necessary, only BLM-approved products from the approved California herbicide list would be used, and only upon prior approval of the BLM Authorized Officer or owner. A pesticide use proposal (PUP) must be completed by all persons using any chemicals on BLM-administered land. End of year reports must be turned in at the completion of every calendar year. Use of pesticides and herbicides on lands that fall under the CDCA Plan as amended by the DRECP would adhere to the CMAs regulating those activities.

<u>Series Compensation Station Maintenance</u>

The SCS requires minor maintenance once yearly for approximately 3 to 5 days, depending on the tasks required. A crew comprised of up to four electricians and two specialists would perform this work using a man lift.

Maintenance, patrolling, and monitoring of the SCS distribution line would include ground maintenance patrols that would review the line periodically. Routine maintenance would include replacing damaged insulators as needed and tightening nuts and bolts, as well as vegetation maintenance. Access for operation and maintenance would be traveling overland within the ROW or on adjacent roads.

<u>Substation Maintenance</u>

It would be the responsibility of the interconnecting utilities, SCE and APS, to perform maintenance on all equipment associated with the Project inside their respective substations (APS Delaney and SCE Colorado River substations).

Maintenance, patrolling, and monitoring of the rest of the Project, including the SCS, would be the responsibility of DCRT and would be performed on a routine basis in accordance with industry standards and manufacturer guidelines. If a large volume of a contaminant were to leak from a piece of electrical equipment, an automated alert would notify the operations center of the problem. A trained maintenance crew would be dispatched to the substation or SCS immediately to begin repairs and clean up according to all appropriate regulations and procedures.

2.2.8.3 Long-Term Access to the ROW

Authorized access roads would be used only for maintenance purposes upon completion of construction. Where long-term access is required for maintenance and operation and authorized by the BLM or other underlying landowners/managers, DCRT would maintain the ROW in a safe, useable condition. A regular maintenance program may include, but would not be limited to, blading, ditching, culvert installation, and surfacing. Access maintenance would not be initiated prior to obtaining necessary authorization from landowners or land management agencies.

Maintenance vehicles would require access to the ROW once yearly for transmission line inspection. Where the ground is uneven at drainage crossings, special precautions would be taken to ensure equipment blades do not destroy vegetation.

2.2.8.4 Signs and Markers

Warning signs would be placed on structures and at substations, marking high-voltage danger areas in accordance with industry standards.

2.2.8.5 Energy Use During Operations and Maintenance

Strengthening the regional transmission system in Arizona and California by adding additional capacity and alleviating grid congestion would indirectly facilitate increased consumption of energy by meeting increased electricity demand. However, increases in per capita energy use are not expected to result from implementation of the Project. Nevertheless, a direct effect of this grid congestion reduction is that the Project would improve energy reliability. The Project would also facilitate the development of new renewable energy sources. Vehicle trips and equipment use during operation would be minimal and have a negligible impact on energy consumption. Nevertheless, the Project would incorporate measures in maintenance procedures to reduce wasteful energy use during operation as well.

The conductor selected for the Project, and the increase in section allowed by the triple-bundle configuration, would reduce energy losses. ACSR selection allows the use of aluminum, a metal with high conductivity, while steel provides the tensile strength required. Transmission losses are also directly proportional to the square of the power transmitted, and therefore operation of this line in parallel with the DPV1 would allow power to be distributed between both lines, and therefore reducing overall transmission losses for the same amount of power transmitted.

2.2.8.6 Radio or Television Interference

DCRT would respond to complaints of radio or television interference generated by the transmission line by investigating complaints and implementing appropriate MMs, if necessary. The transmission line would be inspected on a regular basis so that damaged insulators or other components that could cause interference are repaired or replaced. These patrols would be the same thing as routine inspections and monitoring, unless a problem is reported; then a special patrol or maintenance might be done to mitigate an issue.

2.2.8.7 Contingency Planning

A representative would be selected by DCRT to provide routine and emergency planning for situations such as power outages, equipment upgrades, and fire control. The designated representative would have the authority to receive and carry out instructions from BLM.

2.2.8.8 Emergency Procedures

In the event of an emergency, crews would be dispatched quickly to repair or replace any damaged equipment. Every attempt would be made to contact the appropriate agencies or landowners along the ROW. In the event notification cannot be made, repair operations would proceed only in the case of an emergency situation with notification occurring within 48 hours after the emergency incident. Reasonable efforts would be made to protect plants, wildlife, and other resources, and minimize ground disturbance.

Emergency response procedures would be implemented for the following potential events or similar events, in conformance with the Emergency Response Plan for the Project (to be provided in conjunction with the final POD prior to the NTP):

- downed transmission lines, damaged structures and/or conductors, or equipment failure
- fires
- sudden loss of power
- natural disasters
- serious personal injury

2.2.8.9 Compatible Uses

After construction, compatible uses in the ROW on public land would be considered and approved (if necessary) by BLM in consultation with DCRT. Examples of compatible uses within the ROW include grazing, vehicle, and pedestrian access to cross under the line, recreational use, and preexisting compatible uses. Examples of uses generally not compatible with high-voltage transmission lines include commercial or residential development and any use that requires changes in surface elevation that affect electrical clearances of existing or planned facilities. Compatible uses of the ROW on Federally managed lands would have to be approved by the appropriate agency. Compatible uses within easements on private land crossed by the transmission line would be similar to those on public land and would be consistent with the terms of the easement.

2.2.9 Termination and Decommissioning

If issued, the term of the BLM ROW grant may allow use of public lands up to 50 years, the projected useful life of the Project. Should the ROW and facilities no longer be needed, the transmission lines and associated facilities would be decommissioned on BLM-managed land. Subsequently, conductors, insulators, concrete pads for the SCS and associated facilities, and hardware would be dismantled and removed from the ROW. Transmission structures would be removed and foundations broken off at least 2 feet below ground surface (bgs). All areas of long-term disturbance on BLM-managed lands would be reclaimed in accordance with a Decommissioning Plan to be included in the final POD.

Access routes and other sites disturbed during decommissioning would be reclaimed and revegetated in accordance with a Decommissioning Plan for BLM-managed lands to be approved by BLM. Implementation of this plan is intended to minimize the impacts of decommissioning activities and ensure that all areas temporarily disturbed during decommissioning are returned to their prior condition. Selected contractors would also be required to develop a SWPPP, which would provide detailed, site-specific steps to minimize impacts to the natural environment. Soil would be de-compacted and sites would be returned to their original contour where possible, salvaged topsoil distributed, and water diversions and other erosion control measures established where necessary. A site-specific mix of native seeds would be planted using BLM-approved methods, and vegetation that had been salvaged and maintained in a nursery would be planted in accordance with the approved Habitat Restoration and Monitoring Plan. Revegetated sites would be monitored periodically to evaluate the effectiveness of erosion control measures, inventory and control weeds, compare the progress of vegetation recovery to predetermined reclamation success criteria, and identify any additional treatment required to achieve those criteria.

One year prior to termination of the ROW, the holder shall contact the BLM Authorized Officer to arrange a joint inspection of the ROW. This inspection would be held to facilitate an acceptable Decommissioning Plan. The BLM Authorized Officer must approve the Plan in writing prior to commencement of any termination activities. The Decommissioning Plan would be reviewed and approved by the BLM Authorized Officer and would include the following information:

- what facilities and access routes are to be removed, reclaimed, and/or rehabilitated;
- how facilities and access routes would be removed and the disturbed areas reclaimed;
- time of year the facilities and access routes would be removed;
- timeline or schedule of removal and reclamation activities;
- stabilization and reclamation techniques to be used during reclamation;
- appropriate BLM approved environmental analysis of the plan;
- criteria that reclamation should meet to be considered complete;
- monitoring of the stabilization and reclamation techniques for an established time period; and
- any environmental stipulations necessary for the protection of sensitive environmental and cultural resource locations

Decommissioning would be a separate undertaking under the National Historic Preservation Act, as stipulated in the draft Programmatic Agreement (PA).

2.2.10 Applicant Proposed Measures and BLM Best Management Practices

Design features for the Project include BMPs, standard operating procedures, applicant proposed measures (APMs), and requirements stated in the RMPs and BLM manuals. These design features would be applied to reduce impacts to special status plant and animal species, reduce dust, reduce visual contrast of the conductors and transmission towers, reduce erosion, reduce spread of noxious weeds.

As a part of their POD, DCRT identified APMs that are included as part of the Proposed Action and all Action Alternatives. Current BLM mitigation policy would be applied to address impacts of the Project that cannot be avoided or minimized to an acceptable level. BLM BMPs would be required to be applied to the Proposed Action and/or Action Alternatives. Project APMs and BMPs are described in Appendix 2A.

The CDCA Plan, as amended, contains CMAs, which include a specific set of avoidance, minimization, and compensation measures. The applicability of those measures to the Project was determined using a CMA checklist (Appendix 2C). Those CMA measures that were determined to be applicable to the Project are included in the Project BMPs, contained in Appendix 2A, and are cross-referenced to the CMA checklist in Appendix 2C.

2.3 NO ACTION ALTERNATIVE

National Environmental Policy Act (NEPA) regulations require the No Action Alternative to be included in the alternatives analysis of an EIS (Council on Environmental Quality [CEQ] Regulation Section 1502.14(d)). The No Action Alternative forms the baseline against which the potential impacts of the Proposed Action and the other Action Alternatives are compared.

Under the No Action Alternative, the BLM would not approve the ROW grant on BLM-administered public lands and none of the BLM RMPs would be amended. The 500kV transmission line would not be constructed across Federal lands as proposed by DCRT.

A decision by the BLM to select a No Action Alternative would preclude DCRT from satisfying their objectives.

2.4 ACTION ALTERNATIVES

Action alternatives consist of individual segments that have been compiled into full Alternative Routes and Subalternatives. Individual segments are the essential building blocks of the full Alternative Routes and Subalternatives.

2.4.1 Issues Driving Project Alternatives

Alternative segments were identified by BLM through a combination of both internal and public scoping. Public scoping comments that resulted in alternative segments being identified included: segments that avoid the Town of Quartzsite, segments within BLM utility corridors, segments that avoid sensitive cultural resources, and segments that avoid Johnson Canyon and the Kofa NWR. Public scoping also raised other potential alternatives that did not result in alternative segments being identified, since the suggested alternative was either not applicable (i.e., the Proposed Action segments already avoided Wilderness Areas [WAs]) or not relevant to the Project (i.e., development of a route and substation for the proposed Brenda Solar Energy Zone). Additional information regarding alternative development and screening is provided in the project record.

2.4.2 Segments

Alternatives to the Proposed Action take the form of assorted segments within the Project Area that could be assembled to form a number of complete routes between the Delaney and Colorado River substations (Appendix 1, Figure 2.4-1). In order to effectively evaluate route alternatives, the Action Alternative routes are divided where route segments intersect. Segments are generally numbered numerically east to west from the APS Delaney Substation to the SCE Colorado River Substation; north-south interconnects are generally numbered from north to south. A total of 45 Action Alternative segments were identified, in addition to the 19 Proposed Action segments in the Project Area. Alternative segments to the Proposed Action segments are identified as follows:

- The APS Delaney Substation segment carries the letter “d”;
- I-10 segments carry the letter “i”;
- The segment north of I-10 carries the letters “in”;

- Segments north of Quartzsite carry the letters “qn”;
- Segments south of Quartzsite carry the letters “qs”;
- Segments through the Copper Bottom Pass area carry the letters “cb”;
- East-west segments in California carry the letters “ca”;
- Cross connectors providing north-south connections roughly between the Proposed Action and east-west alternative segments carry the letter “x”; and
- Segments that break across the Colorado River carry the same segment numbering but are identified as “east” and “west”.

In addition, the route alternative segments were sited to address issues raised by land management agencies, local government, individuals, and organizations.

The following considerations were used to further evaluate alternatives:

- Would the alternative segment meet the underlying Project stated objectives for the proposed Project?
- Is the alternative segment consistent with the policy objectives for the management of the area (e.g., in conformance with land use plans) and if not, would an amendment be required?
- Is the alternative segment substantially similar in design or does it have substantially similar effects as an alternative segment that is already being analyzed?
- Would the alternative segment address and resolve resource conflicts and/or identified issues?
- Would the alternative segment cause fewer adverse environmental effects (fewer detrimental effects, less severe effects, or shorter-term effects) than the proposed route for at least some resources?

Some alternative segments were considered but eliminated from detailed analysis because they do not meet the criteria for a reasonable alternative (listed above).

2.4.3 Zones

The Project Area is divided into four zones (Appendix 1, Figure 2.4-1), where the segments within each zone are geographically similar and could be alternatives to each other:

- East Plains and Kofa Zone
- Quartzsite Zone
- Copper Bottom Zone
- Colorado River and California Zone

Zones were established based on the relationship of alternative segments to each other, geography, common resource issues, and interconnection points. By delineating zones, existing conditions and impacts common to all segments within a zone can be identified and then conditions and impacts specific to each zone and alternative segment can be identified. Alternative segments in a zone are alternatives to each other and can be organized into alternative routes through the zone. Alternative routes (usually made up of more than one segment) in each zone can then be connected with routes in other zones to form complete alternative routes for the Project.

2.4.4 Alternative Segments Carried forward for Detailed Analysis by Zone

Each of the potential alternative segments identified by the BLM for review were evaluated using the following three-step process:

Step 1: Clarify the description of the alternative segment to allow for comparative evaluation.

Step 2: Briefly evaluate the alternative segment by comparing it with the Proposed Action segments and the screening criteria (BLM 2016b).

Step 3: Determine the suitability of each segment for additional data collection based on the results of Step 2. If the alternative is unsuitable, eliminate it from further consideration.

All alternative segments carried forward for detailed analysis were found to meet the underlying Project stated objectives for the Project and to be consistent with the policy objectives for the management of the area. Preliminary screening of alternative segments (BLM 2016b) found that some alternatives carried forward for detailed analysis are substantially similar in design and have substantially similar effects as an alternative segment that is already being analyzed, but may potentially cause fewer adverse environmental effects (fewer detrimental effects, less severe effects, or shorter-term effects) than the proposed route for at least some resources. While many of the alternative segments were determined to address and resolve resources conflicts and/or identified issues, a number of alternative segments are being carried forward for detailed analysis to provide a broad range of available alternatives, should analysis or other factors render some alternative segments infeasible. The following sections present the Proposed Action route segments and Action Alternative Segments being carried forward for detailed analysis by zone.

2.4.4.1 East Plains and Kofa Zone

The East Plains and Kofa Zone (Appendix 1, Figure 2.4-2) includes all segments in the eastern plains and Kofa NWR portion of the Project Area (Table 2.4-1).

Table 2.4-1 Summary of East Plains and Kofa Zone Alternative Segments

SEGMENT	DESCRIPTION	ALTERNATIVE TO	BENEFIT	JURISDICTION MILES	TOTAL LENGTH (MILES)
p-01	See Table 2.2-1				
p-02					
p-03					
p-04					
p-05					
p-06					
d-01	Leaving APS Delaney Substation, goes directly west through Arizona state trust and private land then turns northwest to parallel the Kinder Morgan natural gas line located in Arizona State land and within a utility corridor on BLM-administered land until it intersects with the Proposed Action.	p-01, p-02, and p-03	Avoids two crossings of I-10 and the CAP and joins with a utility corridor on BLM managed lands.	Private – 14.8 BLM – 7.3 Arizona State Trust – 3.1	25.2
i-01	From the intersection of Segments p-01 and p-02, heads west-northwest and parallels I-10 to the south, as it traverses private and Arizona state trust land, crossing the CAP two times. Portions would be within a utility corridor on BLM managed lands.	p-02, p-03, and a portion of p-04	In conjunction with other segments would avoid Segment p-06 crossing the Kofa NWR; and could be assembled with other segments to constitute a route within BLM utility corridors.	Arizona State Trust – 5.3 Private – 2.8 Reclamation – 0.1 BLM – 0.1	8.3
i-02	From the intersection of Segments i-01 and x-01, heads west-northwest and parallels I-10 to the south, as it traverses BLM-administered land, and would be wholly within utility corridors.	p-04, p-05	In conjunction with other segments would avoid Segment p-06 crossing the Kofa NWR; and could be assembled with other segments to constitute a route within BLM utility corridors.	BLM – 3.3	3.3

SEGMENT	DESCRIPTION	ALTERNATIVE TO	BENEFIT	JURISDICTION MILES	TOTAL LENGTH (MILES)
i-03	From the intersection of Segments i-02 and x-03, heads west-northwest and parallels I-10 to the south, as it traverses BLM-administered, private, and Arizona state trust land, crossing the CAP twice at the eastern end of the segment. It is wholly within utility corridors on BLM-administered land.	A portion of p-06 and x-04	In conjunction with other segments would avoid Segment p-06 crossing the Kofa NWR; and could be assembled with other segments to constitute a route within BLM utility corridors.	BLM –12.2 Arizona State Trust – 6.2 Private – 1.5	19.9
i-04	From the intersection of Segments i-03, x-04, and in-01, heads west-northwest and then generally due west as it parallels I-10 to the south, as it traverses BLM-administered land, it is wholly within utility corridors.	A portion of p-06 and in-01	In conjunction with other segments would avoid Segment p-06 crossing the Kofa NWR; and could be assembled with other segments to constitute a route within BLM utility corridors.	BLM – 10.5	10.5
in-01	From the intersection with Segments i-03 and i-04, in-01 would cross to the north side of and parallel I-10 on BLM-administered land within utility corridors.	i-04 and i-05	Would locate the transmission line north of I-10 protecting dominant scenic views of the New Water Mountain Wilderness and Kofa NWR to the south.	BLM – 13.9	13.9
x-01	From the intersection with Segment p-02, heads west then northwest paralleling the CAP to the south, ending just south of I-10. Crosses BLM-administered land and Arizona state trust land. Within utility corridors	p-03 and p-04, i-01	Would follow the CAP and consolidate disturbance, and avoid CAP crossings by Segment i-01. Would place the route farther away from the Eagletail Mountains WA.	Arizona State Trust – 3.7 BLM – 1.0	4.7

SEGMENT	DESCRIPTION	ALTERNATIVE TO	BENEFIT	JURISDICTION MILES	TOTAL LENGTH (MILES)
	on BLM managed lands at either end.				
x-02a	From the intersection with Segments i-01 and i-02, heads southeast crossing Arizona state trust land and a small portion of BLM-administered land. Not within a utility corridor.	p-04	In conjunction with a portion of Segment x-01, would provide an alternative cross-connection between the Proposed Action or Segment d-01 and segments within BLM utility corridors and avoids Segment p-06 crossing the Kofa NWR.	Arizona State Trust– 3.1 BLM – 0.1	3.2
x-02b	From the intersection with Segments p-03, d-01, and p-04, heads northwest crossing BLM-administered and Arizona state trust land. Begins within a utility corridor on BLM managed lands, but primarily occurs outside of one.	p-04	In conjunction with Segment x-02a, would provide an alternative cross-connection between the Proposed Action or Segment d-01 and segments within BLM utility corridors and avoids Segment p-06 crossing the Kofa NWR.	Arizona State Trust – 2.6 BLM – 0.8	3.4
x-03	From the intersection of Segments p-04 and p-05, heads northwest through BLM-administered land, terminating south of I-10. Begins and ends within utility corridors, but primarily outside of them.	x-01, x-02a, x-02b, and x-04	Would provide an alternative cross-connection between the Proposed Action and segments within BLM utility corridors and avoids Segment p-06 crossing the Kofa NWR.	BLM – 5.6	5.6

SEGMENT	DESCRIPTION	ALTERNATIVE TO	BENEFIT	JURISDICTION MILES	TOTAL LENGTH (MILES)
x-04	From the intersection with Segments p-05 and p-06, heads northwest through primarily BLM-administered land, terminating south of I-10. Begins and ends within utility corridors, but primarily outside of them. Crosses through a parcel of Arizona state trust land and the proposed Arizona Peace Trail.	x-01 through 03, i-03, and a portion of p-06	Would provide an alternative cross-connection between the Proposed Action and segments within BLM utility corridors and avoids Segment p-06 crossing the Kofa NWR in conjunction with other segments.	BLM – 21.6 Arizona State Trust – 1.1	22.7

2.4.4.2 Quartzsite Zone

The Quartzsite Zone (Appendix 1, Figure 2.4-3) includes all of the alternative segments in the immediate vicinity of the Town of Quartzsite (Table 2.4-2). None of the alternatives go through Quartzsite, rather they are all routed around the town limits.

Table 2.4-2 Summary of Quartzsite Zone Alternative Segments

SEGMENT	DESCRIPTION	ALTERNATIVE TO	BENEFIT	JURISDICTION MILES	TOTAL LENGTH (MILES)
p-07	See Table 2.2-1				
p-08					
i-05	From the intersection of Segments i-04 and x-05, heads generally west and parallels I-10 to the south, as it traverses BLM-administered land, it is wholly within utility corridors.	p-07	In conjunction with other segments, could be assembled to constitute a route almost entirely within BLM utility corridors.	BLM – 2.8	2.8

SEGMENT	DESCRIPTION	ALTERNATIVE TO	BENEFIT	JURISDICTION MILES	TOTAL LENGTH (MILES)
qn-01	Segment that crosses I-10 at the intersection of Segments i-05 and qs-01, and in-01 and qn-02; within utility corridors, solely within BLM-administered land.	North-south portion of in-01	Would follow the existing WAPA 161kV transmission line and allow Segment in-01 to connect to Segment x-06 to avoid Quartzsite and generally parallel SR 95; or to segment qs-01 to skirt the south side of Quartzsite. Would also allow Segment i-05 to connect to Segment qn-02 to skirt Quartzsite on the north.	BLM – 0.6	0.6
qn-02	From the intersection with in-01 and qn-01, skirts to the north of Quartzsite, by traveling north, then west, then southwest. Crosses SR 95 and a utility corridor, and crosses I-10 at its western end. It begins and ends within utility corridors but is mostly outside them. Primarily within BLM-administered land, but is within Arizona state trust land just west of the SR 95 crossing.	qs-01, qs-02, p-08, and p-09	Would skirt Quartzsite to the north by following the existing Western/ San Diego Gas & Electric (SDG&E) 161kV transmission line on the east and north. Avoids impacts to the northern portion of the LTVA (Segments qs-01 and qs-02).	BLM – 9.8 Arizona State Trust – 1.0	10.8

SEGMENT	DESCRIPTION	ALTERNATIVE TO	BENEFIT	JURISDICTION MILES	TOTAL LENGTH (MILES)
qs-01	From the intersection of i-05, qn-01, and x-06, heads slightly southwest of Quartzsite and within the extreme northern portion of the LTVA, ending at SR 95, within BLM-administered land. Partly within a BLM designated utility corridor.	p-08, qn-02	Would avoid Quartzsite by skirting to the southeast following the existing Western/SDG&E 161kV transmission line. In conjunction with qs-02, would be shorter than Segments qn-01 and qn-02. In addition to skirting Quartzsite, would allow a southern connection down to the Proposed Action or continue an east-west route south of I-10 within BLM utility corridors.	BLM – 3.1	3.1
qs-02	Heads slightly southwest of Quartzsite and within the extreme northwestern portion of the LTVA, beginning at SR 95, within BLM-administered land. Just south of I-10 turns westerly to parallel the south side of I-10. Partly within utility corridors on BLM managed lands. Western portion parallels I-10 to the south.	Portions of p-09 and qn-02	Would avoid Quartzsite by skirting to the southwest, generally following an existing pipeline route; but also skirting south of Q Mountain.	BLM – 4.8	4.8

SEGMENT	DESCRIPTION	ALTERNATIVE TO	BENEFIT	JURISDICTION MILES	TOTAL LENGTH (MILES)
x-05	From the intersection of Segments p-06 and p-07, heads north-northeast through BLM-administered land, east of the LTVA. Begins and ends within utility corridors but the segment is primarily outside of them.	x-06	Would provide an alternative cross-connection between the Proposed Action and segments within BLM utility corridors; avoids Segment p-06 crossing the Kofa NWR, Quartzsite, and the LTVA in conjunction with other segments.	BLM – 10.2	10.2
x-06	From the intersection of Segments p-07 and p-08, heads north-northeast through BLM-administered land, on the eastern boundary of the LTVA. Begins and ends within utility corridors but the segment is primarily outside of them.	x-05 and x-07	Would provide an alternative cross-connection between the Proposed Action and segments within BLM utility corridors; avoids Segment p-06 crossing the Kofa NWR, Quartzsite, and the LTVA in conjunction with other segments.	BLM – 9.2	9.2
x-07	From the intersection with p-08 and p-09, heads due north along SR 95, through a utility corridor on BLM-administered land.	x-05 and x-06	Would provide an alternative cross-connection between the Proposed Action and segments within BLM utility corridors; avoids Segment p-06 crossing the Kofa NWR. Would follow the existing Western/ SDG&E 161kV transmission line east of SR 95.	BLM – 7.7	7.7

2.4.4.3 Copper Bottom Zone

The Copper Bottom Zone segments (Appendix 1, Figure 2.4-4) all occur in the Copper Bottom Pass area (Table 2.4-3).

Table 2.4-3 Summary of Copper Bottom Zone Alternative Segments

SEGMENT	DESCRIPTION	ALTERNATIVE TO	BENEFIT	JURISDICTION MILES	TOTAL LENGTH (MILES)
p-09	See Table 2.2-1				
p-10					
p-11					
p-12					
p-13					
p-14					
cb-01	From the intersection of Segments p-09 and p-10, exits the utility corridor then turns west-northwest across BLM-administered land overtop Cunningham Peak near an existing communications site.	In conjunction with other segments, p-10, p-11, p-12, cb-02, and cb-03	Together with other segments, would avoid Copper Bottom Pass, as well as Segment cb-02 through Johnson Canyon.	BLM – 3.2	3.2
cb-02	From the intersection of Segments p-10 and p-11, exits the utility corridor, heads west-southwest through Johnson Canyon and the proposed Arizona Peace Trail. All within BLM-administered land.	In conjunction with other segments, p-11, cb-01, and cb-03	Together with other segments, would avoid Copper Bottom Pass, as well as Segment cb-01 over Cunningham Peak.	BLM – 2.2	2.2
cb-03	From the intersection of Segments p-10 and cb-02, heads northwest through Copper Bottom Pass, generally parallel to Segment p-11. Crosses BLM- and Reclamation-managed lands and Colorado River Indian Tribes (CRIT) land.	p-11	Would be within a utility corridor on BLM-administered land and partially within utility corridors. Would provide the needed separation from the existing DPV1 line, allowing compliance with CAISO requirements without requiring	BLM – 2.2 CRIT – 2.0 Reclamation – 0.1	4.3

SEGMENT	DESCRIPTION	ALTERNATIVE TO	BENEFIT	JURISDICTION MILES	TOTAL LENGTH (MILES)
			construction upslope of the existing DPV1.		
cb-04	From the intersection of Segments cb-01 and cb-02, heads southwest through primarily BLM-administered land, ending in Reclamation-managed land.	In conjunction with portions of p-11, p-12, and cb-03	Together with other segments avoids Copper Bottom Pass and crossing CRIT land.	BLM – 1.7 Reclamation – 0.2	1.9
cb-05	From the intersection of Segments cb-04 and cb-06, begins in Reclamation-managed land, heads southwest through BLM-administered land then turns west to avoid interference with the YPG. Crosses the proposed Arizona Peace Trail and ends within a utility corridor on BLM managed lands.	p-13	Together with other segments avoids Copper Bottom Pass and interference with the YPG. While the segment would cross the proposed Arizona Peace Trail, it would avoid following the trail along Segment p-13.	BLM – 3.9 Reclamation – 0.5	4.4
cb-06	From the intersection of Segments cb-04 and cb-05, begins in Reclamation-managed land, heads northwest through BLM-administered land then turns slightly northwest to where it intersects with the Proposed Action. Ends within a utility corridor on BLM-administered land.	In conjunction with other segments, p-11, p-12, cb-03	Together with other segments avoids Copper Bottom Pass and crossing CRIT land.	BLM – 1.3 Reclamation – 0.6	1.9

SEGMENT	DESCRIPTION	ALTERNATIVE TO	BENEFIT	JURISDICTION MILES	TOTAL LENGTH (MILES)
i-06	From the intersection with qs-02 and qn-02, heads slightly southwest and parallels I-10 to the south as it traverses BLM- and Reclamation-managed land, CRIT, and Arizona state trust land. It is within a BLM utility corridor.	p-09 through 11; cb-01 through 03	In conjunction with other segments would avoid Copper Bottom Pass, Johnson Canyon, and Cunningham Peak; and could be assembled with other segments to constitute a route almost fully within BLM utility corridors.	BLM – 3.9 Arizona state Trust – 1.7 CRIT – 1.4 Reclamation – 0.2	7.2
i-07	From the intersection with Segments i-06 and x-08, heads southwest toward the Colorado River and parallels I-10 to the south as it traverses Reclamation-managed land and Arizona state trust land.	p-12 through 14; and portions of p-15e and cb-10	Could be assembled with other segments to constitute a route almost fully within BLM utility corridors.	Reclamation – 5.1 Arizona State Trust – 1.2	6.3
x-08	From the intersection with Segments p-11, p-12, and cb-03, heads north-northwest to connect to the alternative segments paralleling I-10 within BLM utility corridors at the junction of Segments i-06 and i-07. Crosses Reclamation-managed land.	x-05, x-06, and x-07	Would provide an alternative cross-connection between the Proposed Action and segments within BLM utility corridors; could avoid Copper Bottom Pass, Johnson Canyon, or CRIT land in conjunction with other segments.	Reclamation – 1.3	1.3

2.4.4.4 Colorado River and California Zone

The Colorado River and California Zone (Appendix 1, Figure 2.4-5; Table 2.4-4) includes segments from the Colorado River crossings through the remainder of the Project Area in California.

Table 2.4-4 Summary of Colorado River and California Zone Alternative Segments

SEGMENT	DESCRIPTION	ALTERNATIVE TO	BENEFIT	JURISDICTION MILES	TOTAL LENGTH (MILES)
p-15e	See Table 2.2-1				
p-15w					
p-16					
p-17					
p-18					
Arizona					
cb-10	From Segment p-14, heads west through BLM-administered land and Arizona state trust land, then ends at the Colorado River.	A portion of p-15e	Offers an alternative to the Proposed Action to connect to a more northern east-west route comprised of Segment ca-01. This segment includes land submerged by the Colorado River.	Arizona State Trust – 1.0 BLM – 0.9	1.9
i-08s	From the intersection with Segment i-07, heads west crossing Reclamation-managed land, Arizona state trust land that is farmed, and ends at the Colorado River.	p-15e and cb-10	Would avoid the Colorado River floodplain in proximity to the I-10 crossing where the western bank of the river is heavily developed, while also avoiding the backwater areas that are important to endangered fish species.	Reclamation – 0.9 Private – 0.2 Arizona State Trust – 0.2	1.3
California					
ca-01	From the intersection of Segments x-10 and x-11, heads west across private agricultural land following an existing canal and two-track.	p-15w and ca-05	Offers an alternative to the Proposed Action crossing agricultural land that would not impact residences or other structures (as compared to Segment ca-05).	Private – 6.7	6.7

SEGMENT	DESCRIPTION	ALTERNATIVE TO	BENEFIT	JURISDICTION MILES	TOTAL LENGTH (MILES)
ca-02	From the intersection of Segments x-12 and x-13, headed west crossing private agricultural land following an existing canal, until reaching the western edge of the Colorado River floodplain, then continued west, ascending a bluff onto BLM-administered land.	p-16, ca-06, and i-09b	Mostly follows existing canal, until ascending a bluff onto BLM-administered land. Would be partially within a utility corridor and extend the ca-01 route west, as a shorter alternative to that portion of the Proposed Action route.	Private – 2.8 BLM – 0.6	3.4
ca-04	From the intersection with Segment i-08s, heads west crossing private land that is farmed.	p-15e and cb-10	Would avoid the Colorado River floodplain in proximity to the I-10 crossing where the western bank of the river is heavily developed, while also avoiding the backwater areas that are important to endangered fish species.	Private – 0.4	0.4
ca-05	From the intersection of Segments x-09 and x-10, heads west across private agricultural land interspersed with residences along Seeley Road.	ca-01 and a portion of p-15w	Offers an east-west route across private land that, in conjunction with other segments, could provide a route within BLM utility corridors south of I-10 avoiding Blythe.	Private – 6.6	6.6

SEGMENT	DESCRIPTION	ALTERNATIVE TO	BENEFIT	JURISDICTION MILES	TOTAL LENGTH (MILES)
ca-06	From the intersection of Segments ca-05 and x-12, heads west across private agricultural land interspersed with residences along Seeley Road, entering BLM-administered land on the western end. Crosses the approved Blythe Mesa Solar Project.	p-16	Offers an east-west route across private land that, in conjunction with other segments, could provide BLM utility corridor route south of I-10 avoiding Blythe.	Private – 2.6 BLM – 0.2	2.8
ca-07	From its intersection with Segment x-15, heads northwest then west crossing primarily BLM-administered land along a BLM utility corridor southern boundary, then bends west-northwest to connect at the intersection with Segment ca-09.	Portion of p-17	Offers an east-west route that, in conjunction with other segments, could provide a route within BLM utility corridors south of I-10 avoiding Blythe.	BLM – 2.5 Private – 0.5	3.0
ca-09	From the intersection with Segment ca-07, heads west along BLM-administered land in BLM utility corridors and alongside the proposed Desert Quartzite Solar Project. It is also adjacent to the south edge of the existing Blythe Mesa Solar Project.	Portions of p-17 and p-18	Offers an east-west route that extends the Seeley Road route west to connect at the substation within the southern boundary of a BLM utility corridor.	BLM – 1.6 Private – 1.0	2.6
x-09	From the intersection with Segment ca-04, heads south through private, rural agricultural land west of the Colorado River. Not in utility corridors.	Portion of x-11	Would connect segments i-08 or ca-04 within a BLM utility corridor route to other east-west alignments south of I-10.	Private – 0.8	0.8

SEGMENT	DESCRIPTION	ALTERNATIVE TO	BENEFIT	JURISDICTION MILES	TOTAL LENGTH (MILES)
x-10	From the intersection with Segments x-09 and ca-05, heads south through private agricultural land west of the Colorado River. Not in utility corridors.	x-12, x-15, and p-18	Would connect Segment x-09 with Segments x-11 and cb-10, allowing a BLM utility corridor route along I-10 to connect down to other east-west routes, avoiding Blythe or Copper Bottom Pass.	Private – 1.3	1.3
x-11	From the intersection with Segment cb-10, heads north, then northwest through rural agricultural land.	A portion of p-15e	Offers an alternative to the Proposed Action to connect to a more northern east-west route comprised of Segment ca-01.	Private – 2.1	2.1
x-12	From the intersection with Segments ca-05 and ca-06, heads south from the 14th Avenue alignment across private agricultural land west of SR 78, then heads south following a canal and two-track crossing private land.	x-10, x-15, and portions of p-17 and p-18	Would connect the east-west route comprised of ca-01 north to segments that would comprise a BLM utility corridor route. It would avoid cultural resources potentially along x-15, x-16 or p-17 and p-18; and connect south to other east-west segments.	Private – 1.3	1.3

SEGMENT	DESCRIPTION	ALTERNATIVE TO	BENEFIT	JURISDICTION MILES	TOTAL LENGTH (MILES)
x-13	From the intersection with x-12 and ca-01, heads south generally following a canal and two-track crossing private land.	cb-10, x-16, p-17	Would connect Proposed Action north to segments that would comprise a BLM utility corridor route; and avoid cultural resources potentially along x-15, x-16 or p-17 and p-18.	Private – 2.0	2.0
x-15	From the intersection with ca-06 and ca-07, heads southwest across BLM-administered land a utility corridor.	x-12 and p-18	Would provide a cross-connection between the Seeley Road alignment and other east-west routes south of Blythe that would follow or possibly be within a utility corridor. Avoids cultural resources along p-17 and p-18.	BLM – 1.4	1.4
x-16	From the intersection with Segment x-15 and ca-02, heads southwest across BLM-administered and private land within a utility corridor and intersects with Segment p-16. It forms the southeastern boundary of the approved Desert Quartzite solar project.	x-13 and p-17	Would provide a cross-connection between the east-west canal alignment (ca-01 through 03) and other east-west routes south of Blythe that would follow or possibly be within a BLM utility corridor. Avoids cultural resources along p-17 and p-18.	BLM – 2.0 Private – 0.3	2.3

SEGMENT	DESCRIPTION	ALTERNATIVE TO	BENEFIT	JURISDICTION MILES	TOTAL LENGTH (MILES)
x-19	From Segment ca-09, heads south along BLM-administered land starting at the southern edge of a BLM utility corridor and, continuing southwest past the Colorado River Substation, then turning west to connect with the Proposed Action route along Segment p-18, to enter and terminate at the southern end of the SCE Colorado River Substation. Crosses the approved Bright Source Energy Sonoran West Crimson Solar Facility.	Portion of x-15	Would connect the east-west route either immediately south of I-10 along the 14th Avenue alignment or the Seeley Road alignment to the SCE Colorado River Substation.	BLM – 1.0	1.0

2.4.5 Infrastructure Requirements and Disturbance Estimates by Action Alternative Segment

2.4.5.1 Alternative Series Compensation Station Location

Two alternative locations for the SCS have been identified in the event that the Proposed Action is not the BLM selected route for the transmission line. Both alternative locations would be on BLM-administered public land near the intersection of Segments x-04 and i-03 as shown in Figure 2.4-2 (Appendix 1), less than 75 feet apart (due to scale, maps show one symbol for the alternative SCS location). Specifications for the SCS would be the same as those described under the Proposed Action.

Either alternative SCS site (i-03 or x-04) would be powered via a distribution line connecting to the existing APS 12kV distribution line in Brenda, Arizona. The associated distribution line would interconnect with APS' 12-kV system in Brenda. APS has identified a potential alignment for the proposed distribution line that would originate from the 12kV system in Brenda just south of US 60. The distribution line would extend south, generally parallel and to the east of Ramsey Mine Road for approximately 1.4 miles, breaking from Ramsey Mine Road just north of I-10 and north of the i-04 Project Segment, and be located adjacent and parallel to the I-10 ADOT ROW (Figure 2.4-2). This route would be 3.1 miles long. With a typical distribution line pole span of 300 to 350 feet, the distribution line would require approximately 55 poles. Each pole would be an average of 45 feet tall and would permanently disturb a 5-foot diameter area (<0.1 acre) around each pole. The estimated temporary construction disturbance for the connection to the distribution line would be 0.8-acre, with a long-term disturbance footprint of <0.1 acre. It would also require the crossing of I-10, with taller than the typical 45-foot structures required on the north and south sides of the highway. These structures may also utilize guy wires at line angles or at the crossing of I-10. The crossing would be designed in accordance with the US Department of Transportation and ADOT requirements including aerial crossings and traffic control permits. APS would acquire an Encroachment Permit from ADOT and would follow all approved traffic control measures for pulling the wire across I-10. The Encroachment Permit may also include rights of ingress and egress to access the segment of line parallel to I-10 for construction purposes. No material staging/, laydown yards, or batch plants would be required for the alternative distribution line.

The distribution line would be accessed using existing roads or access roads constructed for the transmission line; no new access would be required for construction of the distribution line. A crossing of I-10 would be required for the distribution line, which may require taller than average poles on either side of the crossing. The crossing would be designed in accordance with ADOT requirements, as applicable, including aerial crossings and traffic control permits.

The structures may utilize guy wires at line angles or at the crossing of roads. APS would acquire an Encroachment Permit from ADOT, if applicable, and would follow all approved traffic control measures for pulling the wire. No additional material staging and laydown yards or batch plants would be required for the construction of the Alternative SCS distribution line.

For the SCS, up to two additional fiber optic regeneration sites would be required if the distance from the Delaney Substation to the SCS or from the SCS to the Colorado River Substation greatly exceeds 60 miles. Locations for these additional fiber optic repeaters, if needed, would be selected minimizing the length of the distribution line.

The estimated temporary and long-term disturbance for the alternative SCS footprint would be similar to that described under the Proposed Action: the SCS would be integrated into the footprint of the transmission line with a 200-foot by 315-foot fenced area. Clearing of all vegetation would be required for the entire SCS area, including a distance of 10 feet outside the fence, for a total long-term disturbance of 1.7 acres.

2.4.5.2 Access Road Requirements by Action Alternative Segment

The types of access roads for alternative segments would be the same as described for the Proposed Action. Probable access roads for Action Alternative Segments by type and length are shown in Table 2.4-5 and are displayed on Figures 2.2-4 – 2.2-7 (Appendix 1).

Table 2.4-5 Alternative Segments Access Roads and Long-term Disturbance Summary by Segment

SEGMENT	TYPE B	TYPE C	TYPE D	PULL OUTS (10' X 150')	TURN RADIUS	LONG-TERM DISTURBANCE (ACRES)
East Plains and Kofa Zone						
d-01	38.4	25.0	17.4	0.1	1.8	82.7
i-01	2.1	18.5	1.8	1.3	0.2	23.9
i-02	0.0	10.9	0.0	0.6	0	11.5
i-03	2.9	50.0	4.8	3.2	0.3	61.2
i-04	19.5	16.3	7.8	2.3	0.6	46.5
in-01	21.1	13.8	9.6	0.1	1.0	45.6
x-01	7.2	4.7	3.3	0.0	0.3	15.5
x-02a	4.9	3.2	2.2	0.0	0.2	10.5
x-02b	5.2	3.4	2.4	0.0	0.2	11.2
x-03	8.6	5.6	3.9	0.0	0.4	18.5
x-04	34.4	22.4	15.6	0.1	1.6	74.1
Quartzsite Zone						
i-05	7.8	7.5	0.0	1.0	0.1	16.4
qn-01	0.9	0.6	0.4	0.0	0.0	1.9
qn-02	16.5	10.7	7.5	0.1	0.8	35.6
qs-01	4.7	3.1	2.1	0.0	0.2	10.1
qs-02	7.3	4.8	3.3	0.0	0.3	15.7
x-05	18.3	15.1	7.7	2.5	0.5	44.1
x-06	21.4	24.2	0.1	2.9	0.1	48.7
x-07	11.8	7.7	5.3	0.0	0.5	25.3
Copper Bottom Zone						
cb-01[1]	0.0	0.0	15.2	0.3	0.0	15.5
cb-02[1]	0.0	0.0	0.0	0.0	0.0	0.0
cb-03	6.6	4.3	3.0	0.0	0.3	14.2
cb-04	9.5	1.3	0.8	0.6	0.2	12.4
cb-05	8.7	13.3	0.8	1.2	0.1	24.1
cb-06	6.5	6.3	0.0	0.7	0.1	13.6
i-06	11.0	7.2	5.0	0.0	0.5	23.7
i-07	9.6	6.3	4.4	0.0	0.4	20.7
x-08	2.0	1.3	0.9	0.0	0.1	4.3
Colorado River and California Zone						
Arizona						
cb-10	2.9	1.9	1.3	0.0	0.1	6.2
i-08s	2.0	1.3	0.9	0.0	0.1	4.3
California						
ca-01	10.1	6.6	4.6	0.0	0.5	21.8
ca-02	5.1	3.4	2.3	0.0	0.2	11
ca-04	0.5	0.4	0.2	0.0	0.0	1.1
ca-05	10.1	6.6	4.6	0.0	0.5	21.8
ca-06	9.0	0.0	1.3	0.6	0.3	11.2
ca-07	7.5	1.8	2.3	0.7	0.2	12.5

SEGMENT	TYPE B	TYPE C	TYPE D	PULL OUTS (10' X 150')	TURN RADIUS	LONG-TERM DISTURBANCE (ACRES)
ca-09	5.7	0.0	2.3	0.5	0.2	8.7
x-09	1.2	0.8	0.5	0.0	0.1	2.6
x-10	1.9	1.2	0.9	0.0	0.1	4.1
x-11	3.2	2.1	1.5	0.0	0.1	6.9
x-12	7.8	0.0	0.2	0.6	0.2	8.8
x-13	3.1	0.0	0.3	0.2	0.2	3.8
x-15	3.4	0.0	1.1	0.3	0.0	4.8
x-16	4.6	0.0	1.8	0.4	0.3	7.1
x-19	3.7	0.0	1.3	0.3	0.0	5.3

[1] Helicopter access would be required for these segments. Segments cb-01 and cb-02 are alternatives to each other. Should one of these segments be included in the Preferred Alternative, one helicopter staging area of approximately 43.5 acres would be required.

Types A and E access would not require any new disturbance.

Construction of the distribution line to the alternative SCS would be accessed via existing routes and no new access would be required.

Helicopter Access

In areas where crane access is not feasible, helicopters would be used to airlift in sections of structure steel and to place structures on the poured foundations. Helicopters would pick up pre-assembled subsections of the lattice steel structures, place them on the foundations, and ground crews would assemble the structures with hardware. This process would continue until the structure is erected.

Helicopter operations require helicopter fly yards, preferably one on either side of each helicopter construction area (about five miles apart maximum) for supporting helicopter-only and helicopter assist construction. Helicopter-only construction may be necessary for construction of the Project in the Copper Bottom Pass area. Additional detail regarding the proposed locations and acreage for fly yards associated with the Proposed Action through the Copper Bottom Pass area are provided in Section 2.2.7.2. Under the Action Alternatives, two fly yards could be utilized; one as proposed (7.6 acres, segment cb-01) and an additional fly yard (43.5 acres (segments cb-01 and cb-02). Duration of use for the fly yard is the same as the duration of construction activity within the Copper Bottom Pass area and the adjacent segments. Fly yards are subject to change upon further site analysis and final engineering of the line.

The construction contractor(s) would ultimately decide the need for helicopter construction usage on the Project, except in areas where constructing access roads is not feasible. A Helicopter Flight and Safety Plan has been developed and included as a part of the final POD. The hours of operation and expected number of miles of structures that could be erected per day would be described in the Helicopter Flight and Safety Plan.

It is common to use a light helicopter to string the pilot line. The pilot line is then attached to a hard line on the ground, which is then attached to the conductor for actual pulling of the conductor. If utilized, the light helicopter would be operating for approximately 8 hours per week during stringing and its use would also be described in the Helicopter Flight and Safety Plan.

Some Project segments may not provide the potential for development of safe and stable access roads or structure work areas unless mass grading occurs. Road development to these sites would allow for tracked equipment only to drill the foundations. These sites would require the use of a helicopter for activities other than drilling. Full access road development would require large amounts of disturbance, which would be limited with helicopter-assist construction, whether the footing be micropile or conventional anchor bolt cages. Micropile footing or conventional anchor bolt cage use would be determined during detailed design.

Table 2.4-5 indicates that Segments cb-01 and cb-02 would require helicopter access for construction. Because these segments are alternatives to each other, it is assumed that one helicopter staging area would be required, disturbing approximately 43.5 acres. The location would be at either the intersection of Segment p-10 with cb-02 (if cb-02 were selected as a part of the Preferred Alternative) or cb-01 (if cb-01 were selected as a part of the Preferred Alternative). As these locations are situated in remote areas in the Copper Bottom Pass area, risk to the public from structure transportation is not high. Traffic control measures would be implemented in these remote areas during structure transportation activities.

2.4.5.3 Temporary Use Area Requirements by Action Alternative Segment

Material staging and laydown yards and batch plants would result in short-term disturbance (Section 2.2.7.2, Temporary Use Areas). Material staging and laydown yards would be strategically located along the Action Alternative routes, with a total maximum disturbance of 34.5 acres. An average of one staging/crew show-up area per 20 line-miles is assumed for the Project, currently identified in Tonopah, Quartzsite, Salome, and Blythe. Material laydown areas, not to exceed four, would be within the ROW or adjacent to it.

2.4.5.4 Transmission Line Structure Requirements by Action Alternative Segment

Table 2.4-6 presents a summary of estimated structure quantities by structure type, short-term disturbance, and long-term disturbance for each of the Action Alternative Segments. Actual quantities may change depending on site conditions and the overall routes selected.

Table 2.4-6 Structure Type and Disturbance Summary by Action Alternative Segment

SEGMENT	LINE MILES	TOTAL STRUCTURES	SELF-SUPPORTED TANGENT	GUYED V TANGENT	SELF-SUPPORTED DEAD-END	H-FRAME	MONO-POLE	SUB-STATION DEAD-END	S-T DIST. (ACRES)[1]	L-T DIST. (ACRES)[2]
East Plains and Kofa Zone										
d-01	25.2	83	0	57	4	21	0	1	91.3	5.4
i-01	8.3	27	2	24	1	0	0	0	29.7	1.8
i-02	3.3	11	1	10	0	0	0	0	12.1	0.7
i-03	19.9	64	15	49	0	0	0	0	70.4	4.6
i-04	10.5	38	6	21	9	0	0	2	41.8	3.2
in-01	13.9	53	19	21	13	0	0	0	58.3	4.9
x-01	4.7	16	0	13	3	0	0	0	17.6	1.1
x-02a	3.2	12	0	11	1	0	0	0	13.2	0.8
x-02b	3.4	10	0	10	0	0	0	0	11.0	0.6
x-03	5.6	18	0	17	1	0	0	0	19.8	1.1
x-04	22.7	73	0	72	1	0	0	0	80.3	4.4
Quartzsite Zone										
i-05	2.8	9	9	0	0	0	0	0	9.9	1.0
qn-01	0.6	3	2	0	1	0	0	0	3.3	0.3
qn-02	10.8	37	6	28	3	0	0	0	40.7	2.7
qs-01	3.1	10	0	9	1	0	0	0	11.0	0.7
qs-02	4.8	17	3	11	3	0	0	0	18.7	1.3
x-05	10.2	35	0	34	1	0	0	0	38.5	2.1
x-06	9.2	32	1	29	2	0	0	0	35.2	2.1
x-07	7.7	26	0	23	3	0	0	0	28.6	1.7
Copper Bottom Zone										
cb-01	3.2	15	13	0	2	0	0	0	16.5	1.7
cb-02	2.2	11	11	0	0	0	0	0	12.1	1.3
cb-03	4.3	17	9	0	8	0	0	0	18.7	2.0
cb-04	1.9	6	0	6	0	0	0	0	6.6	0.4

SEGMENT	LINE MILES	TOTAL STRUCTURES	SELF-SUPPORTED TANGENT	GUYED V TANGENT	SELF-SUPPORTED DEAD-END	H-FRAME	MONO-POLE	SUB-STATION DEAD-END	S-T DIST. (ACRES)[1]	L-T DIST. (ACRES)[2]
cb-05	4.4	16	0	15	1	0	0	0	17.6	1.0
cb-06	1.9	6	0	5	1	0	0	0	6.6	0.4
i-06	7.2	26	11	10	5	0	0	0	28.6	2.4
i-07	6.3	22	2	18	2	0	0	0	24.2	1.5
x-08	1.3	5	3	1	1	0	0	0	5.5	0.5
Colorado River and California Zone										
Arizona										
cb-10	1.9	8	2	3	3	0	0	0	8.8	0.8
i-08s	1.3	6	3	0	2	1	0	0	6.6	0.6
California										
ca-01	6.7	26	0	0	1	25	0	0	28.6	1.8
ca-02	3.4	13	2	0	1	10	0	0	14.3	1.0
ca-04	0.4	2	1	0	1	0	0	0	2.2	0.2
ca-05	6.6	26	0	0	1	25	0	0	28.6	1.8
ca-06	2.8	10	7	0	2	1	0	0	11.0	1.1
ca-07	3.0	11	4	7	0	0	0	0	12.1	0.9
ca-09	2.6	9	1	7	1	0	0	0	9.9	0.6
x-09	0.8	4	1	0	1	2	0	0	4.4	0.4
x-10	1.3	5	0	0	1	4	0	0	5.5	0.4
x-11	2.1	7	1	0	2	4	0	0	7.7	0.6
x-12	1.3	4	4	0	0	0	0	0	4.4	0.5
x-13	2.1	7	6	0	1	0	0	0	7.7	0.8
x-15	1.4	6	1	4	1	0	0	0	6.6	0.5
x-16	2.3	8	0	7	1	0	0	0	8.8	0.5
x-19	1.0	5	2	0	2	0	0	1	5.5	0.6

SEGMENT	LINE MILES	TOTAL STRUCTURES	SELF-SUPPORTED TANGENT	GUYED V TANGENT	SELF-SUPPORTED DEAD-END	H-FRAME	MONO-POLE	SUB-STATION DEAD-END	S-T DIST. (ACRES)[1]	L-T DIST. (ACRES)[2]
Other										
Alt SCS	N/A	1	0	0	0	0	0	0	<0.1	0.0
Alt SCS Dist. Line	3.1	55[3]	0	0	0	0	55[3]	0	0.8	<0.1

S-T: short-term; L-T: long-term; N/A: Not Applicable
Assumptions:
[1]Short-term disturbance areas include 20 percent buffer addition for final design considerations (200' x 200' = 0.9 acre + 20% = 1.1 acre). Short-term disturbance assumes approximately 1.1 acres per structure site.
[2]Long-term disturbance assumes:
Guyed V structure foundations of 9 feet by 9 feet for a total of 81 square feet (0.002-acre) per structure.
H-Frame structure foundations include two of 12 feet by 18 feet for a total of 432 square feet (0.01-acre) per structure.
Self-supporting tangent and dead-end structures of 50 feet by 50 feet for a total of 2,500 square feet (0.06-acre) per structure.
[3] These poles would be either wood or steel monopoles.

2.4.5.5 Wire Stringing Requirements by Alternative Segment

Snubbing and pulling sites associated with wire stringing would be temporarily disturbed. Table 2.4-7 provides these short-term disturbance acreages.

Table 2.4-7 Disturbance Associated with Wire Stringing by Action Alternative Segment

SEGMENT	LINE MILES	SNUBBING SITE DISTURBANCE (ACRES)*	PULLING SITE DISTURBANCE (ACRES)*	TOTAL SHORT-TERM DISTURBANCE (ACRES)
East Plains and Kofa Zone				
d-01	25.2	16.5	16.1	32.6
i-01	8.3	5.5	5.5	11.0
i-02	3.3	5.5	0	5.5
i-03	19.9	19.3	0	19.3
i-04	10.5	8.3	0	8.3
in-01	13.9	8.3	6.9	15.2
x-01	4.7	2.8	2.3	5.1
x-02a	3.2	2.8	2.3	5.1
x-02b	3.4	2.8	2.3	5.1
x-03	5.6	5.5	4.6	10.1
x-04	22.6	16.5	13.8	30.3
Quartzsite Zone				
i-05	2.8	0.0	0.0	0.0
qn-01	0.6	0.0	0.0	0.0
qn-02	10.8	8.3	6.9	15.2
qs-01	3.1	2.8	2.3	5.1
qs-02	4.8	2.8	4.6	7.4
x-05	10.2	8.3	3.2	11.5
x-06	9.2	5.5	9.2	14.7
x-07	7.7	5.5	4.6	10.1
Copper Bottom Zone				
cb-01	3.2	2.8	4.6	7.4
cb-02	2.2	2.8	4.6	7.4
cb-03	4.3	2.8	2.3	5.1
cb-04	1.9	0	2.3	2.3
cb-05	4.4	2.8	2.3	5.1
cb-06	1.9	0	6.9	6.9

SEGMENT	LINE MILES	SNUBBING SITE DISTURBANCE (ACRES)*	PULLING SITE DISTURBANCE (ACRES)*	TOTAL SHORT-TERM DISTURBANCE (ACRES)
i-06	7.2	5.5	4.6	10.1
i-07	6.3	5.5	4.6	10.1
x-08	1.3	0.0	0.0	0.0
Colorado River and California Zone				
Arizona				
cb-10	1.9	0	2.3	2.3
i-08s	1.3	0.0	0.0	0.0
California				
ca-01	6.7	5.5	4.6	10.1
ca-02	3.4	2.8	2.3	5.1
ca-04	0.4	0	0	0
ca-05	6.6	5.5	4.6	10.1
ca-06	2.8	0	4.6	4.6
ca-07	3.0	2.8	0	2.8
ca-09	2.6	2.8	4.0	6.8
x-09	0.8	0.0	2.3	2.3
x-10	1.3	0.0	0.0	0.0
x-11	2.1	2.8	2.3	5.1
x-12	1.3	0.0	2.3	2.3
x-13	2.0	0.0	2.3	2.3
x-15	1.4	0	4.6	4.6
x-16	2.3	2.8	3.4	6.2
x-19	1.0	0	6.9	6.9
Other				
Alt SCS Dist. Line*	3.1	0.0	2.5	2.5

Assumptions:
Snubbing sites estimated at 2.8 acres of disturbance each located 5 miles apart along the line.
Pulling sites estimated at 2.3 to 2.8 acres of disturbance each located at 5 miles apart along the line.
*Wire stringing for alternative distribution line associated with the alternative SCS.

2.4.5.6 Existing Utility Lines and ROW Crossings by Action Alternative Segment

Guard crossings would be needed over highways, transmission lines, structures, waterways, and other obstacles prior to conductor stringing. The guard structures are typically vertical 16- to 24-inch-diameter wood poles with cross arms, on a 2 x H-frame configuration. Two crossing guard structures are required per crossing, one on each side.

All guard structures would be located within the Project ROW. The short-term disturbance associated with installation of guard structures would consist of an approximately 50-foot by 200-foot work area at the base of each structure and three holes approximately 2 feet in diameter, with a total of 1,000 square feet (0.23-acre) of short-term disturbance per crossing. The installation method of the guard structures would be direct embedding with crushed rock and excavated material. All excavated material for the guard structures would be used to backfill these guard structures. As such, no excavated material would require offsite removal. All topsoil would be salvaged, stockpiled, and replaced on removal of the guard structures and initiation of reclamation activities. Access to each guard structure would be in the Project ROW or by existing roads where feasible.

A summary of the number and type of crossings and the associated guard structure disturbance by segment is provided in Table 2.4-8.

Table 2.4-8 Summary of Guard Crossings Short-term Disturbance by Alternative Segment

SEGMENT	ELECTRICAL CROSSINGS	ROAD AND WATER CROSSINGS	TOTAL IMPACT (ACRES)*
East Plains and Kofa Zone			
d-01	5	13	5.5
i-01	2	4	2.8
i-02	1	1	0.5
i-03	5	7	5.1
i-04	0	2	2.5
in-01	0	6	2.3
x-01	2	1	0.9
x-02a	0	1	0.5
x-02b	1	1	0.9
x-03	1	2	1.4
x-04	2	2	1.4
Quartzsite Zone			
i-05	0	1	0.5
qn-01	0	3	0.9
qn-02	3	5	2.3
qs-01	0	1	0.5

SEGMENT	ELECTRICAL CROSSINGS	ROAD AND WATER CROSSINGS	TOTAL IMPACT (ACRES)*
qs-02	2	5	2.5
x-05	0	11	5.5
x-06	1	7	3.7
x-07	2	3	2.1
Copper Bottom Zone			
cb-01	1	3	1.6
cb-02	0	0	0.0
cb-03	2	0	0.9
cb-04	0	0	0.0
cb-05	0	4	1.8
cb-06	0	1	0.5
i-06	0	1	0.5
i-07	0	2	0.9
x-08	1	1	0.5
Colorado River and California Zone			
Arizona			
cb-10	1	1	1.1
i-08s	0	3	0.9
California			
ca-01	8	14	6.4
ca-02	2	4	1.8
ca-04	1	3	0.9
ca-05	5	11	4.8
ca-06	2	5	2.3
ca-07	3	1	0.9
ca-09	0	0	0.0
x-09	0	2	0.5
x-10	1	2	0.7
x-11	0	3	1.6
x-12	1	4	1.8
x-13	1	4	1.8
x-15	0	0	0.0
x-16	0	0	0.0
x-19	1	1	0.7
Other			
Alt SCS Dist. Line	0	1	0.5

2.4.5.7 Water Use Estimate by Action Alternative Segment

Water would be used for mixing of concrete for construction of foundations, dust suppression and reclamation. Table 2.4-9 provides the water requirements by Action Alternative segment; however, the water requirements for the alternate SCS and substation upgrades would be the same as the Proposed Action.

Table 2.4-9 Total Water Requirements for Construction by Action Alternative Segment

SEGMENT	LINE MILES	TOTAL STRUCTURES	TOTAL SNUBBING SITES	STRUCTURES* AND SNUBBING (GALLONS)	DUST CONTROL (GALLONS)	TOTAL (GALLONS)*
East Plains and Kofa Zone						
d-01	25.2	83	6	145,057.5	31,807,705.3	31,952,762.7
i-01	8.3	28	2	39,722.4	2,095,269.5	2,134,991.9
i-02	3.3	11	2	15,286.9	833,059.0	848,345.9
i-03	19.9	64	7	102,451.9	5,023,597.9	5,126,049.8
i-04	10.5	38	0	116,173.1	2,650,642.1	2,766,815.2
in-01	13.9	53	3	168,169.3	3,508,945.3	3,677,114.6
x-01	4.7	16	1	34,658.9	1,186,477.9	1,221,136.8
x-02a	3.3	12	1	19,177.0	807,814.7	826,991.7
x-02b	3.4	10	1	11,436.0	859,303.2	869,739.2
x-03	5.6	18	2	26,390.5	1,413,675.8	1,440,066.3
x-04	22.7	73	6	87,969.3	5,705,191.6	5,793,160.9
Quartzsite Zone						
i-05	2.8	9	0	26,740.8	706,837.9	733,578.7
qn-01	0.6	3	0	12,627.7	151,465.3	164,093.0
qn-02	10.8	37	3	70,080.0	2,726,374.7	2,796,454.7
qs-01	3.1	10	1	17,065.7	782,570.5	799,636.2
qs-02	4.8	17	1	41,461.3	1,211,722.1	1,253,183.4
x-05	10.2	35	0	45,216.0	2,574,909.5	2,620,125.5
x-06	9.2	30	2	48,714.7	2,322,467.4	2,371,182.1
x-07	7.7	26	2	46,095.0	1,943,804.2	1,989,899.2
Copper Bottom Zone						
cb-01	3.2	15	1	52,875.9	807,814.7	860,690.6
cb-02	2.2	11	1	33,562.9	555,372.6	588,935.5
cb-03	4.3	17	1	81,103.0	1,085,501.1	1,166,604.1
cb-04	1.9	5	0	6,333.8	479,640.0	485,973.8
cb-05	4.4	17	1	23,399.6	1,110,745.3	1,134,144.8
cb-06	1.9	8	0	29,165.3	479,640.0	491,603.5
i-06	7.2	26	2	78,425.5	1,817,583.2	1,896,008.7
i-07	6.3	22	2	40,073.8	1,590,385.3	1,630,459.1

SEGMENT	LINE MILES	TOTAL STRUCTURES	TOTAL SNUBBING SITES	STRUCTURES* AND SNUBBING (GALLONS)	DUST CONTROL (GALLONS)	TOTAL (GALLONS)*
x-08	1.3	5	0	16,654.6	328,174.7	344,829.3
Colorado River and California Zone						
Arizona						
cb-10	1.9	8	0	29,165.3	479,640.0	508,805.3
i-08s	1.3	6	0	24,483.4	328,174.7	352,658.1
California						
ca-01	6.7	26	2	63,422.6	1,691,362.1	1,754,784.7
ca-02	3.4	13	1	35,498.6	858,303.2	893,801.7
ca-04	0.4	2	0	9,656.52	100,976.8	110,633.3
ca-05	6.6	26	2	63,422.6	1,666,117.9	1,729,540.5
ca-06	2.8	10	0	36,368.2	706,837.9	743,206.1
ca-07	3.0	11	1	20,153.9	757,326.3	777,480.2
ca-09	2.6	9	1	17,925.7	656,349.5	674,275.2
x-09	0.8	4	0	14,054.8	201,953.6	216,008.4
x-10	1.3	5	0	15,481.8	328,174.7	343,656.5
x-11	2.1	7	1	26,018.0	530,128.4	556,146.4
x-12	1.3	4	0	11,884.8	328,174.7	340,059.5
x-13	2.0	7	0	24,512.5	504,884.2	529,396.7
x-15	1.4	6	0	13,879.1	353,419.0	367,298.1
x-16	2.3	8	1	14,954.5	580,616.8	595,571.3
x-19	1.0	5	0	25,998.4	252,442.1	278,440.5
Other						
Alt SCS and Substation Upgrades (Gallons)	N/A	N/A	1	20,891.6	N/A	20,891.6

* Guyed V foundations would be precast; however, grout for guyed V anchors represented here.
Assume the water per structure values provided in Table 2.2-13.
The Alternative SCS would require the same amount of water for construction as the Proposed Action SCS.
No water would be required for construction of the SCS distribution line.

2.4.5.8 Disturbance Summary by Action Alternative Segment

Table 2.4-10 summarizes the temporary and long-term disturbance associated with the Action Alternative segments.

Table 2.4-10 Summary of Short-term and Long-term Disturbance by Action Alternative Segment

SEGMENT	LONG-TERM DISTURBANCE (ACRES)					SHORT-TERM DISTURBANCE (ACRES)					
	LINE MILES	SCS	ACCESS ROADS	STRUC-TURES	TOTAL LONG-TERM DISTURBANCE	STRUC-TURES	MATERIAL STAGING AREA	HELI-COPTER	GUARD CROSS-INGS	SNUBBING AND PULLING SITES	TOTAL SHORT-TERM DISTURBANCE
East Plains and Kofa											
d-01	25.2	0	82.7	5.4	88.1	91.3		0	5.5	32.6	129.4
i-01	8.3	0	23.9	1.9	25.7	29.7	0	0	2.8	11.0	44.6
i-02	3.3	0	11.5	0.70	12.2	12.1	0	0	0.5	5.5	18.1
i-03	19.9	1.7	61.2	4.6	65.8	70.4		0	5.1	19.3	94.8
i-04	10.5	0	46.5	3.2	49.7	41.8	0	0	2.5	8.3	52.3
in-01	13.9	0	45.6	4.9	50.5	58.3	0	0	2.3	15.2	75.8
x-01	4.7	0	15.5	1.1	16.6	17.6	0	0	0.9	5.1	23.6
x-02a	3.2	0	10.5	0.8	11.3	13.2	0	0	0.5	5.1	18.8
x-02b	3.4	0	11.2	0.6	11.8	11.0	0	0	0.9	5.1	17.0
x-03	5.6	0	18.5	1.1	19.6	19.8	0	0	1.4	10.1	31.3
x-04	22.7	1.7	74.1	4.4	78.5	80.3		0	1.4	30.3	112.0
Quartzsite Zone											
i-05	2.8	0	16.4	1.0	17.4	9.9	0	0	0.5	0.0	10.4
qn-01	0.6	0	1.9	0.3	2.2	3.3	0	0	0.9	0.0	4.2
qn-02	10.8	0	35.6	2.7	38.3	40.7		0	2.3	15.2	58.2
qs-01	3.1	0	10.1	0.7	10.7	11.0	0	0	0.5	5.1	16.6
qs-02	4.8	0	15.7	1.3	17.0	18.7		0	2.5	7.4	28.6
x-05	10.2	0	44.1	2.1	46.2	38.5	0	0	5.5	11.5	55.5
x-06	9.2	0	48.7	3.4	50.8	33.0	0	0	3.7	14.7	51.4
x-07	7.7	0	25.3	1.7	27.0	28.6	0	0	2.1	10.1	40.8
Copper Bottom											
cb-01	3.2	0	15.5	1.7	17.2	16.5	0	43.5	1.6	7.4	69.0
cb-02	2.2	0	0.0	1.3	1.3	12.1	0	43.5	0.0	7.4	63.0
cb-03	4.3	0	14.2	2.0	16.2	18.7	0	0	0.9	5.1	24.7
cb-04	1.9	0	12.4	0.6	12.8	5.5	0	0	0.0	2.3	7.8
cb-05	4.4	0	24.1	2.0	25.1	18.7	0	0	1.8	5.1	25.6
cb-06	1.9	0	13.6	0.9	14.0	8.8	0	0	0.5	6.9	16.2
i-06	7.2	0	23.7	2.4	26.1	28.6	0	0	0.5	10.1	39.2

SEGMENT	LONG-TERM DISTURBANCE (ACRES)					SHORT-TERM DISTURBANCE (ACRES)					
	LINE MILES	SCS	ACCESS ROADS	STRUC-TURES	TOTAL LONG-TERM DISTURBANCE	STRUC-TURES	MATERIAL STAGING AREA	HELI-COPTER	GUARD CROSS-INGS	SNUBBING AND PULLING SITES	TOTAL SHORT-TERM DISTURBANCE
i-07	6.3	0	20.7	1.5	22.2	24.2	0	0	0.9	10.1	35.2
x-08	1.3	0	4.3	0.5	4.8	5.5	0	0	0.5	0	6.0
Colorado River and California Zone											
cb-10	1.9	0	6.2	0.8	7.0	8.8	0	0	1.1	2.3	12.2
i-08s	1.3	0	4.3	0.6	4.9	6.6	0	0	0.9	0.0	7.5
ca-01	6.7	0	21.8	1.8	23.6	28.6		0	6.4	10.1	45.1
ca-02	3.4	0	11	1.0	12.0	14.3	0	0	1.8	5.1	21.2
ca-04	0.4	0	1.1	0.2	1.3	2.2	0	0	0.9	0.0	3.1
ca-05	6.6	0	21.8	1.8	23.6	28.6		0	4.8	10.1	43.5
ca-06	2.8	0	11.2	1.1	12.3	11.0	0	0	2.3	4.6	17.9
ca-07	3.0	0	12.5	0.9	13.4	12.1	0	0	0.9	2.8	15.8
ca-09	2.6	0	8.7	0.6	9.3	9.9	0	0	0.0	6.8	16.7
x-09	0.8	0	2.6	0.4	3.0	4.4	0	0	0.5	2.3	7.2
x-10	1.3	0	4.1	0.4	4.5	5.5	0	0	0.7	0	6.2
x-11	2.1	0	6.9	0.6	7.5	7.7	0	0	1.6	5.1	14.4
x-12	1.3	0	8.8	0.5	9.3	4.4	0	0	1.8	2.3	8.5
x-13	2.0	0	3.8	0.8	4.6	7.7	0	0	1.8	2.3	11.8
x-15	1.4	0	4.8	0.5	5.3	6.6	0	0	0.0	4.6	11.2
x-16	2.3	0	7.1	0.5	7.6	8.8	0	0	0.0	6.2	15.0
x-19	1.0	0	5.3	0.6	5.9	5.5	0	0	0.7	6.9	13.1
Other											
Alt SCS & Subst. Upgrades	N/A	N/A	N/A	<0.1	<0.1	N/A	24	N/A	N/A	N/A	24
Alt. SCS dist. Line	3.1	N/A	N/A	<0.1	<0.1	0.8	N/A	N/A	0.5	N/A	1.3

Temporary use areas would be disturbed during construction, their use would be temporary, and the acreage reclaimed; however, due to the desert environment, the disturbance effects may be long term. Temporary impact areas include a20 percent buffer addition for final design considerations (200' x 200' = 0.9 acre + 20% = 1.1 acre).

SCS and Material Staging assigned to incompatible segments so that an evaluation of every possible alignment gets the same impacts. For example, segment ca-01 and ca-05 are incompatible and could not both be used in a complete route.

N/A – Not applicable

2.4.6 Alternative Segments Considered but Eliminated from Detailed Analysis

Alternative segments were identified by BLM through a combination of both internal and public scoping (Table 2.4-1). Public scoping comments that resulted in alternative segments being identified included: segments that avoid the Town of Quartzsite, segments within BLM utility corridors, segments that avoid sensitive cultural resources, and segments that avoid Johnson Canyon and the Kofa NWR. Public scoping also raised other potential alternatives that did not result in alternative segments being identified, since the suggested alternative was either not applicable (i.e., the Proposed Action segments already avoided WAs) or not relevant to the Project (i.e., development of a route and substation for the Brenda Solar Energy Zone). Additional information regarding alternative development and screening is provided in the Project record.

Screening of the alternative segments against screening criteria identified alternative segments, or portions thereof, that did not meet the criteria for reasonable alternatives, and therefore, these alternative segments will not be carried forward for detailed analysis (Table 2.4-11) (Appendix 1, Figures 2.4-6 through 2.4-9). A complete explanation of the alternative segments considered but eliminated from detailed analysis is provided in the project record.

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Table 2.4-11 Alternative Segments Eliminated from Detailed Analysis

ALTERNATIVE/ SEGMENT (LENGTH IN MILES)	ALTERNATIVES SCREENING CRITERIA					REASON ELIMINATED FROM DETAILED ANALYSIS
	SEGMENT DESCRIPTION	CONSISTENT WITH PURPOSE AND NEED?	TECHNICALLY FEASIBLE?	ECONOMICALLY FEASIBLE?	ENVIRONMENTALLY SUPERIOR?	
East Plains & Kofa Zone						
ASLD-A (21.4)	Alternative to Segment p-06, x-04. Connects the Proposed Action to segments paralleling I-10; avoids the Kofa NWR. Suggested by Arizona State Land Department (ASLD) to avoid Arizona state trust land parcels near I-10. Follows existing Kinder Morgan–El Paso Natural Gas pipeline; could share access to reduce disturbance.	Yes	Yes	Yes	No, would have similar impacts to Segment x-04, but slightly longer/less direct. Segment x-04 would better utilize existing access along the gas pipeline road.	Segment x-04 would be superior.
BLM-1 (21.8)	Alternative to Segments p-01, d-01 Parallels I-10 on south side Almost entirely on Arizona state trust and private land; within utility corridor on BLM-administered land.	Yes	Yes	Yes	No, although this segment would be shorter and would have 2 less crossings of I-10 and the CAP than the Proposed Action (p-01), it would require more new disturbance and new access as compared to the Proposed Action (p-01) and d-01, which parallel existing linear utilities with existing access. Also, this segment would require an unreasonable amount of negotiations with numerous private landowners, as well as ASLD; thus, it is not considered superior to the corresponding segments of the Proposed Action.	Segment p-01 or d-01 would be superior since they parallel existing utilities.
BLM-4 (32.3)	Alternative to Segments p-02 through a portion of p-06; i-01 through i-03. Parallels I-10 on north side; within utility corridor on BLM-administered lands.	Yes	Yes	Yes	No, would avoid impacts to scenic views looking south from I-10 toward Courthouse Rock, the New Water Mountains Wilderness, and the Kofa NWR. Views along I-10 are more scenic to the south than the north and travelers on I-10 tend to look to the south; would parallel the CAP, which is prominent linear feature visible to the north. Would place the Alternative Series Compensation Station north of I-10, which could save a future I-10 crossing to connect to the Brenda SEZ. However, would cross both Category 2	Would impact higher quality tortoise habitat and impact other sensitive habitat more than other alternatives. La Paz County adamantly requires the line to be sited on the south side of I-10, due to their economic feasibility issues on record.

ALTERNATIVE/ SEGMENT (LENGTH IN MILES)	ALTERNATIVES SCREENING CRITERIA					REASON ELIMINATED FROM DETAILED ANALYSIS
	SEGMENT DESCRIPTION	CONSISTENT WITH PURPOSE AND NEED?	TECHNICALLY FEASIBLE?	ECONOMICALLY FEASIBLE?	ENVIRONMENTALLY SUPERIOR?	
					and 3 Sonoran desert tortoise habitat, while Segment i-03 south of and parallel to I-10 would only cross Category 3 habitat. Arizona Game and Fish Department (AGFD) stated there is more sensitive habitat on the north side and prefers this segment not go forward.	
Quartzsite Zone						
XA (9.6)	Alternative to Segments i-05, qn-01 and a portion of qn-02; qs-01 and qs-02. Developed as conceptual route around north side of the Town of Quartzsite; replaced by qn-02.	Yes	Yes	Yes	No, qn-02 follows the existing WAPA 161kV transmission line and would reduce impacts by co-locating facilities and sharing access.	Replaced by Segment qn-02.
XB (2.0)	Alternative to Segment p-09, qn-02. Originally part of Segment qs-02, but qs-02 revised to dip south to avoid Quartzsite developed area.	Yes	Yes	Yes	No, the segment would have visual and land use impacts to densely developed areas on the southwest side of Quartzsite, including residential areas, as well as popular OHV routes and dispersed camping areas immediately south.	Replaced by eastern portion of Segment qs-02 on BLM lands.
XC (5.5)	Alternative to Segments x-07, x-08. Within designated but as-yet undeveloped utility corridor; corridor is currently under review regarding whether it will continue as a corridor.	Yes	Yes	Yes	No, due to very steep and rugged topography, would result in impacts to vegetation and topography in this undisturbed area. Also, there are numerous mining claims in the area which may make route infeasible. Segments x-07 or x-08 would provide easier connection between the Proposed Action route and an I-10 route with less impacts and more certainty.	Segments x-07 or x-08 would be superior.
Copper Bottom Zone						
BLM-3 (1.6)	Alternative to Segment x-08. Connector between the I-10 and Proposed Action routes without right angle turns.	Yes	Yes	Yes	No, challenging terrain would incur more impacts to the natural topography, soils, etc. Segment x-08 offers a shorter route with less challenging terrain and portions of which are in previously disturbed areas, resulting in fewer impacts to vegetation and topography.	Segments x-08 would be superior.

ALTERNATIVE/ SEGMENT (LENGTH IN MILES)	ALTERNATIVES SCREENING CRITERIA					REASON ELIMINATED FROM DETAILED ANALYSIS
	SEGMENT DESCRIPTION	CONSISTENT WITH PURPOSE AND NEED?	TECHNICALLY FEASIBLE?	ECONOMICALLY FEASIBLE?	ENVIRONMENTALLY SUPERIOR?	
cb-07 (2.8)	Alternative to Segments p-10/p-11/p-12; cb-01, cb-02.	Yes	Yes	Yes	Avoids crossing Cunningham Peak, Johnson Canyon, and Copper Bottom Pass, but the terrain is challenging and would result in more impacts than Proposed Action. Also, this segment could negatively impact the YPG mission by placing road and structures near YPG boundary.	Segments dropped through coordination between BLM and YPG management due to potential national security impacts.
cb-08 (3.0)	Alternative to Segments p-10/p-11/p-12; cb-04.	Yes	Yes	Yes	Avoids crossing Cunningham Peak, Johnson Canyon, and Copper Bottom Pass, but the terrain is challenging and would result in more impacts than Proposed Action. Also, this segment could negatively impact the YPG mission by placing road and structures near YPG boundary.	Segments dropped through coordination between BLM and YPG management due to potential national security impacts.
cb-09 (7.7)	Alternative to Segments p-13, cb-05.	Yes	Yes	Yes	Avoids crossing Cunningham Peak, Johnson Canyon, and Copper Bottom Pass, but the terrain is challenging and would result in more impacts than Proposed Action or cb-05. Also, this segment could negatively impact the YPG mission by placing road and structures near YPG boundary.	Segments dropped through coordination between BLM and YPG management due to potential national security impacts.
XD (4.0)	Attach transmission line to existing DPV1 structures through Copper Bottom Pass.	No, the segment would not meet the CAISO requirement of a 250-foot separation from DPV1.	Yes	Yes	Yes, would eliminate disturbance from new structures and eliminate or substantially reduce disturbance for new access routes.	Eliminated because it would not meet the CAISO requirements for the Project, to maintain separation between the Project and the existing DPV1 Transmission Line.
XF (1.6)	Alternative to Segment x-08.	Yes	Yes	Yes	No, Segment x-08 would be shorter, with fewer impacts, and be easier to construct.	Segment x-08 would be superior.
Colorado River and California Zone						
ca-03 (3.5)	Alternative to Segments p-17, ca-07/ca-08/ca-09.	Yes	Unknown at this time; would require negotiation with Desert Quartzite Solar Project, could adversely impact the solar project's planned operations. Desert Quartzite Solar Project is presently	Yes	Yes, partially within a utility corridor and would cross lands already dedicated to industrial facility, reducing new disturbance/impacts. But would require Desert Quartzite Solar Facility to revise planned facility layout, negatively affecting operations.	Due to uncertainty with solar facility, would not be superior to Proposed Action or ca-07/ca-08/ca-09.

ALTERNATIVE/ SEGMENT (LENGTH IN MILES)	ALTERNATIVES SCREENING CRITERIA					REASON ELIMINATED FROM DETAILED ANALYSIS
	SEGMENT DESCRIPTION	CONSISTENT WITH PURPOSE AND NEED?	TECHNICALLY FEASIBLE?	ECONOMICALLY FEASIBLE?	ENVIRONMENTALLY SUPERIOR?	
			under environmental analysis by the BLM.			
ca-08a (1.4)	Alternative to Segments p-17/p-18, ca-07.	Yes	No, crosses through the existing NRG Blythe solar facility; there is not sufficient space for the ROW.	No, would require extensive redesign of the NRG Blythe solar facility to accommodate the power line.	Yes, partially within a utility corridor and crosses industrialized area.	Replaced by ca-07 once conflict with existing NRG Blythe solar facility was identified.
ca-08b (2.9)	Alternative to Segments p-17/p-18, ca-09.	Yes	No, would conflict with gen-tie lines for proposed/approved solar facilities in the area; there is not sufficient space for the ROW.	Yes	Yes, partially within a utility corridor and crosses industrialized area.	Eliminated because of technical and safety conflicts with solar facility gen-tie lines. Replaced by ca-09.
i-08e (0.8)	Alternative to Segments p-15e, i-08s. Adjacent to I-10, offset to south; east of Colorado River.	Yes	No, there is not sufficient space for the ROW.	Yes	No, would require relocation of residences. Existing pipeline crossing and related appurtenances, RV park, and a residential community limits available area. There are three other river crossings that would have fewer impacts to existing development.	Eliminated due to insufficient space for the ROW.
i-08wa (0.3) **i-08wb** (0.9)	Alternative to Segments p-15e, i-08s, i-08sw, ca-04, x-09. Adjacent to I-10, offset to south; west of Colorado River.	Yes	No, there is not sufficient space for the ROW.	Yes	Yes	Eliminated due to insufficient space for the ROW.
i-08sw (0.7)	Alternative to Segment i-08s.	No, segment was stranded after elimination of segments i-08e and i-08wa.	Yes	Yes	Yes	Eliminated because it became stranded with the elimination of connecting segments.
i-09a (1.2)	Alternative to Segments i-08s/ca-04/x-09.	No, segment was stranded after elimination of Segments XGa and i-09b.	Yes	Yes	Yes	Eliminated because it became stranded with the elimination of connecting segments.
i-09b (1.6)	Alternative to Segments p-16, ca-02, and ca-06.	Yes	No, is within the Blythe Airport Influence Area, where structure heights are limited.	Yes	Yes	Eliminated due to technical infeasibility.
i-09c (0.3)	Connector between i-09a and i-10 or x-14.	Yes	No, is within the Blythe Airport Influence Area, where structure heights would be limited, rendering the route infeasible.	Yes	N/A	Eliminated due to technical infeasibility.

ALTERNATIVE/ SEGMENT (LENGTH IN MILES)	ALTERNATIVES SCREENING CRITERIA					REASON ELIMINATED FROM DETAILED ANALYSIS
	SEGMENT DESCRIPTION	CONSISTENT WITH PURPOSE AND NEED?	TECHNICALLY FEASIBLE?	ECONOMICALLY FEASIBLE?	ENVIRONMENTALLY SUPERIOR?	
i-10 (3.6)	Alternative to Segments p-17/p-18, ca-07/ca-09.	Yes	No, would require crossing existing transmission lines, going above some lines and under others, in a manner that would not be technically feasible, and given consideration for safety. Additionally, the route would be located within the Blythe Airport Influence Area, where some structure heights would be limited, rendering the route infeasible.	Yes	N/A	Eliminated due to technical infeasibility.
i-11 (3.7)	Alternative to Segments p-17/p-18, ca-09.	Yes	No, would require crossing multiple existing transmission lines, going above some lines and under others, in a manner that would not be technically feasible.	Yes	N/A	Eliminated due to technical infeasibility.
i-12a (1.4)	Alternative to Segments p-17, ca-07.	No, segments i-09b, i-09c, i-11, and x-18 were eliminated, leaving the segment stranded.	No, portions would be within the Blythe Airport Influence Area, where structure heights would be limited, rendering the route infeasible.	Yes	N/A	Eliminated due to technical infeasibility and because connecting segments were eliminated.
i-12b (1.1)	Alternative to Segment XGb.	No, segments i-12a and i-12c were eliminated, leaving the segment stranded.	No, portions would be within the Blythe Airport Influence Area, where structure heights would be limited, rendering the route infeasible.	Yes	Yes	Eliminated due to technical infeasibility and because connecting segments were eliminated.
i-12c (1.8)	Alternative to Segments p-17, ca-07.	No, because Segments i-09b, i-09c, i-11, i-12a, i-12b, and x-18 were eliminated, leaving the segment stranded.	Segment may also have failed due to structure height limitations within the Blythe Airport Influence Area.	Yes	Yes	Eliminated because connecting segments were eliminated.
XGa (6.6)	Alternative to Segments p-15w, ca-01, ca-05.	No, Segments i-08wb and x-21 were eliminated, leaving the segment stranded.	Yes	Yes	No, segment would cross through the congested Blythe business district along I-10. High density areas are more challenging: more infrastructure, safety clearance issues, and angle structures are required.	Eliminated because connecting segments were eliminated. Replaced by alternative segments further south of and following the I-10 corridor that would have fewer adverse impacts.
XGb	Alternative to Segment i-12b.	Yes	No, would be within the Blythe Airport Influence Area, where	Yes	N/A	Eliminated due to technical infeasibility.

ALTERNATIVE/ SEGMENT (LENGTH IN MILES)	ALTERNATIVES SCREENING CRITERIA					REASON ELIMINATED FROM DETAILED ANALYSIS
	SEGMENT DESCRIPTION	CONSISTENT WITH PURPOSE AND NEED?	TECHNICALLY FEASIBLE?	ECONOMICALLY FEASIBLE?	ENVIRONMENTALLY SUPERIOR?	
(1.0)			structure heights would be limited, rendering the route infeasible.			
x-14 (1.4)	Alternative to Segments i-08s/ca-04/x-09.	No, it became stranded with the elimination of Segments i-09b and i-09c, and i-10.	Yes	Yes	Yes	Eliminated because connecting segments were eliminated.
x-17a (0.4) **x-17b** (1.3) **x-17c** (0.4)	Alternative to Segments x-14 and x-18a & b.	Yes	No, Segment x-17b conflicts with the existing NRG Blythe solar facility operations that wasn't identified until after the segment was sited.	Yes	Yes	Eliminated due to technical infeasibility.
x-18a (0.9) **x-18b** (0.2)	Together, alternative to Segments i-08s, x-14 and i-11.	No, eliminated because it became stranded with the elimination of Segments i-10, i-11, and i-12a, b, and c.	Yes	Yes	Yes	Eliminated because connecting segments were eliminated.
x-20 (1.2)	Alternative to Segment x-19.	No, eliminated because it became stranded with the elimination of Segment i-11.	Yes	Yes	Yes	Eliminated because connecting segments were eliminated.
x-21 (1.5)	Alternative to i-08s/ca-04/x-09.	No, eliminated because it became stranded with the elimination of Segments i-08wa & b.	Yes	Yes	Yes	Eliminated because connecting segments were eliminated.

2.4.7 Alternative and Subalternative Routes

Four full Alternative Routes (Alternative Routes 1 through 4) to the Proposed Action (Appendix 1, Figure 2.4-10) were developed by selecting proposed and alternative segment combinations within each zone that linked together logically and also met certain objectives of the BLM, cooperating agencies, and stakeholders, and potentially addressed public concerns with the Proposed Action. The four full Alternative Routes represent the best combination of segments to achieve the objectives presented in the following sections. In addition to the Proposed Action or the No Action Alternative, the BLM may select one of these Alternative Routes, or a combination thereof, to be the Agency Preferred Alternative.

Subalternatives within each zone consisting of one or more segments were also developed that could replace a portion of one of the full Alternative Routes. The Subalternatives provide localized variations to the full Alternative Routes that could be used to reduce impacts or address issues with the full Alternative Routes.

2.4.7.1 Alternative 1: I-10 Route

Alternative 1 would be 111.6 miles long and would generally follow I-10 (Appendix 1, Figure 2.4-11; Table 2.4-12). This alternative route was developed to utilize BLM utility corridors while avoiding the Kofa NWR, Johnson Canyon, YPG, Copper Bottom Pass area, and the area of dense cultural resources in Mule Mountains south of Blythe; and also meet public request for a route that follows I-10 and minimize crossings of VRM Class II land.

Table 2.4-12 Alternative 1 Jurisdiction

LAND MANAGEMENT LANDS CROSSED	MILES (#)	% OF TOTAL ROUTE DISTANCE
BLM	58.8	52.7
USFWS	0	0
Reclamation	6.4	5.7
DOD	0	0
State Trust	19.4	17.4
Private	25.6	22.9
Indian Lands	1.4	1.3
Total length of route:	111.6	100.0

Alternative 1 would include the segments listed in Table 2.4-13; segment descriptions are provided in the respective zone tables.

Table 2.4-13 Alternative 1 Segments

SEGMENT TYPE	EAST PLAINS AND KOFA ZONE	QUARTZSITE ZONE	COPPER BOTTOM ZONE	COLORADO RIVER AND CALIFORNIA ZONE
Proposed	p-01	None	None	None
Alternative	i-01 through i-04	i-05, qs-01 and qs-02	i-06 and i-07	i-08s, ca-04. ca-05, ca-06, ca-07, ca-09, x-09 and x-19

The following Subalternatives (Table 2.4-14; Appendix 1, Figures 2.4-12 through 2.4-14) would also meet the objectives of Alternative 1.

Table 2.4-14 Subalternatives Under Alternative 1

SUBALTERNATIVE	SUBALTERNATIVE SEGMENTS	ALTERNATIVE ROUTE SEGMENTS REPLACED	ZONE
1A	p-02, p-03, x-02a and x-02b	i-01	East Plains and Kofa
1B	p-02, x-01, and x-02a	i-01	East Plains and Kofa
1C	in-01	i-04, i-05 (must be combined with 1D)	East Plains and Kofa
1D	qn-01	N/A (must be combined with 1C)	Quartzsite
1E	x-10, ca-01, and x-12	ca-05	Colorado River and California

Subalternative 1C includes a segment in the Lake Havasu Field Office (FO) that crosses VRM Class II designated lands. An amendment to the Lake Havasu RMP (BLM 2007) would be required to change the portion of this segment designated VRM Class II to Class IV within the BLM utility corridor.

2.4.7.2 Alternative 2: BLM Utility Corridor Route

Alternative 2 would be 125.8 miles long and would be primarily within existing BLM utility corridors (Appendix 1, Figure 2.4-15; Table 2.4-15). This alternative route was developed to emphasize the use of BLM utility corridors while avoiding the Kofa NWR, Johnson Canyon, Ehrenberg Sandbowl area, the area of dense cultural resources in Mule Mountains south of Blythe, and residential and other development south of Blythe; minimize impacts to the Colorado River Indian Tribes (CRIT) reservation and use of private land in California; and place the majority of route crossing VRM Class III.

Table 2.4-15 Alternative 2 Jurisdiction

LAND MANAGEMENT LANDS CROSSED	MILES (#)	% OF TOTAL ROUTE DISTANCE
BLM	80.1	63.7
USFWS	0	0
Reclamation	1.7	1.3
DOD	0.2	0.2
State Trust	17.6	14.0
Private	26.2	20.8
Indian Lands	0	0
Total length of route:	125.8	100.0

Alternative 2 would include the segments listed in Table 2.4-16; segment descriptions are provided in the respective zone tables.

Table 2.4-16 Alternative 2 Segments

SEGMENT TYPE	EAST PLAINS AND KOFA ZONE	QUARTZSITE ZONE	COPPER BOTTOM ZONE	COLORADO RIVER AND CALIFORNIA ZONE
Proposed	p-01	None	p-09 through p-14	p-15e, p-15w, p-16
Alternative	i-01 through i-04	i-05, qs-01, x-07	None	x-15 and x-16, ca-07, ca-09, x-19

The following Subalternatives (Table 2.4-17; Appendix 1, Figures 2.4-16 through 2.4.18) would also meet the objectives of Alternative 2, except Subalternative 2D would not avoid CRIT land.

Table 2.4-17 Subalternatives Under Alternative 2

SUBALTERNATIVE	SUBALTERNATIVE SEGMENTS	ALTERNATIVE ROUTE SEGMENTS REPLACED	ZONE
2A	d-01, x-02a, x-02b	p-01, i-01	East Plains and Kofa
2B	p-02, p-03, p-04, x-03	i-01, i-02	East Plains and Kofa
2C	cb-02, cb-04, cb-06	p-11, p-12	Copper Bottom
2D	cb-03	p-11	Copper Bottom
2E	x-13, ca-02	p-16, x-16	Colorado River and California

2.4.7.3 Alternative 3: Avoidance Route

Alternative 3 would be 123.0 miles long and was developed to avoid several areas of concern (Appendix 1, Figure 2.4-19; Table 2.4-18). This alternative route was developed to avoid Kofa NWR Johnson Canyon, the CRIT reservation the Town of Quartzsite and Ehrenberg Sandbowl area, biologically important backwaters of the Colorado River, the southern end of Blythe, and the area of dense cultural resources in Mule Mountains south of Blythe; and place the majority of the route crossing VRM Class III.

Table 2.4-18 Alternative 3 Jurisdiction

LAND MANAGEMENT LANDS CROSSED	MILES (#)	% OF TOTAL ROUTE DISTANCE
BLM	82.6	67.1
USFWS	0	0
Reclamation	0.7	0.6
DOD	0.2	0.2
State Trust	14.0	11.4
Private	25.5	20.7
Indian Lands	0	0
Total length of route:	123.0	100.0

Alternative 3 would include the segments listed in Table 2.4-19; segment descriptions are provided in the respective zone tables:

Table 2.4-19 Alternative 3 Segments

SEGMENT TYPE	EAST PLAINS AND KOFA ZONE	QUARTZSITE ZONE	COPPER BOTTOM ZONE	COLORADO RIVER AND CALIFORNIA ZONE
Proposed	p-01 through p-04	p-07 and p-08	p-09 and p-14	None
Alternative	i-03 and i-04, x-03	x-05	cb-01, cb-04, cb-05	ca-01, ca-06, ca-07, ca-09; cb-10, x-11, x-12, x-19

The following Subalternatives (Table 2.4-20; Appendix 1, Figures 2.4-20 through 2.4-23) would also meet the objectives of Alternative 3.

Table 2.4-20 Subalternatives Under Alternative 3

SUBALTERNATIVE	SUBALTERNATIVE SEGMENTS	ALTERNATIVE ROUTE SEGMENTS REPLACED	ZONE
3A	d-01, x-02a, x-02b, and i-02	p-01, i-01	East Plains and Kofa
3B	i-01 and i-02	p-02, p-03, p-04, x-03	East Plains and Kofa
3C	p-05 and x-04	x-03, i-03	East Plains and Kofa
3D	in-01	i-04 (must be combined with 3F and 3G, or 3H)	East Plains and Kofa
3E	qs-01 and x-07	x-06 (must be combined with 3D and 3G or 3J)	Quartzsite
3F	x-06	x-05 (must be combined with 3D and 3G or 3J)	Quartzsite
3G	qn-01	N/A (must be combined with 3D, 3E, 3F, 3H, and/or 3J)	Quartzsite
3H	qn-02	N/A (must be combined with 3D and 3L)	Quartzsite
3J	i-05	N/A (must be combined with 3E, 3F, or 3G and 3H)	Quartzsite
3K	p-10 and cb-02	cb-01	Copper Bottom
3L	i-06, x-08, p-12, and p-13	p-09, p-10, p-11 (must be combined with 3D and 3H; or 3J, 3G and 3H)	Copper Bottom
3M	p-15e, p-15w, and x-13	cb-10, x-11, ca-01	Colorado River and California

Subalternative 3D includes a route segment in the Lake Havasu FO that crosses VRM Class II designated lands in the Lake Havasu FO. An amendment to the Lake Havasu RMP (BLM 2007) would be required to change the portion of this segment designated VRM Class II to Class IV within the BLM utility corridor.

2.4.7.4 Alternative 4: Public Lands Emphasis Route

Alternative 4 would be 120.3 miles long and generally is on public lands, avoiding state trust and private lands (Appendix 1, Figure 2.4-24; Table 2.4-21). This alternative route was developed to avoid the Kofa NWR, state trust and private land along I-10, the CRIT reservation, the Ehrenberg Sandbowl area, the southern end of Blythe, and the area of dense cultural resources in Mule Mountains south of Blythe; and also maximize use of BLM utility corridors in the Copper Bottom Pass area while placing the majority of route crossing VRM Class III, with slightly less Class II than Alternative Routes 2 or 3.

Table 2.4-21 Alternative 4 Jurisdiction

LAND MANAGEMENT LANDS CROSSED	MILES (#)	% OF TOTAL ROUTE DISTANCE
BLM	84.6	70.3
USFWS	0	0
Reclamation	0.8	0.7
DOD	0.2	0.2
State Trust	6	4.9
Private	28.7	23.9
Indian Lands	0	0
Total length of route:	120.3	100.0

Alternative 4 would include the segments listed in Table 2.4-22; segment descriptions are provided in the respective zone tables.

Table 2.4-22 Alternative 4 Segments

SEGMENT TYPE	EAST PLAINS AND KOFA ZONE	QUARTZSITE ZONE	COPPER BOTTOM ZONE	COLORADO RIVER AND CALIFORNIA ZONE
Proposed	p-04 and p-05	p-08	p-09, p-10, p-13, p-14	p-15e and p-15w
Alternative	d-01, in-01, x-04	qn-01, x-06	cb-02, cb-04, cb-06	ca-06, ca-07, ca-09; x-12, x-13, x-19

The following Subalternatives (Table 2.4-23; Appendix 1; Figures 2.4-25 through 2.4-28) would also meet the objectives of Alternative 4.

Table 2.4-23 Subalternatives Under Alternative 4

SUBALTERNATIVE	SUBALTERNATIVE SEGMENTS	ROUTE SEGMENTS REPLACED	ZONE
4A	p-01, p-02, and p-03	d-01	East Plains and Kofa
4B	x-03 and i-03	p-05, x-04	East Plains and Kofa
4C	i-04	N/A (must be combined with 4J or 4D)	East Plains and Kofa
4D	x-05 and p-07	i-05, x-06 (must be combined with 4C)	Quartzsite
4E	cb-01	p-10, cb-02	Copper Bottom
4F	cb-05	cb-06, p-13	Copper Bottom
4G	p-11 and p-12	cb-02, cb-04, cb-06	Copper Bottom
4H	x-08 and i-07	N/A (must be combined with p-11 and 4K)	Copper Bottom
4J	i-05	N/A (must be combined with 4C)	East Plains and Kofa
4K	i-08s, ca-04, x-09	N/A (must be combined with 4H and 4N)	Colorado River and California
4L	cb-10 and x-11	N/A (must be combined with 4M)	Colorado River and California
4M	ca-01	p-15w (must be combined with 4L)	Colorado River and California
4N	x-10	N/A (must be combined with 4H, 4K, and 4M)	Colorado River and California
4P	p-16, p-17, and p-18	x-13, x-12, ca-06, ca-07, ca-09, x-19	Colorado River and California

Alternative 4 includes a route segment in the Lake Havasu FO that crosses VRM Class II designated lands in the Lake Havasu FO. An amendment to the Lake Havasu RMP (BLM 2007) would be required to change the portion of this segment designated VRM Class II to Class IV within the BLM utility corridor.

2.5 DESCRIPTION OF POTENTIAL RMP AMENDMENT ACTIONS ASSOCIATED WITH THE ACTION ALTERNATIVE SEGMENTS

Some alternative segments may conflict with management prescriptions in one or more RMPs and may include a plan amendment for selection and approval.

2.5.1 Arizona

2.5.1.1 Lake Havasu RMP Amendment

Segment in-01 is the only segment located in the Lake Havasu FO. A portion of this segment crosses VRM Class II designated lands. This Study will determine if the segment would conform to class objectives.

2.5.1.2 Yuma RMP Amendments

ROW Actions – Proposed Plan Amendment

As a result of Management Action LR-031, under the Action Alternatives, amendment of the Yuma RMP would be included to establish a ROW for any segment outside designated BLM utility corridors.

Proposed Plan Amendments for VRM Conformance

As noted in Section 2.2.2.2, this Study will determine whether an RMP Amendment would be included to bring the Project into compliance with VRM Classes specified by the Yuma RMP.

2.5.2 California

2.5.2.1 CDCA Plan of 1980, as Amended

Similar to the Proposed Action, this Study will determine whether the CDCA Plan of 1980, as amended, would be amended for Action Alternative segments crossing BLM-administered public lands in California. While field surveys for Harwood's eriastrum and data analysis would indicate that Segments ca-07, ca-09, p-18, and x-15 would be affected by this amendment (Appendix 1, Figure 3.5-6), modeled habitat for the species (Appendix 1, Figure 3.5-5) indicates that the species could also be found along Segments ca-02, ca-06, p-16, p-17, x-16, and x-19.

Technical Environmental Study
Chapter 3

Ten West Link
500kV Transmission Line Project

Prepared for:

US Department of the Interior

Bureau of Land Management

Yuma Field Office

Prepared By:

Stantec Consulting Services Inc.

2890 East Cottonwood Parkway, Suite 300

Salt Lake City, Utah 84121

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3.0 AFFECTED ENVIRONMENT

3.1 INTRODUCTION

3.1.1 General Setting of Project Area

The Project Area extends across southwestern Arizona into southeastern California. It is within the North American Deserts Ecoregion (Level I division) (Commission for Environmental Cooperation no date [n.d.]) and the Sonoran Basin and Range subdivision (Level III division) (EPA 2013a), which is distinguished by palo verde-cactus vegetation including saguaro, cholla, and agave cacti. This region has large tracts of Federally owned lands. Winter rainfall decreases from west to east, while summer rainfall decreases from east to west (EPA 2013b). The climate is characterized by being the driest in the US.

The Project Area is within the Basin and Range Physiographic Province, Sonoran Desert subdivision, with approximately 20 percent mountains and 80 percent plains. The topography is characterized by mountain ranges that are roughly parallel. The basins between the ranges are relatively flat with gentle slopes next to the mountains (Fenneman 1931), that vary from hills and buttes up to mountains rising 4,000 feet above sea level (asl). The desert plains mostly lie below 2,000 feet elevation (Fenneman 1931).

The economy of the region has historically been based on irrigated agriculture, livestock grazing, and mining (Commission for Environmental Cooperation 1997). Federal and state trust lands include commercial, recreational, range, and undeveloped lands. Private land includes residential, commercial, industrial, and undeveloped areas. The primary types of land within the study areas and adjacent to the Project Area are undeveloped lands and rural areas. The Project location is shown in Figure 1.1-1 (Appendix 1).

3.1.2 Resources Brought Forward for Analysis

Based on internal (agency and cooperator) and external (public) scoping, or issue identification, a number of issues and concerns were identified for analysis in this Technical Environmental Study.

For this analysis, the following resources and uses are presented in this Technical Environmental Study:

- Air Quality and Climate Change, presented in Section 3.2
- Geology, Minerals, and Soil Resources, presented in Section 3.3
- Paleontological Resources, presented in Section 3.4
- Biological Resources, including Special Status Wildlife and Plant Species, Migratory Birds, Vegetation Communities, and Noxious and Invasive Weeds presented in Section 3.5
- Cultural Resources, presented in Section 3.6
- Concerns of Indian Tribes, presented in Section 3.7

- Land Use and Agriculture, presented in Section 3.8
- Wild Horses and Burros, presented in Section 3.9
- Recreation, presented in Section 3.10
- Special Designations, Management Allocations, and Wilderness Resources presented in Section 3.11
- Noise, presented in Section 3.12
- Hazards and Hazardous Materials, presented in Section 3.13
- Public Health, Safety, and Utilities, presented in Section 3.14
- Socioeconomics, presented in Section 3.15
- Environmental Justice, presented in Section 3.16
- Traffic and Transportation, presented in Section 3.17
- Visual Resources, presented in Section 3.18
- Water Resources (Surface and Groundwater), presented in Section 3.19
- Cumulative Projects, presented in Section 3.20

The analysis area varies by resource value or use, depending on the geographic extent of the resource or use and the extent of the effects of the Proposed Action and Action Alternatives on a resource or use. In some cases, the analysis area is the Project Area (e.g., paleontological resources), because that is the extent of the effects of the Project on the resource. In other cases, the analysis area is much larger, encompassing larger administrative or natural boundaries (e.g., social and economic conditions, or wildlife and habitat), because the effects on the resource extend beyond the Project Area boundary. The analysis area is typically referred to as the study area.

In describing the affected environment and existing conditions, the geographic direct impact study area for all resources except those listed below is a 4,000-foot-wide corridor encompassing the segments.

Study area exceptions include:

- Air quality: based on regional airshed (approximately 31 miles off centerline)
- Paleontological Resources: 2-mile corridor
- Biological Resources: 2-mile corridor
- Cultural Resources: 1-mile corridor, 10-mile visual corridor for known sensitive Native American locations
- Recreation: 2-mile corridor
- Hazards and Hazardous Materials: 1-mile corridor
- Socioeconomics: county level only; no "corridor"
- Environmental Justice: 1-mile corridor

- Transportation: 5 miles off centerline; 10-mile corridor (needs to include all new access roads)
- Visual resources: 5 miles off centerline; 10-mile corridor

Where a study area did not include the alternative SCS 12kV distribution line[1] (such as the 4,000-foot corridor encompassing the segments), the study area also included a 200-foot corridor along the length of the SCS alternative 12kV distribution line.

In the following sections, current conditions are characterized within these study areas. The study areas were determined to allow routing flexibility for final design, to allow adequate geographic coverage for where direct and indirect impacts could occur, and to characterize the broader environment where the Project would be located.

3.1.3 Application of Zones by Resource

The Project Area was divided into four zones. By delineating zones, existing conditions and impacts common to all segments within a zone can be identified and then conditions specific to each zone and alternative segment can be identified. Alternative segments in a zone are alternatives to each other and can be organized into alternative routes through the zone. Zone descriptions and segment descriptions and jurisdictions are presented in Chapter 2. Figures showing the segments are provided in Appendix 1.

Some resources do not lend themselves to being broken out by zone, such as Air Quality, Socioeconomics, and Environmental Justice.

3.2 AIR QUALITY AND CLIMATE CHANGE

3.2.1 Applicable Laws, Regulations, Policies, and Plans

Air pollutants are regulated at the national, state, air basin, and county levels; each regulating agency has a different level of regulatory responsibility. The EPA regulates at the national level. The Arizona Department of Environmental Quality (ADEQ) Air Quality Division and the California Air Resources Board (CARB) regulate at the state level. The Mojave Desert Air Quality Management District (MDAQMD) regulates at the air basin level, and the Maricopa County Air Quality Department regulates at the county level. This study area is subject to applicable state implementation plans (SIPs) for air quality, Federal general conformity emission thresholds, and local requirements within the geographic areas crossed by the Proposed and Alternative segments.

The following Federal, state, and local laws, regulations, and standards govern air quality and climate change across the study area, as do relevant BLM plans and policies.

[1] Unlike the alternative SCS 12kV distribution line, the Proposed Action SCS distribution line would be within the ROW of Segment p-06. Therefore, it is not described in Chapter 3 or Chapter 4 separately.

3.2.1.1 Federal

The following sections list for context all Federal, state, and local laws, regulations, and standards that are relevant to the protection of air quality in the air quality study area. Those laws, regulations, and standards that are most relevant are described in detail.

- Clean Air Act (CAA) (42 US Code [USC] 7401 et seq.)
- CAA of 1990, as amended
- General Conformity Rules (40 Code of Federal Regulations [CFR] Part 93, Subpart B)
- Prevention of Significant Deterioration (40 CFR 52.21)
- EPA's Endangerment and Cause and Contribute Findings (EPA 2009)
- Federal Mandatory Reporting of Greenhouse Gases (40 CFR Part 98)
- Visibility Protection Regulations (40 CFR 51, Subpart P)

Under the CAA, the EPA establishes National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants, which are the pollutants considered to be the most pervasive and of the greatest concern nationwide. The current NAAQS are summarized in Table 3.2-1. Note that the current ozone (O_3) NAAQS of 70 parts per billion (ppb) (0.070 parts per million [ppm]) was established in October 2015, and the EPA recently developed initial attainment/nonattainment designations in all states with respect to the new standard on April 30, 2018. The NAAQS include both primary and secondary standards. Primary standards provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

Table 3.2-1 National Ambient Air Quality Standards

POLLUTANT	AVERAGING PERIOD	STANDARD	UNITS
Nitrogen dioxide (NO_2)	1 hour[a] Annual[b]	100 53	ppb ppb
Carbon monoxide (CO)	1 hour[c] 8 hours[c]	35 9	ppm ppm
Sulfur dioxide (SO_2)	1 hour[d] 3 hours[d]	75 0.5	ppb ppm
Particulate matter up to 10 micrometers in size (PM_{10})	24 hours[e]	150	μg/m³
Particulate matter up to 2.5 micrometers in size ($PM_{2.5}$)	24 hours[f] Annual[b]	35 12	μg/m³ μg/m³
Ozone (O_3)	8 hours[g]	0.070	ppm
Lead (Pb)	3 months[h]	0.15	μg/m³

Source: Title 40 CFR Part 50

Notes: ppb = parts per million, ppm = parts per million, μg/m³ = micrograms per cubic meter.

[a]The 1-hour NO_2 primary standard is met when the 3-year average of the annual 98th percentile of the daily maximum. 1-hour average concentration is less than or equal to 100 ppb.

[b]Annual arithmetic mean (primary and secondary standard).

[c]Maximum concentration not to be exceeded more than once per year (primary standard).

[d]The 1-hour SO_2 standard is met when the 3-year average of the annual 99th percentile of the daily maximum 1-hour average concentration is less than or equal to 75 ppb. The 1-hr NAAQS is a primary standard and the 3-hr is secondary.

[e]The 24-hour average PM_{10} standard is attained when the expected number of exceedances per year is less than or equal to one. (primary and secondary standard).

[f]The 24-hour average $PM_{2.5}$ standard is attained when the average of the annual 98th percentile concentrations over a 3-year period is less than or equal to 35 μg/m³. (primary and secondary standard).

[g]The O_3 standard is attained when 3-year average of the calendar year fourth-highest daily maximum 8-hour average O_3 concentration measured at each monitor within an area does not exceed 0.070 ppm (2015 O_3 NAAQS). Note that current attainment/nonattainment status in the study area is designated with respect to the prior (2008) O_3 NAAQS. Designations with respect to the 2015 O_3 NAAQS have not yet been established. (primary and secondary standard).

[h]Maximum arithmetic mean averaged over a 3-month period.

Criteria Air Pollutant Effects

Ozone

Ground-level O_3 is a primary constituent of smog and is a pollution problem in many areas of the US, especially landlocked areas surrounded by mountainous terrain. Exposures to O_3 can make people more susceptible to respiratory infection, cause lung inflammation, and aggravate preexisting respiratory diseases such as asthma. O_3 is formed as volatile organic compounds (VOCs) and nitrogen oxides (NO_x) react in the presence of sunlight. Transportation sources emit VOCs and NO_x and can therefore affect O_3 concentrations. However, because of the phenomenon of atmospheric formation of O_3 from chemical precursors, concentrations are not expected to be elevated near roadways or near construction equipment activity.

The Environmental Protection Agency (EPA) has set the latest (2015) O_3 NAAQS to be protective of human health and welfare (including crops). The latest monitoring data in the study area show O_3 continuing to decline, and data for the 3-year period of 2014-2016 shows compliance with the NAAQS by a slight margin. EPA criteria documents that support the selection of the NAAQS discuss the impact of elevated ozone levels on human health and welfare. The human health impact assessment is the basis for the "primary" NAAQS and the welfare impact assessment (including crops and other vegetation effects) is the basis for the "secondary" NAAQS. The primary and secondary NAAQS were both set at 70 ppb by EPA for the 2015 O_3 NAAQS. Current ozone levels are slightly above this standard generally in the Phoenix metropolitan areas, and generally slightly below the standard in the rural areas such as the proposed Project corridor.

It is well established that ozone is affected not only by emissions of precursor pollutants, but by air temperatures, with higher temperatures tending to promote the formation of more ozone. For areas where either global climate or regional climate (e.g., urban heat island effects) changes cause an increase in especially summertime (ozone season) temperatures, this would tend to increase ozone concentrations.

Particulate Matter
Particulate matter (PM) is the term for particles and liquid droplets suspended in the air. Particles come in a variety of sizes and have been historically assessed based on size, typically measured by the diameter of the particle in micrometers. $PM_{2.5}$, or fine particulate matter, refers to particles that are 2.5 micrometers or less in diameter. PM_{10} refers to particulate matter that is 10 micrometers or less in diameter.

Motor vehicles (e.g., cars, trucks, and buses) and construction equipment emit direct PM from their tailpipes, as well as from normal brake and tire wear. Vehicle dust from paved and unpaved roads can be re-entrained, or re-suspended, in the atmosphere. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as sulfur dioxide (SO_2), NO_x, and VOCs. $PM_{2.5}$ can penetrate the human respiratory system's natural defenses and damage the respiratory tract when inhaled. Numerous scientific studies have linked particle pollution exposure to a variety of problems, including:

- Increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing;
- Decreased lung function;
- Aggravated asthma;
- Development of chronic bronchitis;
- Irregular heartbeat;
- Nonfatal heart attacks; and
- Premature death in people with heart or lung disease.

Nitrogen Oxides
NO_x is the generic term for a group of highly reactive gases, all of which contain nitrogen and oxygen in varying amounts. NO_x forms when fuel is burned at high temperatures, as in a combustion process. The primary sources of NO_x are motor vehicles, electric utilities, and other

industrial, commercial, and residential sources that burn fuels. In addition to being a precursor to O_3, NO_x can worsen respiratory irritation and increase the risk of premature death from heart or lung disease.

Sulfur Dioxide

SO_2 and other sulfur oxide gases (SO_x) are formed when fuel containing sulfur, such as coal and fuel oils, is burned. SO_2 is a heavy, pungent, colorless gas. Elevated levels can impair breathing, lead to other respiratory symptoms, and at very high levels can aggravate heart disease. People with asthma are most at risk when SO_2 levels increase. Once emitted into the atmosphere, SO_2 can be further oxidized to sulfuric acid, a component of acid rain. SO_2 emissions from on-road and non-road engines have been dramatically reduced in the last two decades because of phased-in EPA standards to restrict the amount of sulfur in liquid fuels.

Lead

Due to the phase-out of leaded gasoline, lead is no longer a pollutant associated with vehicular emissions. Lead concerns in the environment are primarily a result of legacy usage of lead in paints and other coatings on structures and contaminated sites near former lead smelters.

Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless gas emitted mainly by combustion processes. CO has historically been primarily a traffic-related pollutant. Traffic-related CO emissions had been responsible for noncompliance with the NAAQS in many metropolitan areas nationwide 20 to 30 years ago. However, because of stricter emissions standards and associated implementation of improved combustion efficiency and catalytic converters on most new on-road and non-road vehicle engines, all metropolitan areas of the country now meet the NAAQS for CO. Most concerns with CO in the US are now related to indoor air pollution, caused mainly by malfunctioning heaters and furnaces, which cause a substantial number of deaths and injuries each year.

Diesel Emissions

There are several regulations at the Federal level intended to reduce emissions related to combustion of diesel fuel in on-road vehicles, non-road vehicles, and portable or stationary non-road engines. Some of these regulations include limits on fuel quality and other requirements that operators must adhere to (e.g., see Federal rules on sulfur levels at 40 CFR part 80). Other regulations include emission limits that are placed on manufacturers of new engines (e.g., see Federal rules at 40 CFR parts 86 and 89). The manufacturer emission limits are met using specialized engine design features and/or post-combustion emission controls, such as catalytic oxidizers, selective catalytic reduction systems, diesel oxidation catalysts, and/or diesel particulate filters. For on-road and non-road equipment involved in Project construction and maintenance activities for Project operation, equipment would be required to meet applicable Federal and state emission standards and fuel requirements. For additional state and local regulations, see Section 3.2.1.2.

Federal General Conformity

The CAA and implementing regulations require certain Federal actions or approvals in areas designated as either nonattainment[2] or maintenance[3] with respect to the NAAQS to confirm that plans and policies facilitate Federal air quality objectives. If a Federal action or approval would result in emissions that exceed general conformity *de minimis* emission thresholds for any affected pollutant, then the responsible Federal agency must coordinate with the EPA and with state and local air quality regulatory agencies to ensure that the excess emissions do not impede plans to maintain acceptable air quality in maintenance areas, or delay implementation of attainment of the NAAQS in nonattainment areas.

Figure 3.2-1 (Appendix 1) shows the only nonattainment or maintenance areas that overlap any of the Proposed and Alternative segments. Approximately 5 to 6 miles of the Proposed and Alternative segments are within the far western end of the Phoenix O_3 nonattainment area, which is classified as a moderate nonattainment area with respect to the 2008 O_3 NAAQS.

Prevention of Significant Deterioration

The CAA divides areas where air quality is already cleaner than required by Federal standards into three classes, and specifies the increments of SO_2, NO_2, and particulate pollution allowed in each class as regulated by the Prevention of Significant Deterioration (PSD) regulations (40 CFR 52.21). Class I areas include international and national parks, many wildernesses, and other pristine areas; allowable increments of new pollution in these areas are very small. Class II areas include all attainment and unclassified areas, which are not designated as Class I; allowable increments of new pollution in these areas are modest. Class III represents selected areas that states may designate for development; allowable increments of new pollution are large (but not exceeding NAAQS). No Class III areas are designated in Arizona and California. All areas not designated as Class I are initially designated as Class II areas. The Project Area is located in a Class II area.

The PSD regulations are applicable to a source pollutant if the source has the potential to exceed the major source thresholds, of either 100 or 250 tons per year (tpy) of a regulated New Source Review pollutant, depending on the type of source pollutant that it is. For stationary source categories listed in the regulation, the threshold is 100 tpy. For source categories that are not listed, such as construction operations, the threshold is 250 tpy. The potential to emit calculation does not include fugitive emissions for the purpose of determining if the facility exceeds the 250 tpy threshold. Fugitive emissions are defined by EPA as "those emissions that could not reasonably pass through a stack, chimney, vent, or other functionally-equivalent opening." The Project is classified under the CAA as a PSD minor source of air quality emissions and would not exceed these thresholds under the PSD regulations because the majority of the Project emissions sources are fugitive in nature and as such are not included in the determination of PSD applicability for a non-listed source category such as construction. Project emissions estimates are included in

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[2] Nonattainment – The classification status of a geographic area where the concentration of one or more criteria pollutants is found to exceed the regulated or "threshold" level for one or more of the NAAQS.

[3] Maintenance – The classification status of a geographic area that was once designated a nonattainment area, but which has decreased its air pollution to, or less than, the NAAQS level for that contaminant.

Section 4.2. It should be noted that minor sources while not subject to PSD regulations can affect increments, but emissions remain below increment thresholds.

Greenhouse Gas Emissions and EPA's Endangerment Finding

Under the EPA's Endangerment Finding, the emissions of several greenhouse gases (GHGs) are subject to tracking and emissions standards as issued by the EPA. These gases include carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and certain other fluorinated GHGs. The only portion of the Federal GHG reporting rule relevant to the Project is 40 CFR 98, Subpart DD, which applies to electrical transmission and distribution equipment use. Subpart DD applies to in-use electrical equipment such as transformers and circuit breakers containing PFCs or SF_6, or servicing containers for such equipment that contain these gases.

Other Federal rules that could affect Project emissions indirectly are the Federal fuel economy standards and renewable fuel standards for highway vehicles. In addition, the EPA's Clean Power Plan is intended to reduce GHG emissions from existing fossil fuel power plants by approximately one-third nationwide, but that rule is currently stayed by the US Supreme Court until litigation is completed.

For the study area and the southwestern US in general, some of the primary concerns regarding climate change are the effects it could have on biodiversity, water management, and wildfire risk. In addition, plant productivity (agriculture crop production), soil loss, and spread of invasive non-native species (e.g., the threat of buffelgrass spreading more broadly into California if the rainfall amounts from the summer monsoon increase) also contribute to climate change.

The greenhouse effect refers to the ability of GHGs to reflect longwave radiation back to the surface, thereby increasing atmospheric temperature. The most prevalent and dominant GHG, in terms of global effects on temperature, is water vapor. CO_2 has a smaller, but significant greenhouse effect, although the effect of CO_2 additions to the atmosphere diminishes logarithmically as the CO_2 concentration increases.

GHGs such as those being regulated by EPA are each assigned a global warming potential (GWP), which is a measure of the heat-trapping (longwave or infrared radiation trapping) effectiveness of the substance in the atmosphere, when compared with CO_2 on a pound-for-pound basis. By definition, the GWP value for CO_2 is equal to 1.0. The GWP for any substance is not a physical constant, but is rather, a modeled estimate of the greenhouse effectiveness of the substance at a future benchmark year (i.e., 2100).

There are no Federal thresholds that define a given amount of GHG emissions from an action as "significant" in a NEPA context. For stationary emissions sources subject to major source construction permitting rules, EPA policy is to consider an emission increase of 75,000 tons per year or more of GHGs as sufficient to require an analysis of the best available control technology for a project.

Carbon Dioxide

CO_2 is a colorless gas that is formed especially in animal respiration and in the decay or combustion of organic matter, including fossil fuels (current concentration is 407.61 ppm, NASA 2018). CO_2 is essential to plant life, as it is absorbed from the air by plants to support photosynthesis. Over geologic time, it is estimated that atmospheric CO_2 concentrations have ranged from over 6,000 ppm around 500 million of years ago, to less than 200 ppm during the height of the last ice age, around 20,000 years ago (IPCC 2001). At less than 200 ppm of atmospheric CO_2, plant survival and reproduction is severely impaired. The current level in the atmosphere is approximately 400 ppm and is increasing in response to fossil fuel use and other processes, such as cement production.

Nitrous Oxide

N_2O, commonly known as laughing gas or nitrous, is a chemical compound that is a colorless and odorless gas at room temperature but has a slightly sweet taste. Its best-known use is as a mild sedative by dentists. N_2O is generated in minor amounts by combustion, but according to the Intergovernmental Panel on Climate Change (IPCC 2007), most of it is produced by natural sources. These sources include bacteria in wet environments and in soils rich in nitrates, especially soils amended by nitrate fertilizers. Atmospheric average concentrations have been increasing due to human activities during the industrial age. The current GWP estimate for N_2O, as assigned under the EPA mandatory GHG reporting rules of 40 CFR 98, is equal to 298.

Methane

CH_4 is the primary chemical constituent of natural gas. Emissions to the atmosphere result from natural organic matter decay; seeps from underground sources; agricultural activities, including animal flatulence; and during exploration and production of oil and gas resources. It is also released from combustion processes when combustion is not 100 percent complete. Atmospheric average concentrations have been increasing due to human activities during the industrial age. The current GWP estimate for CH_4, as assigned under the EPA mandatory GHG reporting rules of 40 CFR 98, is equal to 25.

Sulfur Hexafluoride

SF_6 is one of the most potent GHGs known on a pound-for-pound basis. Fortunately, it is produced and emitted in relatively small amounts compared to other GHGs. This chemical is not produced naturally and its estimated half-life in the atmosphere is in the thousands of years. Under normal environmental conditions it is a colorless, odorless, non-toxic, non-flammable, unreactive gas. It is also very dense, at about five times heavier than air, making it one of the heavier known gases. Due to its electrical insulating properties, one of its primary uses is in electrical components (e.g., large circuit breakers). SF_6 has a number of medical uses and is also used in the production of magnesium. The current GWP estimate for SF_6, as assigned under the EPA mandatory GHG reporting rules of 40 CFR 98, is equal to 22,800.

Hydrofluorocarbons

HFC compounds, composed of hydrogen, fluoride, and carbon, are used mainly in air conditioning and refrigeration applications. They are generally nontoxic, noncombustible, have long atmospheric lifetimes, and have relatively high GWP values.

Perfluorocarbons

PFC compounds are composed of fluorine and carbon, are used as refrigerants, in semi-conductor manufacturing, and in some medical applications. Like HFCs, they are generally colorless, odorless, nonflammable, unreactive gases. They usually have long atmospheric lifetimes and have relatively high GWP values.

Visibility Protection Regulations

Federal visibility protection regulations, provided in 40 CFR 51, Subpart P, govern air quality at Class I national parks and WAs. These regulations contain requirements for protecting visibility through the New Source Review permitting program (40 CFR 51.307), the Regional Haze regulations that target retrofit and mitigation requirements for existing air pollution sources (40 CFR 51.308), and special requirements for visibility protection in the Grand Canyon and 15 other Class I areas in the region (40 CFR 51.309).

Air Quality Related Values (AQRVs) are defined as a resource “for one or more Federal areas that may be adversely affected by a change in air quality. The resource may include visibility or a specific scenic, cultural, physical, biological, ecological, or recreational resource identified by a Federal land manager for a particular area” (US Forest Service [USFS] 2010). AQRVs were assessed for visibility trends utilizing the Interagency Monitoring of Protected Visual Environments data (IMPROVE). The National Atmospheric Deposition Program (NADP) was used to assess acid deposition data and the Clean Air Status and Trends Networks (CASTNet) was assessed to obtain dry deposition information.

Visibility trends for the Phoenix area illustrates deciview (dv) decreasing by 0.28 each year from 2002 to 2015 on the clearest days. Similarly, the haziest days decrease at a 0. 36 dv/year rate during that same time period. The clearest days range from 14.7 dv in 2002 to 10.8 dv in 2014. The haziest days range from 26.9 dv in 2002 and 21.21 dv in 2012.

The most appropriate site evaluated for acid deposition was the Joshua Tree National Park – Black Rock location. Trend plots of sulfate, nitrate and ammonia were evaluated. All three pollutants were examined from 2002 through 2016. A few of those years did not meet the data completeness criteria set forth by the NADP. However, the 3-yr average trend show a peak concentration in 2004 and sharp decline through 2007. Since 2007 both the sulfate and nitrate annual concentrations have fluctuated up and down from year to year. Ammonia increased from 0.25 kg/ha in 2007 to 0.89 kg/ha in 2009. However, it too has fallen off nearly 50% or more through 2016.

Dry deposition of nitrogen and sulfur were evaluated at the Joshua Tree National Park from 2002 through 2016 via CASTNet. Nitrogen decreased steadily throughout the timeframe from 3.091 to 1.49 kg/ha. Conversely, sulfur deposition has remained stagnant with the annual totals ranging from 0.248 to 0.405 kg/ha.

3.2.1.2 State, County, and Local

Relevant state, county, and local air quality laws and regulations applicable to the study area are summarized in the following sections.

State Regulations

Arizona

In Arizona, air quality statutes are codified in the Arizona Revised Statutes, Title 49, Chapter 3. Air quality regulations in Arizona are codified in the Arizona Administrative Code (AAC), Title 18, Chapter 2. The Arizona ambient air quality standards, which are listed in Title 18, Chapter 2, Article 2 of the AAC, are the same values as specified by the NAAQS as provided under 40 CFR 50. Two Arizona counties, Maricopa and La Paz, are crossed by the Proposed and Alternative segments. Maricopa County has its own air pollution control program, operating pursuant to agreement with the ADEQ. The ADEQ is responsible for regulating air quality in La Paz County.

For the protection of visibility, Arizona has several types of rules. Major new sources and major modifications must address visibility impacts on Class I areas through the state's implementation of the New Source Review permitting process (Title 18, Article 4). Requirements for nonpoint sources such as open burning, agriculture, mining, material handling, and storage piles are found in Title 18, Article 6. Smoke management and prescribed burning are regulated under Title 18, Article 15. Regional haze rules for implementing the Federal Class I area visibility requirements are found in Title 18, Article 16. There are no Class I areas in Arizona within the study area.

California

The California Clean Air Act became law in 1988. California air quality statutes are found under the California Health and Safety Code, Division 26 – Air Resources. Division 25.5 of the California Health and Safety Code contains the California Global Warming Solutions Act of 2006. Division 26 provides for the formation of air quality management districts to manage air quality within their areas. The Proposed and Alternative segments all fall within the jurisdiction of the MDAQMD, which covers the Mojave and Sonoran Desert portions of San Bernardino County and the Palo Verde Valley of eastern Riverside County, including the City of Blythe.

California Ambient Air Quality Standards (CAAQS) are found in the California Code of Regulations (CCR), Title 17, Division 3 – Public Health, Chapter 1, Subchapter 1.5 – Air Basins and Air Quality Standards. The standards include the same pollutants regulated under the NAAQS (Table 3.2-1) and some additional pollutants, including hydrogen sulfide, sulfates, and vinyl chloride as summarized in Table 3.2-2. The CCR contains requirements to control diesel particulate matter emissions from stationary sources as provided in Subchapter 7.5 – Airborne Toxic Control Measures (ATCM), and from mobile sources under CCR Title 13, Division 3 – Motor Vehicles.

Table 3.2-2 California Ambient Air Quality Standards

POLLUTANT	AVERAGING PERIOD	STANDARD	UNITS
Nitrogen dioxide (NO_2)	1 hour[a] Annual	180 30	ppb ppb
Carbon monoxide (CO)	1 hour 8 hours 8 hours (Lake Tahoe)	20 9 6	ppm ppm ppm
Sulfur dioxide (SO_2)	1 hour[b] 24 hours[b]	250 0.04	ppb ppm
Particulate matter up to 10 micrometers in size (PM_{10})	24 hours[c] Annual[c]	50 20	µg/m³ µg/m³
Particulate matter up to 2.5 micrometers in size ($PM_{2.5}$)	Annual[d]	12	µg/m³
Ozone (O_3)	1 hour 8 hours	0.090 0.070	ppm ppm
Lead (Pb)	30-day average[e]	1.5	µg/m³
Visibility Reducing Particles	8 hours[f]	See footnote f	--
Sulfates (SO_4)	24 hours	25	µg/m³
Hydrogen Sulfide (H_2S)	1 hour	0.03	ppm
Vinyl Chloride	24 hours[e]	0.01	ppm

Source: CARB 2016 (https://www.arb.ca.gov/research/aaqs/aaqs2.pdf)

California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM_{10}, $PM_{2.5}$, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

a. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb.

b. On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO2 national standards (24-hour) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

c. The existing 24-hour PM_{10} standards (primary and secondary) of 150 µg/m³ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

d. On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 µg/m³ to 12.0 µg/m³. The existing national 24- hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 µg/m³, as was the annual secondary standard of 15 µg/m³.

e. The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 µg/m³ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

f. In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

There are several regulations in California intended to reduce emissions related to combustion of diesel fuel in on-road vehicles, non-road vehicles, and portable or stationary non-road engines (see California rules for operators of on-road diesel vehicles at):

- https://www.arb.ca.gov/msprog/onrdiesel/onrdiesel.htm;
- https://www.arb.ca.gov/diesel/statportreg.htm;
- https://www.arb.ca.gov/msprog/onrdiesel/regulation.htm;
- https://www.arb.ca.gov/msprog/ordiesel/ordiesel.htm;
- https://www.arb.ca.gov/msprog/ordiesel/reglanguage.htm).

For on-road and non-road equipment involved in Project construction and maintenance activities for Project operation, equipment would be required to meet applicable state emission standards and fuel requirements. For additional data regarding diesel fuel emissions requirements, see Diesel in Section 3.2.1.1.

GHG emissions are subject to tracking and control in California under various policies, regulations, and laws, including Executive Order (EO) S-3-05, EO S-01-07, Assembly Bill (AB) 32, Senate Bill (SB) 97, AB 1493, SB 1078, and SB 107. In addition, a mandatory reporting rule has been implemented on January 1, 2018. This includes electricity generation units that report annual CO_2 mass emissions via 40 CFR Part 75.

Only one Class I area is in California within 50 km of the Proposed Action and Alternative Segments: Joshua Tree National Park, the easternmost portion of which is almost exactly 50 km northwest of the western terminus of the Project at the Colorado River Substation.

Local Regulations

In Arizona, the ADEQ and Maricopa County are responsible for air quality management, including issuance of air emissions permits (such as a General Permit for concrete batch plants), in the areas of the Proposed and Alternative segments in Arizona, with Maricopa County having authority within its county borders, and the ADEQ having authority in La Paz County.

In the California portion of the Proposed and Alternative segments, the MDAQMD is responsible for air quality management, including issuance of air emissions permits. The ADEQ, Maricopa County, and the MDAQMD have rules requiring the minimization of fugitive-dust emissions from construction activities. Additionally, the MDAQMD has published its own California Environmental Quality Act (CEQA) guidelines, which provide daily and annual emission thresholds (criteria pollutants, GHGs and hydrogen sulfide [H_2S]) for projects, above which emissions must be mitigated to either below the thresholds or to the maximum extent possible (MDAQMD 2016).

The MDAQMD has promulgated specific regulations related to fugitive dust (Rule 403, Fugitive Dust) that prohibit visible dust in the atmosphere beyond the property line of the emission source. MDAQMD Rule 401 prohibits any single source from emitting air contaminants resulting in greater than 20 percent opacity (No. 1 on Ringelmann Smoke Chart) for more than 3 minutes in any hour. In addition, the MDAQMD would need to issue an air quality permit under Regulation II of their rules for any portable concrete batch plants located in Riverside County (Blythe area).

Any such batch plant would need to meet the particulate matter emissions limitations of MDAQMD Rules 404 and 405.

A portion of the MDAQMD was previously designated a nonattainment area for the original (1997) 8-hour ozone NAAQS, and the whole MDAQMD was designated by the state of California as a nonattainment area for the ozone CAAQS. In April 2004, the MDAQMD developed and implemented the "MDAQMD 2004 Ozone Attainment Plan" (MDAQMD 2004) in response to these designations. Currently the Project Area portion of the MDAQMD is designated as in attainment for the 20015 ozone NAAQS of 70ppb, but it is still in nonattainment status for the CAAQS for ozone. The emission control measures in the 2004 plan were all adopted into MDAQMD rules.

In February 2017, the MDAQMD proposed adoption of a "MDAQMD Federal 75 ppb Ozone Attainment Plan" that (1) demonstrates that the MDAQMD will meet the primary required Federal ozone planning milestone, attainment of the 75 ppb 8-hour ozone NAAQS, by July 2027 [note the 75 ppb NAAQS nonattainment status does not apply to the Project Area]; (2) presents the progress the MDAQMD will make towards meeting all required ozone planning milestones; and (3) discusses the 2015 70 ppb 8-hour ozone NAAQS, preparatory to an expected nonattainment designation for the new NAAQS.

3.2.2 Study Area

The air quality study area is a 31-mile (50 kilometer [km]) radius around the Proposed Action and Alternative Segments. A 31-mile radius was chosen to be consistent with minimum air quality analyses required by the EPA's Prevention of Significant Deterioration regulations.

For purposes of GHG assessment, the existing conditions in each state are described, and the overall global climate with respect to emission of GHGs is discussed in Section 3.2.4.1.

3.2.2.1 Inventory Methods

The selection of the air quality data collection methods was based on the expected objectives for the air quality analysis, which are to (1) summarize existing air quality conditions, including existing emissions inventories and ambient air monitoring data, and (2) assess Project-related emissions for both the construction and operation phases. Project-related emissions, applicable information and an analysis of construction and operations emissions are included in the associated baseline document (HDR 2017a).

An annual emission increase from construction or operation above the general conformity *de minimis* emissions thresholds would require mitigation of emissions and coordination with Federal and state agencies to document the emissions and to obtain agreement that the Proposed Action would not impede approved state plans to bring the NAAQS nonattainment areas into attainment and to maintain acceptable air quality in maintenance areas.

Transportation-related air quality analysis, such as assessment of CO hot spots, is not addressed, given that traffic levels associated with both Project construction and operation would be too small to have a measurable effect at any one intersection in the study area.

The data collection methods consisted primarily of the use of online databases maintained by the EPA and state agencies, and the use of EPA-approved emission factor models and emission factors. Specific sources of information and the information gathered are provided in the following sections. Existing information on ambient air quality, regional climate, air pollutant sources, and GHG emission sources was obtained from various published sources, including documents and online data available from the EPA, the ADEQ, the CARB, county air quality departments, and the Western Regional Climate Center (WRCC).

3.2.3 Existing Conditions

3.2.3.1 Climate

The Southwest Arizona climate division (National Oceanic and Atmospheric Administration [NOAA] 2016a), which is also representative of the adjoining desert areas of California, averages only about 5 inches of precipitation per year. However, in the more than 100 years of historical record, the annual precipitation in this climate division has ranged from less than 1 inch in 1956 to more than 11 inches in 1941 (WRCC 2016a). Most of the annual precipitation tends to fall in the winter. In the summer monsoon season that runs from July into September, August on average is the wettest month of the year at slightly less than 1 inch of precipitation. June is the driest month of the year, and, in most years, no measurable precipitation falls in June.

Monthly average temperatures over the past 30 years range from approximately 54 degrees Fahrenheit (°F) in January to 92°F in July, based on WRCC data. In July, the daily maximum temperature has averaged 106°F, and the average daily minimum temperature has averaged 78°F over the past 30 years. In January, the daily maximum temperature averaged 67°F, and the daily minimum temperature averaged 42°F over the past 30 years.

Wind speeds in the region tend to be light compared with most of the US. For the nearest station with average wind data in the WRCC's database, in Yuma, the average daily wind speed peaks in July at approximately 9 miles per hour (mph), with the minimum daily wind speed at 5.6 mph in October (WRCC 2016b).

The topography of the study area does not include significant air basins that serve to trap emissions and restrict dispersion of air pollutants. The desert climate of the area allows for deep vertical mixing of air pollutants during daytime heating, and more limited dispersion at night as the desert cools, which tends to create temperature inversions at ground-level that minimize turbulent mixing.

3.2.3.2 Air Quality

Current air quality conditions in the study area along the Proposed and Alternative segments are represented by the monitoring data summarized in Table 3.2-3. The data were obtained from the EPA's AirData website (EPA 2016a). The monitor locations selected for this tabular summary are those nearest the study area for each pollutant shown. The data presented are from the nearest monitor locations to the Project study area for each pollutant.

Given the rural, unpopulated nature of the Proposed Action and/or Action Alternative routes, concentrations of most pollutants are well below the NAAQS. The only exception is O_3, for which concentrations at the Arizona monitor are essentially right at or slightly above the recently strengthened (October 2015) O_3 NAAQS of 70 ppb. States and the EPA are currently in a 2-year process to establish attainment/nonattainment status with respect to the new O_3 NAAQS. Figure 3.2-1 (Appendix 1) provides a geographic layout of the two O_3 nonattainment areas in or near the Project Area. A portion of the Phoenix nonattainment area falls within the Project Area. In addition, the nonattainment area of Imperial County, California was added, but is outside the Project Area. With respect to the new (2015) 8-hour ozone NAAQS, monitored 3-year average ozone values in the California portion of the Project Area (Blythe) indicate compliance with the NAAQS (Table 3.2-3). Project emissions associated with Riverside County are discussed in detail in Section 4.2.4.1 and to ensure conservatism, Imperial County emissions are assumed to be equivalent to those in Riverside County. Both VOC and NO2 are considered ozone precursors. The Project and proposed alternatives are compared to Imperial County Air Pollution Control District significance thresholds.

A small portion of the eastern end of the Project route is in an area designated as nonattainment with the preexisting O_3 NAAQS of 75 ppb. As of April 30, 2018, the O_3 nonattainment designation was for the 70 ppb NAAQS maintained the same geographic region surrounding the Phoenix area.

The state of California has designated the Riverside County portion of the Project Area as being in nonattainment with CAAQS for O_3 and PM_{10}, and either in attainment or unclassified for all other pollutants regulated under the CAAQS.

Table 3.2-3 Summary of Recent Air Quality Monitoring Data for the Study Area

POLLUTANT	MONITOR LOCATION	AVERAGING PERIOD	MONITORED NAAQS BASIS CONCENTRATION[1]					NAAQS
			UNIT	2013	2014	2015	3-YR. AVG.	
Carbon monoxide	Buckeye, AZ	1-hour	ppm	0.8	0.9	0.8	0.8	35
		8-hour	ppm	0.4	0.6	0.5	0.5	9
Nitrogen dioxide	Wenden, AZ	1-hour	ppb	NA	6	5	5.5	100
		Annual	ppb	NA	0.75	1.36	1.1	53
Ozone	Wenden, AZ	8-hour	ppb	71	71	70	70.7	70
	Blythe, CA*	8-hour	ppb	57	78	63	66.0	
Particulate matter less than 10 micrometers	Wenden, AZ	24-hour	µg/m^3	NA	83	62	72.5	150
Particulate matter less than 2.5 micrometers	Wenden, AZ	24-hour	µg/m^3	NA	8	7	7.5	35
	Wenden, AZ	Annual	µg/m^3	NA	2	1	1.6	12
Sulfur dioxide	Wenden, AZ	1-hour	ppb	NA	2	3	2.5	75

[1] ppb = parts per billion, ppm = parts per million, µg/m^3 = micrograms per cubic meter, NA = not applicable
* Ozone is the only criteria pollutant monitored at the Blythe station.

3.2.3.3 Existing Global, National, and Statewide Greenhouse Gas Emissions

The US' total GHG emissions (expressed as CO_2e or carbon dioxide equivalent, a standard unit for measuring carbon footprints) were estimated at 6,511.3 million metric tons in 2016 (EPA 2018). As of 2014, estimated US emissions represented approximately 15 percent of the global total GHG emissions (Boden et al. 2017). Assuming that the US' portion of global CO_2e emissions was approximately the same for 2016 as it was in 2014 (15 percent), the global total emissions in 2016 would have been approximately 43.4 billion metric tons per year.

For the most recent year of data available in the EPA's statistics (calendar year 2000), the EPA estimated that Arizona GHG (CO_2e) emissions were approximately 92.3 million metric tons per year (EPA 2016b).

California GHG emissions were estimated by the California Air Resources Board at 440.4 million metric tons of CO_2e in 2015 (CARB 2017a). These emissions have followed a declining trend since 2007. In 2015, emissions from routine emitting activities statewide were 1.5 million metric tons of metric tons of CO_2e lower than 2014 levels, representing an overall decrease of 10 percent since peak levels in 2004 (CARB 2017a).

3.3 GEOLOGY, MINERALS, AND SOIL RESOURCES

3.3.1 Applicable Laws, Regulations, Policies, and Plans

The following sections summarize Federal, state, and local laws, regulations, and standards that govern geology, mineral resources, and soils across the study area. Permitted activities that may affect or be affected by geological resources and geological hazards are governed primarily by local jurisdictions and the BLM. The conservation and seismic safety sections of city and county general plans often contain policies for the protection of geological features and avoidance of hazards, but generally do not specifically address the construction of a transmission line. Local grading ordinances may establish detailed procedures for excavation, blasting, or construction. The following sections summarize the regulations that govern permitted activities that may affect or be affected by geology and minerals in the study area.

3.3.1.1 Federal

IB2008-107 conveys the BLM's Energy and Mineral Policy which reflects the provisions of six important acts of Congress relating to conventional, alternative, and renewable energy, and mineral resources, as follows:

The Domestic Minerals Program Extension Act of 1953 states that each department and agency of the Federal government charged with responsibilities concerning the discovery, development, production, and acquisition of strategic or critical minerals and metals shall undertake to decrease further, and to eliminate wherever possible, the dependency of the US on foreign sources of supply of such material.

The Mining and Minerals Policy Act of 1970 declares that it is the continuing policy of the Federal government to foster and encourage private enterprise in the development of a stable domestic minerals industry and the orderly and economic development of domestic mineral resources. This act includes all minerals, including sand and gravel, geothermal, coal, and oil and gas.

The Federal Land Policy and Management Act (FLPMA) of 1976 reiterates that the 1970 Mining and Minerals Policy Act shall be implemented and directs that public lands be managed in a manner that recognizes the Nation's need for domestic sources of minerals and other resources. It also mandates that "scarcity of values" be considered in land use planning.

The National Materials and Minerals Policy, Research and Development Act of 1980 requires the Secretary of the Interior to improve the quality of minerals data in Federal land use decision-making.

The Energy Policy Act of 2005 encourages energy efficiency and conservation, promotes alternative and renewable energy sources, reduces dependence on foreign sources of energy, increases domestic production, modernizes the electrical grid, and encourages the expansion of nuclear energy.

The Energy Independence and Security Act of 2007 to move the United States toward greater energy independence, to increase the production of clean renewable fuels, and support modernization of the nation's electricity transmission and distribution system.

The BLM's minerals management regulations are contained in CFR Title 43 Parts 3000-3800. Relative to leasable minerals, Part 3100 covers oil and gas, Part 3200 addresses geothermal resources, Part 3400 addresses coal, and Part 3500 covers solid leasable minerals other than coal and oil shale. Salable minerals such as sand and gravel are addressed in Part 3600, which includes provisions for both sale and free use of mineral materials. Locatable minerals, including regulations related to mining claims, are addressed in Part 3800.

Other relevant laws include the following:

- Federal Coal Leasing Amendments Act (30 USC 201)
- Federal Onshore Oil and Gas Leasing Reform Act [30 USC 226(g)]
- The Act of May 10, 1872 (R.S. § 2319 et seq.; 30 USC 22 et seq.), generally referred to as the "Mining Law of 1872"
- Geothermal Steam Act (30 USC 1001 et seq.)
- Mineral Leasing Act (30 USC 181 et seq.)
- Mineral Leasing Act for Acquired Lands (30 USC 351 et seq.)
- Stock Raising Homestead Act (43 USC 291–299)
- Surface Mining Control and Reclamation Act (30 USC 1201 et seq.)
- Surface Resources Act of 1955 (30 USC 611–615)
- Classification and Multiple Use Act of 1964 (43 USC 1411-18)
- Act of July 31, 1947 (61 Stat. 681), the Material Sale Act

3.3.1.2 State

Arizona

The Arizona Geological Survey (AZGS) is the primary source of geologic information in the state. The AZGS maps bedrock and surficial geology and provides the information to local, state, and Federal governmental agencies that are responsible for managing Arizona's land, water, mineral, and energy resources. The AZGS also informs industry and the public about matters pertaining to geologic hazards, and the development and use of mineral resources.

Arizona state law requires counties to prepare a comprehensive plan to provide direction on growth and development, conservation of natural resources, and promotion of the health, safety, convenience, and general welfare of the public (ARS 11-806).

California

The state of California Surface Mining and Reclamation Act of 1975 (SMARA, Public Resources Code, Sections 2710-2796) provides a comprehensive surface mining and reclamation policy with the regulation of surface mining operations to assure that adverse environmental impacts are minimized, and mined lands are reclaimed to a usable condition.

The Alquist-Priolo Earthquake Fault Zoning Act of 1972 (formerly the Special Studies Zoning Act) regulates development and construction of buildings intended for human occupancy to avoid the hazard of surface fault rupture. While this Act does not specifically regulate overhead transmission lines, it does help define areas where fault rupture may occur. This Act groups faults into categories of active, potentially active, and inactive. Historic and Holocene-age faults are considered active, Late Quaternary- and Quaternary-age faults are considered potentially active, and pre-Quaternary-age faults are considered inactive. These classifications are qualified by the conditions that a fault must be shown to be "sufficiently active" and "well defined" by detailed site-specific geologic explorations to determine whether building setbacks should be established.

The Seismic Hazards Mapping Act of 1990 (Public Resources Code, Chapter 7.8, Division 2) directs the California Department of Conservation, Division of Mines and Geology (now called the California Geological Survey) to delineate seismic hazard zones. The purpose of this Act is to reduce the threat to public health and safety and to minimize the loss of life and property by identifying and mitigating seismic hazards. Cities, counties, and state agencies are directed to use seismic hazard zone maps developed by the California Geological Survey in their land-use planning and permitting processes. The Seismic Hazards Mapping Act requires that site-specific geotechnical investigations be performed prior to permitting most urban development projects within seismic hazard zones.

The 2016 California Building Standards Code (California Code of Regulations, Title 24) went into effect on January 1, 2017, and is based on the 1997 Uniform Building Code, with the addition of more extensive structural seismic provisions. Chapter 16 of the California Building Code contains definitions of seismic sources and the procedure used to calculate seismic forces on structures. Because the Project route lies within International Business Code (IBC) Seismic Zone 3, provisions for design should follow the requirements of Chapter 16.

California state law requires each county and city to adopt a comprehensive, long-term general plan for the physical growth and development of the county or city.

Local

The safety elements of the county and state general plans within the study area contain policies for the avoidance of geologic hazards and/or the protection of unique geologic features. A survey of general plans within the study area indicated that most municipalities require the submittal of construction and operational safety plans for proposed construction in areas of identified geologic and seismic hazards for review and approval prior to issuance of permits. County and local grading ordinances establish detailed procedures for excavation and grading required for underground construction.

The La Paz County Comprehensive Plan (2005, as amended) includes the goal of protecting geological formations within Federally designated wildlife refuges and WAs.

The Maricopa County Comprehensive Plan, Vision 2030 (2016), addresses several geologic hazards including soil/slope failure and land subsidence caused by groundwater withdrawal. The plan discourages development on slopes greater than 15 percent and favors retaining trees and vegetation for slope and soil stabilization. Strategies for handling land subsidence include deterring development in areas of subsidence and associated earth fissures and implementing the County's Hazard Mitigation Plan (Maricopa County 2015).

The Tonopah/Arlington Area Plan (Maricopa County 2000) provides a guide for decisions by policymakers concerning growth and development in the Tonopah/Arlington planning area within Maricopa County and can also serve as a reference for private sector decision making. The plan describes the geology and soils in the Tonopah/Arlington planning area. Policy E.1.2 encourages land uses and development designs that are compatible with environmentally sensitive areas such as unstable geologic and soil conditions.

The Town of Quartzsite General Plan (2014) is a guide for policy decisions concerning the relationships between land use, transportation, quality of life, the environment, and the economy. The plan does not specifically address geologic or soils issues.

The Riverside County, California, General Plan (2003) addresses seismic hazards and nonseismic geologic hazards including landslides, land subsidence, wind erosion, and flooding. The plan provides risk maps of geologic hazards. The Riverside County Multi-Jurisdictional Local Hazard Mitigation Plan, March 2005, also contains information relative to geologic hazards.

The City of Blythe General Plan 2025 (2007a) contains specific policies and standards including mitigation. The relevant geology and soils topics covered by the plan are: mineral resources, seismic hazards, and other geologic hazards including flooding, slope failure, erosion, and land subsidence.

3.3.2 Study Area

The study area for geology and mineral resources is a 4,000-foot corridor encompassing the Proposed Action and Alternative Segments. The study area for soils is a 2-mile wide corridor encompassing the Proposed Action and Alternative Segments. The study area for geologic hazards is 50 miles from the Project Area for historic seismicity, 20 miles from the Project Area for Quaternary faulting, and a 2-mile corridor encompassing the Proposed Action and Alternative Segments for other geologic hazards. Sources of data and inventory methods are provided in the

Geology, Mineral Resources, Soils, and Paleontology Baseline Technical Report (HDR 2017b). The geology, mineral resources, and soils study area also encompasses 200-feet on either side of the alternative SCS 12kV distribution line.

3.3.3 Existing Conditions

3.3.3.1 Regional Geology

The Project Area extends from the Mojave Desert Province of southern California and into the Basin and Range Province (BLM 2006, 2008b, 2008c), a geographic area that includes most of the western US and extends south into Mexico. The Mojave Desert Province is a broad interior region of isolated mountain ranges separated by expanses of desert plains. It has an interior enclosed drainage and many playas. The Basin and Range Province, which formed about 20 million years ago (Ma), is characterized by northwest-trending, block-faulted mountain ranges separated by deep, alluvium-filled basins. The basins generally consist of sedimentary deposits and the mountain ranges consist of granitoid and metamorphic rock (BLM 2008c). These mountains of late Precambrian and Paleozoic rock continue to erode and fill the intervening valleys with fresh sediment (BLM 2008c). Figure 3.3-1 (Appendix 1) depicts major landforms in the Project Area, such as mountain ranges. The Geology, Mineral Resources, Soils, and Paleontology Baseline Technical Report (HDR 2017b) provides detailed topographic maps.

3.3.3.2 Local Geology

The study area contains middle to late Tertiary sediments dating to 18 Ma, and Quaternary sediments. Approximately 38 percent of the study area contains igneous and metamorphic rocks, which are unlikely to contain fossils (Section 3.4). The remainder of the study area contains sedimentary units, which, depending on their age, may have the potential to contain fossils. Mountain ranges in the Project Area generally are dominated by Tertiary volcanics with some Precambrian (Proterozoic) to Mesozoic igneous or metamorphic core complexes. The deep intermontane basins generally contain Paleozoic and Mesozoic sedimentary rocks overlain by Tertiary sedimentary and volcanic sequences (BLM 2008c).

Portions of the Big Horn, Eagletail, Plomosa, and Dome Rock Mountains are within the study area. The Proposed Action route traverses the south edge of the Big Horn Mountains, north-northwest of the Delaney Substation. Elevations in the Big Horn Mountains range from about 3,480 feet asl at Big Horn Peak, to approximately 1,400 feet asl along the southwest front of the range. The geology consists of Proterozoic metamorphic rocks (gneiss, schist, and phyllite) with Mesozoic igneous intrusions, overlain by a Miocene basalt-rhyolite volcanic sequence that includes minor sedimentary rocks (USGS 1987).

West of the Delaney Substation and south of the Project Area, the Eagletail Mountains extend about 15 miles from northwest to southeast. Their topography is characterized as severely eroded with basaltic cliffs and jagged peaks (BLM 1995). The Plomosa Mountains are in La Paz County approximately 10 miles north of Quartzsite, Arizona. The Dome Rock Mountains are found in La Paz County, Arizona, trending north-to-south for approximately 30 miles. Both the cities of Blythe, California, and Quartzsite, Arizona, are adjacent to the range. The Dome Rock and Plomosa ranges primarily consist of sedimentary rock deposited during the Paleozoic Era, and volcanic and sedimentary rocks from the Triassic and Jurassic Periods of the Mesozoic Era.

The California portion of the study area is within the Palo Verde Valley. The Palo Verde Valley is underlain by (in order beginning at the surface):

- Pliocene- to Holocene-age alluvial deposits, which extend about 160 to 600 feet bgs
- Upper Miocene- to Pliocene-age Bouse Formation, at depths ranging from 500 to 600 feet bgs
- Miocene-age fanglomerate, at depths that can be greater than 800 feet bgs (CDWR 2016a)

The McCoy Mountains on the northwestern border of the Palo Verde Valley consist of sandstone, mudstone, and conglomerate of the McCoy Mountains Formation with intrusive quartz porphyry at the southern end of the range. The Mule Mountains on the western edge of the valley are part of an extensive volcanic field and consist of andesitic, rhyolitic, granitic, and basalt rocks with flows, dikes, and pyroclastic deposits (Norris and Webb 1990).

The surface geology of the study area crosses both alluvial deposits and sedimentary, metamorphic, and igneous bedrock formations (Appendix 1, Figures 3.3-2a-c). Within the 4,000-foot corridor for all combined alternatives, approximately 85 percent of the area consists of unconsolidated surficial deposits, and approximately 15 percent of the area consists of bedrock. The surficial geologic units depicted on the geology maps are summarized in Table 3.3-1, including the unit description, geologic age, and primary and secondary constituents.

Table 3.3-1 Geology of the Study Area

FIGURE 3.3-2 (APPENDIX 1) MAP ID	DESCRIPTION	GEOLOGIC AGE	PRIMARY COMPONENT	SECONDARY COMPONENT
Qs	Extensive marine and nonmarine sand deposits, generally near the coast or desert playas	Quaternary	Dune sand	Lake or marine deposit (nonglacial)
Qr	Holocene river alluvium (0–10 ka)	Holocene	Sand	Gravel
Qy	Holocene surficial deposits (0–10 ka)	Holocene	Sand	Gravel
Q	Quaternary surficial deposits, undivided (0–2 Ma)	Pliocene to Holocene	Alluvium	Terrace deposit
Qo	Early Pleistocene to Latest Pliocene surficial deposits (0.75–3 Ma)	Late Pliocene to Early Pleistocene	Gravel	Sand
Qm	Late and Middle Pleistocene surficial deposits (10–750 ka)	Middle to Late Pleistocene	Gravel	Sand
Qoa	Marine and nonmarine (continental) sedimentary rocks	Pleistocene	Alluvium	Lake, playa, and terrace deposits
Tsy	Pliocene to Middle Miocene deposits (2–16 Ma)	Middle Miocene to Pliocene	Conglomerate	Sandstone

FIGURE 3.3-2 (APPENDIX 1) MAP ID	DESCRIPTION	GEOLOGIC AGE	PRIMARY COMPONENT	SECONDARY COMPONENT
Tsm	Middle Miocene to Oligocene sedimentary rocks (11–32 Ma)	Oligocene to Middle Miocene	Conglomerate	Sandstone
Ti	Middle Miocene to Oligocene shallow intrusions (14–35 Ma)	Oligocene to Middle Miocene	Dacite	Rhyolite
Tv	Middle Miocene to Oligocene volcanic rocks (11–38 Ma)	Oligocene to Middle Miocene	Dacite	Rhyolite
KJs	Cretaceous to Upper Jurassic sedimentary rocks with minor volcanic rocks (80–160 Ma)	Late Jurassic to Cretaceous	Conglomerate	Sandstone
Jg	Jurassic granitic rocks (150–180 Ma)	Jurassic	Granodiorite	Granite
Jv	Jurassic volcanic rocks (160–200 Ma)	Jurassic	Rhyolite	Felsic metavolcanic rock
J?	Jurassic and Triassic sedimentary and volcanic rocks (160–240 Ma)	Triassic and Jurassic	Rhyolite	Sandstone
Pz	Paleozoic sedimentary rocks (248–544 Ma)	Paleozoic	Limestone	Sandstone
Xg	Early Proterozoic granitic rocks (1600–1800 Ma)	Early Proterozoic	Granodiorite	Granite
Xms	Early Proterozoic metasedimentary rocks (1600–1800 Ma)	Early Proterozoic	Phyllite	Schist
Yg	Middle Proterozoic granitic rocks (1400–1450 Ma)	Middle Proterozoic	Granite	Granodiorite

Notes: ka = thousand years ago, Ma = million years ago

Section 3.3.3.6 provides a detailed discussion of geologic conditions along the Proposed Action and Alternative Segments with the length in miles of each geologic unit crossed, as shown on the geology maps (Appendix 1, Figures 3.3-2a-c). No unique geologic features are within the Project Area.

3.3.3.3 Geologic Hazards (Subsidence and Earth Fissures)

Geologic hazards are naturally occurring events in the earth's crust that present a threat to property and life. The geologic hazards in the region generally range from shallow surface hazards that include collapsible soils and shrink/swell (expansive) soils, to deeper and sometimes more substantial hazards including land subsidence, earth fissures, sinkholes, landslides, volcanism, flooding, and seismic hazards (earthquakes) including liquefaction (AZGS 2016). Soils-related hazards (expansive, corrosive, or collapsible soils) are addressed in Section 3.3.3.5.

Potential geologic hazards in the study area include seismic-related hazards (earthquakes, faults, and soil liquefaction) and landslides, land subsidence, and flooding.

Earthquakes

Earthquakes are a potential hazard for the study area, particularly in the California and western Arizona segments, given their proximity to the San Andreas Fault zone (AZGS 2012). Ground shaking and damage from earthquakes originating in California have been documented in Yuma, Arizona, near the California-Arizona-Mexico border (AZGS 2012). In contrast, no damage-causing historic seismic events have been recorded for Maricopa County (Maricopa County 2015). Figure 3.3-3 (Appendix 1) is a map of earthquakes with magnitude greater than 3.0 that have occurred within 50 miles of the Project. Most recorded earthquakes have occurred southwest of the Colorado River Substation near the Salton Sea.

Seismic risk can be quantified by the motions experienced by the ground surface or structures during a given earthquake as expressed in terms of g (the acceleration due to gravity), or peak ground acceleration. The US Geological Society (USGS) has developed maps for the US that describe the likelihood for shaking of varying degrees to occur in a given area (USGS 2014a). The seismic hazard potential in the study area, as determined from the USGS seismic hazard maps, is depicted in Figure 3.3-4 (Appendix 1). The hazard is shown as the peak ground acceleration for an earthquake with a 2 percent probability of exceedance in 50 years. Values range from a relatively low risk of 6 to 8 percent g at the Delaney Substation in Maricopa County, Arizona, to a moderate risk of 16 to 18 percent g at the Colorado River Substation in Riverside County, California.

Faults

No Quaternary-age active faults (active faults that have been recognized at the surface and that have evidence of movement in the past 1.6 million years) are mapped within the 20-mile study area for faults (HDR 2017b). The nearest mapped fault is the Aztec Mine Wash fault, which is approximately 30 miles west of the Colorado River Substation and has an age of less than 1.6 million years. The nearest recently active faults (within the last 150 years) are the Imperial Fault and the Brawley Seismic Zone (Brawley Fault Zone) located about 50 to 60 miles to the southwest near Brawley and the Salton Sea (USGS 2015).

The Riverside County General Plan indicates the presence of a northwest-to-southeast trending Quaternary fault that passes through the northeastern corner of Blythe. The fault is several miles north of the Project Area. This fault is not identified in the USGS database. The closest Alquist-Priolo Earthquake Fault Zone is about 70 miles west of the Project Area.

Liquefaction

Soils most prone to liquefaction are saturated, poorly graded (that is, have a uniform grain size), noncohesive, and in areas where the groundwater table is within approximately 50 feet of the surface. Shaking from an earthquake causes these soils to lose strength and behave as a liquid. Liquefaction-related effects include loss of bearing strength, lateral spreading, and slumping.

Liquefaction hazard has been mapped for the study area in California but not in Arizona. As shown in Figure 3.3-5 (Appendix 1), most of the study area west of the Colorado River has a very high to moderate liquefaction risk because of the presence of shallow groundwater, the type of soils present, and the potential for ground shaking from an earthquake.

Although liquefaction hazard maps are not available for the Arizona portion of the study area, based on changes in topography east of the Palo Verde Valley, greater depths to groundwater, and lower seismic risk, the liquefaction hazard is likely less overall in the Arizona portion of the Project Area. Site-specific geotechnical tests are required to determine the specific liquefaction potential at a given location.

Landslides

A landslide is the downslope movement of soil and/or rock under the effects of gravity. Landslides can be slow or occur very rapidly. Landslides can be triggered by heavy precipitation, undercutting from natural processes such as streams, human disturbance such as construction activities, or earthquakes. In general, the steeper the slope, the more susceptible it is to landslides; however, the geology is also an important factor. For example, igneous rocks such as granite are more stable than shales or unconsolidated materials.

The USGS landslide risk database indicates that the relative risk for landslides in the study area is low, as indicated by an incidence of less than 1.5 percent (USGS 1982; HDR 2017b). The USGS determined relative risk by evaluating geologic units as being of high, medium, or low susceptibility to landslides and determining whether they have high, medium, or low landslide incidence (number of landslides). The determination did not take into consideration earthquake risk. However, the portion of the study area in Riverside County, which has the highest risk for earthquakes (see Faults), has a relatively low risk of landslides (Riverside County 2015a).

Although the overall landslide risk in the study area is low, locally there may be potential for slope movement in areas of steep topography depending on site-specific conditions. Table 3.3-2 lists parts of the Proposed Action and Alternative Segments that cross or are adjacent to relatively steep slopes based on review of the topographic maps (HDR 2017b). Most of these are associated with the Copper Bottom Zone and the slopes bounding the Palo Verde Valley in Riverside County, California.

Table 3.3-2 Steep Slopes

SEGMENT	COUNTY	PROJECT GEOGRAPHIC AREA
Proposed Action Route Segments		
p-01	La Paz, Maricopa	East Plains and Kofa Zone
p-05	La Paz	East Plains and Kofa Zone
p-06	La Paz	East Plains and Kofa Zone
p-09	La Paz	Copper Bottom Zone
p-10	La Paz	Copper Bottom Zone
p-11	La Paz	Copper Bottom Zone
p-12	La Paz	Copper Bottom Zone
p-13	La Paz	Copper Bottom Zone
p-14	La Paz	Copper Bottom Zone
p-15e	La Paz	Colorado River and California Zone
p-16	Riverside	Colorado River to California Zone
Alternative Segments		
x-05	La Paz	Quartzsite Zone
x-08	La Paz	Copper Bottom Zone
x-15	Riverside	Colorado River to California Zone
x-16	Riverside	Colorado River to California Zone
i-03	La Paz	East Plains and Kofa Zone
i-04	La Paz	East Plains and Kofa Zone
i-06	La Paz	Copper Bottom Zone
i-07	La Paz	Copper Bottom Zone
i-08s	La Paz	Colorado River and California Zone
in-01	La Paz	East Plains and Kofa Zone
qn-02	La Paz	Quartzsite Zone
qs-02	La Paz	Quartzsite Zone
cb-01	La Paz	Copper Bottom Zone
cb-02	La Paz	Copper Bottom Zone
cb-04	La Paz	Copper Bottom Zone
cb-05	La Paz	Copper Bottom Zone
cb-06	La Paz	Copper Bottom Zone
cb-10	La Paz	Colorado River to California Zone
ca-02	Riverside	Colorado River to California Zone
ca-06	Riverside	Colorado River to California Zone
ca-07	Riverside	Colorado River to California Zone

Land Subsidence

Subsidence is a general term that refers to the lowering of the ground surface elevation, which can occur gradually or rapidly, such as in a sudden collapse of an underground void. Some of the most common causes of subsidence include the large-scale withdrawal of groundwater, the dissolution of soluble rocks (resulting in karst), and mining activity.

Land subsidence from groundwater withdrawal is a greater risk in areas of higher population density. Land subsidence and associated earth fissures (linear cracks ranging from less than a yard to several miles long) from groundwater withdrawal are a documented geologic hazard in Maricopa County (Maricopa County 2015). However, based on information provided in the Maricopa County Hazard Mitigation Plan (Maricopa County 2015), land subsidence hazards are mainly associated with the greater Phoenix metropolitan area and have not been identified in the Tonopah area where the Project would be located. Likewise, although the City of Blythe has determined that the Palo Verde Valley has a moderate potential for land subsidence attributable to groundwater withdrawal, no evidence of major land subsidence has been reported (City of Blythe 2007a). Subsidence associated with groundwater withdrawal is not identified as a hazard in either the La Paz County Comprehensive Plan (La Paz County 2005) or Town of Quartzsite General Plan (Town of Quartzsite 2014).

Karst typically develops in carbonate rocks (limestone or dolomite) or evaporites. In semiarid and arid regions, these rocks do not typically exhibit large karst features, and sinkholes are rare. Rather, smaller-scale features are more common (USGS 2014b). The USGS karst database (USGS 2014b) indicates that no karst is present within 1 mile of the study area. Based on Table 3.3-1, the only geologic unit in the study area that is potentially susceptible to karst is “Pz,” consisting of Paleozoic limestone and sandstone. This rock unit is mapped at one location in the study area—where Segment i-04 crosses the Plomosa Mountains (Appendix 1, Figure 3.3-2b).

As described in Section 3.3.4, underground mines are present in the study area. On the topographic maps, mine shafts are indicated within 2,000 feet of Segments i-03, x-05, and qs-02. It is not known whether these mines are currently active or whether they have been associated with any collapses. Additionally, there is potential for undocumented underground mines in areas of historic mining activity. A field review would be necessary to identify specific locations of subsidence that have resulted from previous mine collapses.

3.3.3.4 Mineral Resources

The most important metallic minerals produced in Arizona include copper, gold, silver, molybdenum, and lead. Non-metallic (industrial) minerals produced include sand and gravel, crushed stone, clay, cement, gypsum, lime, perlite, pumice, and salt. Arizona is well known for its turquoise, peridot, petrified wood, azurite, and malachite. Arizona also produces energy resources such as coal and small quantities of petroleum and natural gas (AZGS 2016). Based on value, the top five nonfuel minerals produced in California are construction sand and gravel, Portland cement, boron minerals, crushed stone, and gold (CGS 2014). As of 2015, California had 56,653 active oil and gas wells (California Division of Oil, Gas, and Geothermal Resources 2015).

Information regarding mineral resources in the study area from the USGS database is provided in Table 3.3-3 and shown on Figure 3.3-6 (Appendix 1), which includes site names, locations, mineral commodities, operation types, development status, and references. Seven of the 21 resources occur along the Proposed segments and the others occur along the Alternative Segments. None of the resources appear to be active as the resources are listed as “past producer” (10), “occurrence” (8), “prospect” (2), and “unknown” (1). Mineral resources listed in Table 3.3-3 include gold, silver, copper, marble, limestone, tungsten, and aggregates.

Table 3.3-3 USGS Mineral Resources Data System Mining and Mineral Summary Table

MAP #	SITE NAME	SEG-MENT	STATE	COUNTY	COM. 1	COM. 2	COM. 3	OPERA-TION TYPE	STATUS	ORE	GANGUE
1	American Flag Mine	p-18	CA	Riverside	Gold			Unknown	Past Producer		Chalcopyrite Malachite Pyrite
2	La Paz District	p-11	AZ	Yuma	Gold	Silver		Unknown	Past Producer		
3	Unnamed Occurrence	i-06	AZ	La Paz	Kyanite			Unknown	Occurrence	Kyanite	
4	Oro Fino Gold Placers	qn-02	AZ	La Paz	Gold	Silver	Tungsten and Lead	Placer	Past Producer		
5	Shadow Mtn. Claims	qs-02	AZ	La Paz	Gold			Under-ground	Past Producer		
6	Julian Mine Group	qs-02	AZ	La Paz	Gold	Silver	Lead, Copper, Zinc	Under-ground	Past Producer		
7	Strange Silica Claim	i-06	AZ	La Paz	Silica			Unknown	Occurrence		
8	Strange Silica Claim	i-06	AZ	La Paz	Quartz, Silica			Unknown	Occurrence	Quartz	
9	Oro Fino Placers	i-06	AZ	La Paz	Gold	Silver	Iron, Tungsten and Lead	Unknown	Past Producer	Gold	Hematite
10	N/A										
11	N/A										

MAP #	SITE NAME	SEG-MENT	STATE	COUNTY	COM. 1	COM. 2	COM. 3	OPERA-TION TYPE	STATUS	ORE	GANGUE
12	French-American Prospect	p-10	AZ	La Paz			Mercury, Copper, Gold	Unknown	Occurrence	Cinnabar Gold	Quartz Siderite Tourmaline
13	Copper Bottom	p-10	AZ	La Paz	Silver, Gold	Copper		Unknown	Prospect		
14	Copper Bottom Mine	p-10	AZ	La Paz	Gold, Copper	Silver		Under-ground	Past Producer		
15	Bee Hive	p-10	AZ	La Paz	Gold	Copper		Unknown	Prospect		
16	La Chacha and Scott-Weaver	p-10	AZ	La Paz	Copper			Unknown	Occurrence		
17	Grace 1 and 2	qn-02	AZ	La Paz	Marble, Dimension, Limestone, General			Unknown	Occurrence	Limestone, Marble	
18	Grace 1 and 2	i-04	AZ	La Paz	Stone, Crushed /Broken			Unknown	Occurrence		
19	New York-Plomosa Prospect	x-05	AZ	La Paz	Gold			Unknown	Occurrence	Gold	
20	Guadalupe Mine	in-01	AZ	La Paz	Lead	Copper, Silver, Gold	Iron	Unknown	Past Producer	Anglesite Galena Hematite Malachite Pyrargyrite Siderite	
21	Hilltop	i-03	AZ	La Paz	Lead	Silver		Undergrou nd	Past Producer		

Com. – commodity
Ore - a naturally occurring solid material from which a metal or valuable mineral can be profitably extracted
Gangue - the commercially valueless material in which ore is found

A review of detailed topographic maps provided additional information regarding mining activities in the study area (HDR 2017b). Table 3.3-4 lists mine features that appear within the 4,000-foot corridor of the Proposed and Alternative segments. A listing of "prospect location" refers to a location that is labeled as either "prospect" or "prospects" on the topographic maps (HDR 2017b).

The information shown in Table 3.3-4 does not directly correlate with the mineral resource information provided in Table 3.3-3. For example, along Alternative Segment i-03, Table 3.3-4 lists three prospect locations, two mine shafts, and two open pit mines as being depicted on the topographic maps; whereas Table 3.3-3 indicates the presence of a historic underground lead and silver mine along this segment.

Table 3.3-4 Mine Features on Topographic Maps

SEGMENT	MINE FEATURE	COUNTY	PROJECT GEOGRAPHIC AREA
Proposed Action Route Segments			
p-01	7 borrow pits, 1 gravel pit	La Paz, Maricopa	East Plains and Kofa Zone
p-10	1 mine	La Paz	Copper Bottom Zone
Alternative Segments			
i-03	3 prospect locations, 2 mine shafts, 2 open pit mines	La Paz	East Plains and Kofa Zone
i-04	1 prospect location	La Paz	East Plains and Kofa Zone
x-05	4 to 5 prospect locations, 4 mine shafts	La Paz	Quartzsite Zone
qs-02	4 prospect locations, 2 mine shafts	La Paz	Quartzsite Zone

The BLM Land and Mineral Legacy Rehost 2000 System (LR2000) provides reports on BLM land and mineral use authorizations for oil, gas, and geothermal leasing, rights-of-way, coal and other mineral development, land and mineral title, mining claims, withdrawals, and classifications on Federal lands. The LR2000 data present land use types, such as rights-of-way and mining, authorized by the BLM for particular Public Land Survey System survey sections, which are generally 1-mile squares distributed across the landscape. Section 3.8 (Land Use) lists the authorizations within sections in the land use study area and provides a general overview of where the Project may need to coordinate with entities with existing mineral rights or resolve conflicts with existing uses.

Table 3.3-5 lists the mineral resources related to authorizations within the sections of the mineral resources study area (HDR 2017b). Most of the mineral resources authorizations occur in sections crossed by Proposed Segment p-02 and Alternative Segments d-01, x-05, i-04, in-04, qn-02, qs-02, and i-06. A few occurrences are in sections crossed by Proposed Segments p-06 and p-12 and by Alternative Segments i-03, x-06, and i-07. No mining claims located prior to the Surface Resources Act of July 23, 1955 were identified in the study area (Schively 2017).

The BLM makes mineral materials available to the public and local government agencies when it is possible and environmentally acceptable. As described in Section 3.3.1.1, the BLM classifies mineral resources it manages as leasable, locatable, or salable. Leasable minerals include fluid minerals such as oil, gas, coalbed methane, carbon dioxide, and geothermal resources; and solid minerals such as coal, sodium, and potash. Locatable minerals include metallic minerals such as gold, silver, copper, lead, zinc, and uranium; nonmetallic minerals such as alunite, asbestos, barite, gypsum, and mica; and certain varieties of stone. Locatable metallic and nonmetallic mineral potential in the study area is generally moderate to high. Salable minerals include construction materials such as sand, gravel, cinders, decorative rock, and building stone (BLM 2008c). These categories are discussed further below relative to historic, current, and potential for future resource development activities in the study area.

Table 3.3-5 LR2000 Database Records for Mineral Resources

CASETYPE CODE	CASETYPE NAME	SEGMENTS	TOTAL LR2000 LISTINGS
282104	Material Sites (Section 317)	i-04, in-01	2
315100	Oil and Gas Geophysical Exploration – Except Alaska	p-12, cb-03, x-08	1
360413	Community Pit – All	in-01, p-13, i-07	5
361112	Mineral Material Negotiated – Min	i-07	1
361113	Mineral Material Negotiated – All	i-03, i-04, in-01, x-04, qs-01, qs-02, x-07, i-07	7
384101	Mining Claim – Lode Claim	p-02, p-03, d-01, i-04, in-01, x-01, x-04, p-09, qn-02, qs-02, p-10, p-11, cb-01, cb-02, cb-03, i-06	706
384201	Mining Claim – Placer Claim	i-04, in-01, x-05, qn-02, qs-02, x-06, p-11, p-12, cb-03, i-06, x-08	398
384401	Millsite Claim	qs-01	1
386200	Mineral Patent Lode	x-05, p-09, qn-02, qs-02, p-10, p-11, cb-01, cb-02, cb-03, i-06	12
386300	Mineral Patent Placer	x-05, i-07, i-08s, ca-04	8
Total for Project			1,141

Leasable Minerals

Some geologic conditions create areas where high heat is accessible at or near the earth's surface. When this heat can be accessed and used economically, it becomes a geothermal resource.

The Project Area is generally favorable for deep, enhanced geothermal systems (HDR 2017b). The Dome Rock Mountain area has the most favorable geothermal potential. This area is crossed by Proposed and Alternative segments p-11, p-12, cb-03, x-08, qn-02, qs-02, i-06, and i-07.

The geothermal areas in the YFO planning area are characterized as low temperature. Potential uses of low temperature geothermal resources include residential and commercial space heating, greenhousing, aquaculture, crop and food processing, and heated swimming pools and spas (Tetra Tech 2005). BLM (2008c) did not anticipate geothermal resources would be developed in the YFO planning area over the following 15 years due to high costs when compared to the potential revenue generation.

One exploratory well was drilled by Gemini Oil, Gas, and Mineral Company in 1981, east of the Delaney Substation in Tonopah (Arizona Oil and Gas Conservation Commission 2016). This well was plugged and abandoned. No other oil or gas wells are recorded in the vicinity of the Project Area in Arizona. No oil or gas wells are recorded in or near the California portion of the Project Area in the California Division of Oil, Gas, and Geothermal Resources Well Database (California Division of Oil, Gas, and Geothermal Resources 2016). The oil and gas potential for the YFO planning area is characterized as moderate (BLM 2008c), however, Tetra Tech (2005) indicates that the only area with moderate potential for oil and gas occurrence is near Yuma.

There are no known carbon dioxide, coal, potash, sulfur, or sodium resources in the YFO planning area (Tetra Tech 2005). The Luke salt body, discovered in 1968, is mined west of the Project Area in Glendale, Arizona (Arizona Bureau of Geology and Mineral Technology 1987).

Locatable Minerals

Locatable metallic and nonmetallic minerals are known to occur in the study area. Locatable minerals are subject to exploration, development, and disposal by staking mining claims as authorized by the Mining Law of 1872, as amended. Rights to these resources are acquired by filing a mining claim and can include gold, silver, and certain mineral deposits that are not subject to lease or sale. Major, historical mineral findings were often expanded and extracted until the resource was exhausted in parts of the Arizona study area (BLM 2011b). As a result, many of the historical mines common to the area may no longer be operational or in existence. Undocumented mining sites on BLM-administered land in the study area are likely historical and focused on metallic mineral extraction (BLM 2011b).

The study area crosses three areas with moderate to high potential for occurrence of metallic mines that occur along I-10 (Tetra Tech 2005). The areas also generally correspond to the areas with higher numbers of mining claims as indicated in Table 3.3-5. The most recent published information from Arizona Department of Mines and Mineral Resources (DMMR) on active mines in Arizona (Arizona DMMR 2007) does not list any active mines for locatable minerals within 1 mile of the Project Area.

The study area is within several metallic mineral districts (AZGS 1983). Alternative Segments i-03, qs-02, and i-06 would cross gold deposits; and Proposed Segment p-12 would cross a manganese deposit (HDR 2017b). The Arizona Wilderness Act of 1990 withdrew the lands from mineral entry in the Eagletail Mountains. No mining operations are within the Eagletail WA.

The mineral land classification map and report for eastern Riverside County indicates that the California portion of the study area is in mineral resource zone MRZ-4 (California Department of Conservation 1994). MRZ-4 is defined as "areas of no known mineral occurrences where geologic information does not rule out either the presence or absence of significant mineral resources."

Potential mineral resources in the Riverside-San Bernardino County Management Area include both metallic and nonmetallic minerals. The southeast to south-central portion of the management area is classified as "having high to moderate potential for dimension stone, gold, and gemstone" (BLM 2011b). The American Flag Mine in the California portion of Proposed Segment p-18 is a past producer of gold, chalcopyrite, malachite, and pyrite. This is the only mine identified within the California portion of the study area (HDR 2017b). BLM (2016a) does not define any high potential mineral areas in the California portion of the study area.

Detailed information regarding specific metallic and nonmetallic mineral resources along the Alternative Segments is somewhat limited, and it is unclear whether any substantial mining activities are planned for the future within the study area of the Proposed Action and Alternative Segments.

Salable Minerals

In Arizona, the principal minerals produced in the study area are construction sand and gravel, and crushed stone (USGS 2016a). Tetra Tech (2005) indicates most of the study area has a moderate to high potential for salable minerals. As indicated in Table 3.3-4, nine borrow or gravel pits are depicted within the study area on the topographic maps, with eight of these features along Proposed Segment p-01. The segment crosses one borrow pit, which is also crossed by the existing DPV1. Aerial photographs for this area show considerable vegetation growth within the borrow pit, indicating it is not active.

The most recent published information from Arizona DMMR on active mines in Arizona (Arizona DMMR 2007) lists two active mines near the study area. Both of these mines are sand and gravel pits. The Plomosa Pit, operated by FNF Construction Inc., is southeast of Quartzsite and east of Alternative Segment x-05 on the west edge of the Plomosa Mountains. The Ehrenberg Wash Pit, operated by Mineral Aggregate Recycling Services, is about 0.5 mile south of Alternative Segment i-07, east of Blythe.

Tetra Tech (2005) determined a high potential for aggregate development in the YFO planning area along the I-10 corridor in La Paz County, which includes portions of the study area. Consistent with this determination, the YFO RMP proposed five community mineral resource pits in Ehrenberg South, NE Quartzsite, Dateland, Brenda, and Hart (HDR 2017b). Three of these, Ehrenberg South, NE Quartzsite, and Brenda, are along I-10 and would be in the vicinity of Alternative Segments that parallel the interstate at these locations.

The California Department of Conservation's Office of Mine Reclamation maintains a statewide database of mine location and operational information. The closest aggregate production areas in California are about 5 miles north of the Project Area (CGS 2012).

3.3.3.5 Soils and Soil Hazards

The soils in the study area are associated with a variety of climates, vegetative cover, topography, and geology (BLM 2008c). Their properties vary depending on environmental conditions, but were typically developed under hot, dry conditions characterized as having thermic or hyperthermic temperature regimes and arid or semi-arid moisture regimes.

The Natural Resources Conservation Service (NRCS) develops and maintains several soil geographic databases. STATSGO is a relatively general database, mapped on the US Geological Survey's 1:250,000-scale topographic quadrangle series, and is available for the entire study area. SSURGO is a more detailed database, mapped at scales ranging from 1:12,000 to 1:31,680, and is only available for limited portions of the study area. As an example, within the study area, as shown in Table 3.3-6, there are 15 STATSGO soil mapping units; whereas Appendix 3A, Table 3A-1 lists 128 SSURGO mapping units for the same area.

In order to accommodate comparisons of Action Alternative segments, only the STATSGO data is being used in this Technical Environmental Study; however, all available SSURGO data within the study area has been included in Appendix 3A; this includes NRCS's description of the two databases, map figures, tables of SSURGO soil properties by mapping unit and by route segments, and STATSGO soils properties by route segments. Numerous STATSGO soil units and associations within individual soil survey units are mapped in the study area. The soil associations are generally characterized as having moderate to severe water erosion potential and slight to high wind erosion potential (BLM 2012a). Riverside County identified the portion of the study area from Blythe to the Colorado River Substation as having a high to moderate wind erodibility rating (Riverside County 2015a).

The STATSGO map units in the study area are outlined in Table 3.3-6 and plotted on the STATSGO soils map (Appendix 1, Figure 3.3-7).

Sensitive soils in the study area include desert pavement, biological soil crusts, calcareous soils, and wetland soils (BLM 2008c). Sand dunes are mapped along the western end of the study area near the Colorado River Substation. In the most arid portions of the study area (generally outside of the Palo Verde Valley), soils commonly have a dense or rocky surface layer known as desert pavement, which protects finer-textured subsurface soils from erosion in the absence of abundant vegetation. Desert pavements occur on low, flat ridges separated by narrow channels (rills). Biological soil crusts, also known as biotic crusts or cryptogamic soils, are also found in the study area. These soils tend to fix nitrogen and contribute to the sparse nutrients available to desert plants. Similar to desert pavement, biotic crusts provide protection against wind and surface-sheet erosion (BLM 2012a). Calcareous soils (particularly gypsic and calcite soils) are sensitive to wind-erosion and form cemented caliche deposits that control water drainage.

Wetland soils in the study area are limited to only small areas along the Colorado River and across several low-lying basins associated with agricultural fields near the towns of Tonopah and Blythe. Similarly, alluvial soils can be found in the alluvial bottom lands associated with rivers and ephemeral drainage channels. These soils are often very diverse within the same area, ranging from rocky sands to salt flats or fine silty loams. Alluvial soils can be some of the most productive, and conversely some of the most barren, depending on watershed characteristics. Alluvial soils should be assessed in a site-specific manner relative to Project planning (BLM 2006).

Table 3.3-6 Summary of STATSGO Mapped Soils within the Study Area

GENERAL MAP UNIT (STATSGO SOIL ASSOCIATION)	SEGMENT LOCATION	DESCRIPTION[a]	WIND ERODIBILITY GROUP[b,c]	SHRINK/ SWELL POTENTIAL[d]	CORROSION RISK[e]	
					CONCRETE	UNCOATED STEEL
Rositas-Ripley-Indio-Gilman (s275)	Colorado River and California Zone (ca-01, ca-02, ca-04, ca-05, ca-06, p-15w, p-16, x-09, x-10, x-11, x-12, x-13, x-15, x-16)	The soil association consists of very deep, well, or moderately well to somewhat excessively drained soils that formed in stratified stream alluvium, alluvium from mixed rock sources or from sandy aeolian material. The soils are on floodplains and alluvial fans, lacustrine basins, floodplains, dunes or sand sheets and have slopes of 0 to 30 percent.	1–6	0	Low–Moderate	Moderate–High
Rositas-Orita-Carrizo-Aco (s1041)	Colorado River and California Zone (ca-02, ca-06, ca-07, ca-09, p-16, p-17, p-18, x-15, x-16)	The soil association consists of very deep, well drained to excessively drained soils formed in sandy aeolian material, alluvium from mixed sources, and mixed igneous alluvium. The soils are on dunes and sand sheets, fan remnants and terraces, floodplains, fan piedmonts, and bolson floors. Slope ranges from 0 to 30 percent.	1–3, 5–6	0.14, 1.00	Low–Moderate	Moderate
Rillito-Gunsight (s1140)	Colorado River and California Zone (p-17, p-18)	The soil association consists of very deep, somewhat excessively drained soils that formed in mixed alluvium. Gunsight soils are strongly calcareous. The soil association is on fan terraces or stream terraces. Slopes are predominantly 0 to 60 percent.	4L–6	0.5	Moderate	Moderate–High

GENERAL MAP UNIT (STATSGO SOIL ASSOCIATION)	SEGMENT LOCATION	DESCRIPTION[a]	WIND ERODIBILITY GROUP[b,c]	SHRINK/ SWELL POTENTIAL[d]	CORROSION RISK[e]	
					CONCRETE	UNCOATED STEEL
Rositas-Dune land-Carsitas (s1136)	Colorado River and California Zone (ca-09, p-18, x-19)	The soil association consists of very deep, somewhat excessively drained soils formed in sandy aeolian material or alluvium from granitoid and/or gneissic rocks. The soils are on dunes and sand sheets, alluvial fans, fan aprons, valley fills, dissected remnants of alluvial fans and in drainageways. Slope ranges from 0 to 30 percent.	1, 2, 6	0	Moderate	Moderate
Vaiva-Quilotosa-Hyder-Cipriano-Cherioni (s1141)	Colorado River and California Zone (ca-09, p-18, x-19)	The soil association consists of very shallow and shallow, well drained to somewhat excessively drained soils formed in slope alluvium from granite and gneiss, and alluvium from rhyolite and related volcanic rocks. The soils are on hills and mountains, or fan terraces with slopes of 1 to 70 percent.	None available	0.5	Low–Moderate	Moderate

GENERAL MAP UNIT (STATSGO SOIL ASSOCIATION)	SEGMENT LOCATION	DESCRIPTION[a]	WIND ERODIBILITY GROUP[b,c]	SHRINK/ SWELL POTENTIAL[d]	CORROSION RISK[e]	
					CONCRETE	UNCOATED STEEL
Ligurta-Gunsight-Cristobal (s290)	Colorado River and California Zone (cb-10, i-08s, p-15e, x-11) Copper Bottom Zone (cb-03, cb-04, cb-05, cb-06, i-06, i-07, p-09, p-11, p-13, p-14, x-08) East Plains and Kofa Zone (i-04, in-01, p-06) Quartzsite Zone (p-07, p-08, qn-01, qn-02, qs-01, qs-02, i-05, x-05, x-06, x-07)	The soil association series consists of very deep, well drained to somewhat excessively drained, strongly saline soils that formed in fan alluvium weathered from a wide variety of rocks. The soils are on fan terraces or stream terraces with slopes of 0 to 60 percent.	5, 6	1	Moderate–High	Moderate–High

GENERAL MAP UNIT (STATSGO SOIL ASSOCIATION)	SEGMENT LOCATION	DESCRIPTION[a]	WIND ERODIBILITY GROUP[b,c]	SHRINK/ SWELL POTENTIAL[d]	CORROSION RISK[e]	
					CONCRETE	UNCOATED STEEL
Schenco-Rock outcrop-Laposa (s295)	Copper Bottom Zone (cb-01, cb-02, cb-03, cb-04, cb-05, cb-06, i-06, p-09, p-10, p-11, p-12, x-08) East Plains and Kofa Zone (i-04, in-01, p-06) Quartzsite Zone (qn-02, qs-01, qs-02, x-05)	The soil association consists of very shallow and shallow to moderately deep, well drained to somewhat excessively drained soils formed in slope alluvium from schist, granite, gneiss, rhyolite, and aeolian deposits. The soils are on hill slopes, hills and mountains and have slopes of 3 to 75 percent. Average annual precipitation is about 4 to 8 inches and the mean annual temperature is about 72 to 73 °F.	8	None available	None available	Moderate
Hyder-Coolidge-Cipriano-Cherioni (s289)	East Plains and Kofa Zone (d-01, i-03, i-04, in-01, p-03, p-04, p-05, p-06, x-01, x-02, x-03, x-04) Quartzsite Zone (x-05)	The soil association consists of very shallow and shallow to very deep, well drained to somewhat excessively-drained soils that formed in fan or stream alluvium from rhyolite and related volcanic rocks. The soils are on fan terraces, stream terraces, mountains, and hills and have slopes of 0 to 70 percent.	None available	1	Low–Moderate	Moderate
Momoli-Denure-Carrizo (s281)	East Plains and Kofa Zone (d-01, p-01)	The soil association consists of very deep, well drained to excessively drained soils formed in fan alluvium and aeolian deposits and mixed igneous alluvium. The soils are on stream terraces and fan terraces, alluvia fans, relict basin floors, floodplains, fan piedmonts, and boldon floors and have slopes of 0 to 15 percent.	3, 5, 6	None available	Low–Moderate	Moderate

GENERAL MAP UNIT (STATSGO SOIL ASSOCIATION)	SEGMENT LOCATION	DESCRIPTION[a]	WIND ERODIBILITY GROUP[b,c]	SHRINK/ SWELL POTENTIAL[d]	CORROSION RISK[e]	
					CONCRETE	UNCOATED STEEL
Pahaka-Estrella-Antho (s299)	East Plains and Kofa Zone (d-01, i-01, i-02, i-03, p-01, p-02, p-03, p-04, p-05, p-06, x-01, x-02, x-03, x-04)	The soil association consists of very deep, well drained to somewhat excessively drained soils that formed in mixed and stratified fan alluvium. The soils are on alluvial fans, terraces, and floodplains with slopes ranging from 0 to 5 percent.	3, 5	0.06, 0.08, 0.09	Low	Moderate
Rillito-Gunsight-Denure-Chuckawalla (s288)	East Plains and Kofa Zone (d-01, i-01, i-02, i-03, p-01, p-06, x-01, x-02, x-04)	The soil association consists of very deep, well drained to somewhat excessively drained soils that formed in mixed alluvium. Gunsight soils are strongly calcareous. The soils are formed in alluvium from mixed sources and are on fan terraces or stream terraces and relict basin floors. Slopes are 0 to 60 percent.	3, 4L, 5, 6, 8	1	Low–Moderate–High	Moderate–High
Rock outcrop-Quilotosa-Hyder-Gachado (s294)	East Plains and Kofa Zone (d-01, p-01)	The soil association consists of very shallow and shallow, well drained to somewhat excessively drained soils that formed from granitic and metamorphic rocks or in alluvium from rhyolite and related volcanic rocks. The soils are on hills and mountains and have slopes of 1 to 70 percent.	None available	None available	Low	None available

GENERAL MAP UNIT (STATSGO SOIL ASSOCIATION)	SEGMENT LOCATION	DESCRIPTION[a]	WIND ERODIBILITY GROUP[b,c]	SHRINK/ SWELL POTENTIAL[d]	CORROSION RISK[e]	
					CONCRETE	UNCOATED STEEL
Rock outcrop-Quilotosa-Momoli (s293)	East Plains and Kofa Zone (i-03, x-04)	The soil association consists of very shallow and shallow to very deep, somewhat excessively-drained to excessively drained soils that formed from granitic and metamorphic rocks or in fan alluvium and aeolian deposits. The soils are on hills and mountains, stream terraces, and fan terraces and have slopes of 0 to 65 percent.	6	None available	Moderate	Moderate
Rock outcrop-Lehmans-Gran (s316)	East Plains and Kofa Zone (i-04, p-06) Quartzsite Zone (x-05)	The soil association consists of very shallow and shallow, well drained soils formed in slope alluvium-colluvium from volcanic rock. The soils are on pediments, hill slopes, and mountain slopes and have slopes of 1 to 65 percent.	None available	None available	None available	None available
Valencia-Estrella-Cuerda (s300)	East Plains and Kofa Zone (i-03, p-04, p-05, p-06, x-01, x-02, x-03, x-04)	The soil association consists of very deep, well drained soils formed in recent alluvium and stratified mixed alluvium. The soils are on floodplains and alluvial fans and have slopes of 0 to 5 percent.	3, 5	0.06, 0.08, 0.09	Low–Moderate	Moderate

[a] Soil Survey Staff, NRCS. Official Soil Series Descriptions. https://www.nrcs.usda.gov/wps.portal/nrcs/detail/soils/home/. November 9, 2016. Descriptions are a compilation of the descriptions for each individual soil map unit.

[b] Soil Survey Staff, NRCS. Web Soil Survey. http://websoilsurvey.nrcs.usda.gov/. November 9, 2016. Soil characteristics are a compilation of the data for each individual soil map unit.

[c] A wind erodibility group consists of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible.

[d] Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

[e] Tecopa map unit description was used; no other soil map unit descriptions were available.

The study area contains soils mapped as prime farmland. Prime farmland and other unique or important farmland are addressed in Land Use, Section 3.8.

Corrosivity refers to a soil's capacity to induce chemical reactions that will corrode or weaken metals and concrete. Corrosive soils typically have low pH and high concentration of chlorides and sulfates. High-sulfate soils are corrosive to concrete and may reduce its strength. Low pH and/or low resistivity soils may corrode buried or partially buried metal structures. There is potential that certain localized areas of the study area are underlain by soils that are moderately to highly corrosive (NRCS 2016a).

Soils with high shrink-swell (expansive) characteristics may underlay portions of the study area. Shrink-swell potential is the extent to which the soil shrinks as it dries out or swells when it gets wet (NRCS 2016b). The extent of shrinking and swelling is influenced by the amount and kind of clay in the soil. Shrinking and swelling of soils can damage building foundations, roads, and other structures.

Soil collapse typically occurs in recent (less than 10,000 years old) soils that were deposited in an arid or semi-arid environment. Collapsible soils are commonly associated with human-made fill, wind-laid sands and silts, and alluvial fan and mudflow sediments deposited during flash floods. They predominantly occur at the base of mountains or in wind deposits. These soils typically contain minute pores and voids and may be partially supported by clay or silt, or chemically cemented with carbonates. When saturated, collapsible soils undergo a rearrangement of their grains, and the water removes the cohesive (or cementing) material, causing rapid settlement (Riverside County 2015a).

Expansive, corrosive, or collapsible soil characteristics are identified locally through site-specific geotechnical testing, and associated hazards can be addressed through management of these soil properties during construction or engineering design.

Mines and mineral prospects for asbestos are known in southern California and in Arizona. The nearest prospect in Riverside County is approximately 60 miles west of the Project Area (USGS and California Geological Society 2011). In Arizona, the nearest asbestos prospect is in the Dome Mountains, north of the Project Area (Harris 2004). No active or abandoned mines were reported near the Project Area.

Valley fever (*coccidioidomycosis*) is another potential hazard naturally occurring in some soils in the Project Area. Valley fever spores survive in the top 2 to 12 inches of soil in many parts of Arizona and California. When soil is disturbed by activities such as grading, digging, vehicle operation on dirt roads, or high winds, the fungal spores can become airborne and potentially inhaled (BLM 2015a). Since the spores are approximately 2 to 5 microns in size, the assumption is that the airborne spores will fly with, and behave similarly to, dust in the wind (Sprigg et al. 2014). These spores, if inhaled in high enough concentrations, can cause a person to become sick with an illness called valley fever. Typical symptoms of valley fever include fatigue, fever, cough, headache, shortness of breath, rash, muscle aches, and joint pain (BLM 2015a). Most people who inhale the spores do not become ill, or, if they do, it is usually a mild illness from which they soon recover. However, in some cases, people become severely ill with complications of the disease and can need hospitalization. Symptoms of advanced valley fever include chronic pneumonia, meningitis, skin lesions, and bone or joint infections (Valdivia et al. 2006).

Approximately 50 cases per year were reported in Riverside County for the years 2004 through 2007 (Williams 2009), which works out to approximately 2.5 cases per 100,000 population. In Arizona, the average number of reported cases per 100,000 population in 2015 was 66.1 in La Paz County and 131 in Maricopa County (Arizona Department of Health Services 2015).

3.3.3.6 Zone-Specific Conditions

The geologic unit map symbols in Tables 3.3-7 through 3.3-14 are presented on Figures 3.3-2a-c (Appendix 1). STATSGO soils map and data are presented in this section; SSURGO soils maps and data are located in Appendix 3A.

East Plains and Kofa Zone

Geology

Proposed Action Segments p-01 through p-06

The geology along these segments is characterized by alluvium and bedrock consisting of Holocene surficial deposits, Late and Middle Pleistocene surficial deposits, Middle Miocene to Oligocene volcanic rocks, Early Pleistocene surficial deposits, Cretaceous to Upper Jurassic sedimentary rocks with minor volcanic rocks, and/or undivided Quaternary surficial deposits. Table 3.3-7 summarizes the surface geology along these Proposed Action segments.

Table 3.3-7 Description of Segments p-01 through p-06

SEGMENT	LENGTH (MILES)	GEOLOGIC UNITS
p-01	26	23.5 miles Alluvium – Qy (Holocene Surficial Deposits) and Qm (Late and Middle Pleistocene Surficial Deposits) 2.5 miles Bedrock – Tv (Middle Miocene to Oligocene Volcanic Rocks)
p-02	1	1 mile Alluvium – Qy (Holocene Surficial Deposits)
p-03	3	2.5 miles Alluvium – Qy (Holocene Surficial Deposits) 0.5 mile Bedrock – Tv (Middle Miocene to Oligocene Volcanic Rocks)
p-04	6	6 miles Alluvium – Qy (Holocene Surficial Deposits) and Qm (Late and Middle Pleistocene Surficial Deposits)
p-05	2	1 mile Alluvium – Qy (Holocene Surficial Deposits) 1 mile Bedrock – Tv (Middle Miocene to Oligocene Volcanic Rocks)
p-06	36	7 miles Alluvium – Qy (Holocene Surficial Deposits) 13.5 miles Alluvium – Qm (Late and Middle Pleistocene Surficial Deposits) 3 miles Alluvium – Qo (Early Pleistocene Surficial Deposits) 6 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided) 4.5 miles Bedrock – Tv (Middle Miocene to Oligocene Volcanic Rocks) 1.5 miles Bedrock – KJs (Cretaceous to Upper Jurassic Sedimentary Rocks with Minor Volcanic Rocks)

Alternative Segments d-01, i-01 through i-04, in-01, and x-01 through x-04

The geology along the Alternative Segments within this zone is characterized as either alluvium or bedrock and consist of Holocene surficial deposits, Late and Middle Pleistocene surficial deposits, Early Pleistocene surficial deposits, Middle Miocene to Oligocene volcanic rocks, Middle Proterozoic granitic rocks, and/or undivided Quaternary surficial deposits. Table 3.3-8 summarizes the surface geology along the Alternative Segments within this zone.

Table 3.3-8 Description of Segments d-01, i-01 through i-04, in-01, x-01 through x-04

SEGMENT	LENGTH (MILES)	GEOLOGIC UNITS
d-01	25	11 miles Alluvium – Qy (Holocene Surficial Deposits) 14 miles Alluvium – Qm (Late and Middle Pleistocene Surficial Deposits)
i-01	8	8 miles Alluvium – Qy (Holocene Surficial Deposits)
i-02	3	3 miles Alluvium – Qy (Holocene Surficial Deposits) 0.5-mile Alluvium – Qm (Late and Middle Pleistocene Surficial Deposits)
i-03	20	9.5 miles Alluvium – Qy (Holocene Surficial Deposits) 8 miles Alluvium – Qm (Late and Middle Pleistocene Surficial Deposits) 1 mile Alluvium – Qo (Early Pleistocene Surficial Deposits) 0.5-mile Bedrock – Tv (Middle Miocene to Oligocene Volcanic Rocks) 1 mile Bedrock – Yg (Middle Proterozoic Granitic Rocks)
i-04	10	1.5 miles Alluvium – Qm (Late and Middle Pleistocene Surficial Deposits) 6 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided) 3 miles Bedrock – Tv (Middle Miocene to Oligocene Volcanic Rocks)
in-01	14	9.5 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided) 3.5 miles Alluvium – Qm (Late and Middle Pleistocene Surficial Deposits) 0.5-mile Bedrock – Tv (Middle Miocene to Oligocene Volcanic Rocks)
x-01	8	8 miles Alluvium – Qy (Holocene Surficial Deposits)
x-02	7	6.5 miles Alluvium – Qy (Holocene Surficial Deposits) 0.5-mile Alluvium – Qm (Late and Middle Pleistocene Surficial Deposits)
x-03	6	6 miles Alluvium – Qy (Holocene Surficial Deposits)
x-04	23	7 miles Alluvium – Qy (Holocene Surficial Deposits) 16 miles Alluvium – Qm (Late and Middle Pleistocene Surficial Deposits)
Alt. SCS Dist. Line	3	3 miles Alluvium – Qm (Late and Middle Pleistocene Surficial Deposits)

Minerals

Proposed Action Route Segments p-01 through p-06

No resources are provided in the USGS Mineral Resources Data System for the study area encompassing Proposed Segments p-01 through p-06. However, topographic maps note seven borrow pits and one gravel pit within the Segment p-01 study area (Table 3.3-4).

Alternative Segments d-01, i-01 through i-04, in-01, and x-01 through x-04

As noted in Table 3.3-3, the Grace 1 and 2, a crushed/broken stone occurrence, is located in the study area along Alternative Segment i-04. The Guadalupe Mine is located in the Segment in-01 study area and the Hilltop Mine is located along the Segment i-03 study area. In addition, topographic maps indicate that there are three prospects, two mine shafts, and two open pit mines within the Segment i-03 and one prospect within the Segment i-04 study areas.

Soils

Proposed Action Route Segments p-01 through p-06

Two of the eight STATSGO soil associations (Ligurta-Gunsight-Cristobal, Schenco-Rock outcrop-Laposa) mapped along Segments p-01 through p-06 include deep, well drained to somewhat excessively drained, soils. Generally, the soils are on fan terraces, stream terraces, floodplains, mountains, and hills. Several other soil associations (Hyder-Coolidge-Cipriano-Cherioni, Momoli-Denure-Carrizo, Pahaka-Estrella-Antho, Valencia-Estrella-Cuerda, Rock outcrop-Quilotosa-Hyder-Gachado, Rock outcrop-Lehmans-Gran) include very shallow and shallow to moderately deep, well drained to somewhat excessively drained soils formed in slope alluvium from schist, granite, gneiss, rhyolite, and eolian deposits. The soils are on hill slopes, hills, and mountains. The remaining soil association (Rillito-Gunsight-Denure-Chuckwalla) are also very shallow and shallow, well drained soils formed in slope alluvium-colluvium from volcanic rock, generally located on pediments, hill slopes, and mountain slopes (Table 3.3-6). SSURGO data are mapped and summarized in Appendix 3A (Figure 3A-1 through Figure 3A-6 and Tables 3A-1 through 3A-3). Of these soil associations, the Momoli-Denure-Carrizo, Valencia-Estrella-Cuerda, and Rillito-Gunsight-Denure-Chuckwalla have a moderate susceptibility to wind erosion.

Alternative Segments d-01, i-01 through i-04, in-01, and x-01 through x-04

The STATSGO soils mapped along the Alternative Segments in the East Plains and Kofa Zone are the same as the Proposed Segments (Table 3.3-6).

Quartzsite Zone

Geology

Proposed Action Route Segments p-07 and p-08

The geology of Segments p-07 through p-08 is characterized as either bedrock or alluvium with undivided Quaternary surficial deposits, Cretaceous to Upper Jurassic sedimentary rocks with minor volcanic rocks, and/or Jurassic volcanic rocks. Table 3.3-9 summarizes the surface geology along the Proposed Action segments within this zone.

Table 3.3-9 Description of Segments p-07 and p-08

SEGMENT	LENGTH (MILES)	GEOLOGIC UNITS
p-07	2	2 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided)
p-08	1	1 mile Alluvium – Q (Quaternary Surficial Deposits, Undivided)

Alternative Segments qn-01 and qn-02, qs-01 and qs-02, i-05, x-05, x-06 and x-07

Table 3.3-10 summarizes the surface geology of the Alternative segments within this zone. The geology crossed by these Alternative segments is characterized as either bedrock or alluvium and features undivided, Quaternary surficial deposits and/or Jurassic granite rocks.

Table 3.3-10 Description of Segments qn-01 and qn-02, qs-01 and qs-02, i-05, x-05, x-06 and x-07

SEGMENT	LENGTH (MILES)	GEOLOGIC UNITS
qn-01	1	1 mile Alluvium – Q (Quaternary Surficial Deposits, Undivided)
qn-02	11	9.5 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided) 1.5 miles Bedrock – Jg (Jurassic Granitic Rocks)
qs-01	3	3 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided)
qs-02	5	4.5 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided) 0.5-mile Bedrock – Jg (Jurassic Granitic Rocks)
i-05	3	3 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided)
x-05	10	10 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided)
x-06	9	9 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided)
x-07	8	8 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided)

Minerals

Proposed Action Route Segments p-07 and p-08

No resources are provided in the USGS Mineral Resources Data System for the study area encompassing Proposed Segments p-07 and p-08.

Alternative Segments qn-01 and qn-02, qs-01 and qs-02, i-05, x-05, x-06 and x-07

There are several mineral resources noted in the USGS Mineral Resources Data System (Table 3.3-3) in the Quartzsite Zone including the Oro Fino Gold Placers and Grace 1 and 2 occurrences (marble/limestone) in the Segment qn-02 study area and the Shadow Mountain Claims and Julian Mine Group in the Segment qs-02 study area. The New York-Plomosa prospect is within the Segment x-05 study area. In addition, topographic maps indicate four to five prospects within the Segment x-05 study area and four prospects and two mine shafts within the Segment qs-02 study area (Table 3.3-4).

Soils

Proposed Action Route Segments p-07 and p-08

The STATSGO soils mapped for Segments p-07 and p-08 (Ligurta-Gunsight-Cristobal) consist of very deep, well drained to somewhat excessively drained, strongly saline soils that formed in fan alluvium weathered from a wide variety of rocks. The soils are on fan terraces or stream terraces. Susceptibility to wind erosion is low to moderate (Table 3.3-6).

Alternative Segments qn-01 and qn-02, qs-01 and qs-02, i-05, x-05, x-06 and x-07

Two STATSGO soils (Ligurta-Gunsight-Cristobal and Schenco-Rock outcrop-Laposa) are mapped for these segments. The Ligurta-Gunsight-Cristobal association is very deep, well drained to somewhat excessively drained, strongly saline soils that formed in fan alluvium weathered from a wide variety of rocks. The soils are on fan terraces or stream terraces. The Schenco-Rock outcrop-Laposa association consists of very shallow and shallow to moderately deep, well drained to somewhat excessively drained soils formed in slope alluvium from schist, granite, gneiss, rhyolite, and eolian deposits. The soils are on hill slopes, hills and mountains. Susceptibility to wind erosion is low. In addition, Rock outcrop-Lehmans-Gran is mapped along Segment x-05 and consists of very shallow and shallow, well drained soils formed in slope alluvium-colluvium from volcanic rock. The soils are on pediments, hill slopes, and mountain slopes (Table 3.3-6). Of these soils, none have a high susceptibility to wind erosion.

Copper Bottom Zone

Geology

Proposed Action Segments p-9 through p-14

Geology crossed by Segments p-9 through p-14 is characterized as either bedrock or alluvium and consists of Jurassic volcanic rocks, Early Pleistocene to Latest Pliocene surficial deposits, Pliocene to Middle Miocene deposits, and/or Holocene River Alluvium. Table 3.3-11 summarizes the surface geology along the Proposed Action segments.

Table 3.3-11 Description of Segments p-9 through p-14

SEGMENT	LENGTH (MILES)	GEOLOGIC UNITS
p-09	7	6 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided) 0.8-mile Bedrock – KJs (Cretaceous to Upper Jurassic Sedimentary Rocks with Minor Volcanic Rocks) 0.2-mile Bedrock – Jv (Jurassic Volcanic Rocks)
p-10	1	1 mile Bedrock – Jv (Jurassic Volcanic Rocks)
p-11	4	0.5-mile Alluvium – Qo (Early Pleistocene to Latest Pliocene Surficial Deposits) 3.5 miles Bedrock – Jv (Jurassic Volcanic Rocks)
p-12	3	3 miles Alluvium – Qo (Early Pleistocene to Latest Pliocene Surficial Deposits)
p-13	3	2.5 miles Alluvium – Qo (Early Pleistocene to Latest Pliocene Surficial Deposits) 1 mile Bedrock – Tsy (Pliocene to Middle Miocene Deposits)
p-14	1	1 mile Alluvium – Qo (Early Pleistocene to Latest Pliocene Surficial Deposits)

Alternative Segments cb-01 through cb-06, i-06, i-07, i-08s, and x-08

The geology of the Copper Bottom Pass Alternative segments is characterized as bedrock or alluvium and consists of Jurassic volcanic rocks, early Pleistocene or Latest Pliocene surficial deposits, Middle Miocene to Oligocene sedimentary rocks, and Pliocene to Middle Miocene Deposits.

The geology along Segments i-06, i-07, and x-08 is characterized as either bedrock or alluvium and consists of Early Pleistocene to Latest Pliocene surficial deposits, undivided Quaternary surficial deposits, Jurassic volcanic rocks, Jurassic granite rocks, and/or Holocene River Alluvium. Table 3.3-12 summarizes the surface geology along the Alternative segments.

Table 3.3-12 Description of Segments cb-01 through cb-06, i-06, i-07, and x-08

SEGMENT	LENGTH (MILES)	GEOLOGIC UNITS
cb-01	3	3 miles Bedrock – Jv (Jurassic Volcanic Rocks)
cb-02	2	2 miles Bedrock – Jv (Jurassic Volcanic Rocks)
cb-03	4	0.5-mile Alluvium – Qo (Early Pleistocene to Latest Pliocene Surficial Deposits) 3.5 miles Bedrock – Jv (Jurassic Volcanic Rocks)
cb-04	2	1 mile Alluvium – Qo (Early Pleistocene to Latest Pliocene Surficial Deposits) 1 mile Bedrock – Jv (Jurassic Volcanic Rocks)
cb-05	4	3 miles Alluvium – Qo (Early Pleistocene to Latest Pliocene Surficial Deposits) 0.5-mile Bedrock – Tsm (Middle Miocene to Oligocene Sedimentary Rocks) 1 mile Bedrock – Tsy (Pliocene to Middle Miocene Deposits)
cb-06	2	2 miles Alluvium – Qo (Early Pleistocene to Latest Pliocene Surficial Deposits)
i-06	7	1 mile Alluvium – Qo (Early Pleistocene to Latest Pliocene Surficial Deposits) 2 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided) 1 mile Bedrock – Jv (Jurassic Volcanic Rocks) 1 mile Bedrock – Jg (Jurassic Granitic Rocks) 2 miles Bedrock – J? (Jurassic and Triassic Sedimentary and Volcanic Rocks)
i-07	6	6 miles Alluvium – Qo (Early Pleistocene to Latest Pliocene Surficial Deposits)
x-08	1	1 mile Alluvium – Qo (Early Pleistocene to Latest Pliocene Surficial Deposits)

Minerals

Proposed Action Segments p-09 through p-14

The USGS Mineral Resources Data System includes several mineral resources within the Proposed Segment p-10 study area, including the French-American prospect, the Copper Bottom prospect, the Copper Bottom Mine, the Bee Hive prospect, and the La Chacha & Scott Weaver copper occurrence. The La Paz District, a past producer of gold and silver, is located within the Proposed Segment p-11 study area (Table 3.3-3). In addition, one mine appears on topographic maps within the Segment p-10 study area (Table 3.3-4).

Alternative Segments cb-01 through cb-06, i-06, i-07, i-08s, and x-08

Within the Alternative Segment i-06 study area, the Strange Silica Claims, Oro Fino Placers, and an unnamed occurrence of kyanite are present (Table 3.3-3).

Soils

Proposed Action Segments p-09 through p-14

Two STATSGO soil associations (Ligurta-Gunsight-Cristobal and Schenco-Rock outcrop-Laposa) are mapped for Segments p-09 through p-14. The Ligurta-Gunsight-Cristobal association is very deep, well drained to somewhat excessively drained, strongly saline soils that formed in fan alluvium weathered from a wide variety of rocks. The soils are on fan terraces or stream terraces. The Schenco-Rock outcrop-Laposa association consists of very shallow and shallow to moderately deep, well drained to somewhat excessively drained soils formed in slope alluvium from schist, granite, gneiss, rhyolite, and aeolian deposits. The soils are on hill slopes, hills, and mountains (Table 3.3-6). These soil associations have a low to moderate susceptibility to wind erosion.

Alternative Segments cb-01 through cb-06, i-06, i-07, i-08s, and x-08

The STATSGO soil associations mapped for the Action Alternative segments are the same as the Proposed segments (Table 3.3-6).

Colorado River and California Zone

Geology

Proposed Action Segments p-15e through p-18

Segment p-16 crosses Pleistocene sedimentary rocks along the western edge of the Palo Verde Valley. The geology along the remainder of Segment p-16 and the other segments is classified as alluvium with undivided Quaternary surficial deposits. Table 3.3-13 summarizes the surface geology along the Proposed segments.

Table 3.3-13 Description of Segments p-15w through p-18

SEGMENT	LENGTH (MILES)	GEOLOGIC UNITS
p-15e	3	2 miles Alluvium – Qo (Early Pleistocene to Latest Pliocene Surficial Deposits) 1 mile Alluvium – Qr (Holocene River Alluvium)
p-15w	7	7 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided)
p-16	5	4.6 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided)
p-17	3	3 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided)
p-18	2	2 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided)

Alternative Segments ca-01, ca-02, ca-04 through ca-07, ca-09, cb-10, i-08s, x-09 through x-16, and x-19

The Alternative segments in this zone would cross mostly alluvium with undivided Quaternary surficial deposits and extensive marine and nonmarine sand deposits, with some areas of Pleistocene marine and nonmarine sedimentary rocks. The geology along Segment i-08s is characterized as either bedrock or alluvium and consists of Early Pleistocene to Latest Pliocene surficial deposits and Holocene River Alluvium.

Table 3.3-14 summarizes the surface geology along the Alternative segments.

Table 3.3-14 Description of Segments ca-01, ca-04 through ca-07, ca-09, i-08s, x-09 through x-16, and x-19

SEGMENT	LENGTH (MILES)	GEOLOGIC UNITS
ca-01	7	7 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided)
ca-02	4	3 miles Alluvium - Q (Quaternary Surficial Deposits, Undivided) 0.5 mile Qoa – (Pleistocene Marine and Nonmarine Sedimentary Rocks)
ca-04	1	1 mile Alluvium – Q (Quaternary Surficial Deposits, Undivided)
ca-05	7	7 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided)
ca-06	3	3 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided)
ca-07	3	3 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided)
ca-09	3	1.5 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided) 1.5 miles Alluvium – Qs (Extensive Marine and Nonmarine Sand Deposits)
cb-10	2	1.5 mile Alluvium – Qo (Early Pleistocene to Latest Pliocene Surficial Deposits) 0.5-mile Alluvium – Qr (Holocene River Alluvium)
i-08s	1	0.5-mile Alluvium – Qo (Early Pleistocene to Latest Pliocene Surficial Deposits) 0.5-mile Alluvium – Qr (Holocene River Alluvium)
x-09	1	1 mile Alluvium – Q (Quaternary Surficial Deposits, Undivided)
x-10	1	1 mile Alluvium – Q (Quaternary Surficial Deposits, Undivided)
x-11	2	2 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided)
x-12	1	1 mile Alluvium – Q (Quaternary Surficial Deposits, Undivided)
x-13	2	2 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided)
x-15	1	1 mile Alluvium – Q (Quaternary Surficial Deposits, Undivided)
x-16	2	2 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided)
x-19	1	0.5 miles Alluvium – Q (Quaternary Surficial Deposits, Undivided) 0.5 miles Alluvium – Qs (Extensive Marine and Nonmarine Sand Deposits)

Minerals

Proposed Action Segments p-15e through p-18

The American Flag Mine is located within the Proposed Segment p-18 study area (Table 3.3-3).

Alternative Segments ca-01, ca-02, ca-04 through ca-07, ca-09, cb-10, i-08s, x-09 through x-16, and x-19

No resources are provided in the USGS Mineral Resources Data System for the study area encompassing Alternative segments in the Colorado River and California Zone.

Soils

Proposed Action Segments p-15e through p-18

Five of the STATSGO soil associations (Rositas-Ripley-Indio-Gilman, Rositas-Orita-Carrizo-Aco, Rillito-Gunsight, Rositas-Dune land-Carsitas, and Ligurta-Gunsight-Cristobal) mapped along Segments p-15e through p-18 generally include very deep, well, or moderately well to excessively drained soils that formed in stratified stream alluvium, alluvium from mixed rock sources, or from sandy aeolian material. The soils are on floodplains and alluvial fans, fan remnants and terraces, lacustrine basins, floodplains, dunes, or sand sheets. TheVaiva-Quilotosa-Huder-Cipriano-Cherioni soil association consists of very shallow and shallow, well drained to somewhat excessively drained soils formed in slope alluvium from granite and gneiss, and alluvium from rhyolite and related volcanic rocks. The soils are on hills and mountains, or fan terraces (Table 3.3-6). Of these soil associations, Rositas-Ripley-Indio-Gilman, Rositas-Orita-Carrizo-Aco, and Rositas-Dune land-Carsitas have a high susceptibility to wind erosion.

Alternative Segments ca-01, ca-02, ca-04 through ca-07, ca-09, cb-10, i-08s, x-09 through x-16, and x-19

The Rositas-Ripley-Indio-Gilman, Rositas-Orita-Carrizo-Aco, Rositas-Dune land-Carsitas, and Ligurta-Gunsight-Cristobal STATSGO soil associations mapped along the segments listed above generally consist of very deep, well, or moderately well to excessively drained soils that formed in stratified stream alluvium, alluvium from mixed rock sources or from sandy aeolian material. The soils are on floodplains and alluvial fans, fan remnants and terraces, lacustrine basins, floodplains, dunes or sand sheets, and valley fills. Other soils (Vaiva-Quilotosa-Huder-Cipriano-Cherioni) consist of very shallow and shallow, well drained to somewhat excessively drained soils formed in slope alluvium from granite and gneiss, and alluvium from rhyolite and related volcanic rocks. The soils are on hills and mountains, or fan terraces (Table 3.3-6). Of these soil associations, Rositas-Ripley-Indio-Gilman, Rositas-Orita-Carrizo-Aco, and Rositas-Dune land-Carsitas have a high susceptibility to wind erosion.

Active Windblown Sand, Dunes, and Sand Transport Corridors

The Chuckwalla Valley of the Mojave Desert, located along I-10 between Blythe and Desert Center, contains several sand transport corridors. This valley supports sand dune habitats that depend upon delivery of fine sand from aeolian (wind-driven) and fluvial (river-driven) processes. These sand dunes have an active layer of mobile sand and exist in a state of dynamic equilibrium as they continuously lose sand downwind and gain sand upwind. Dunes move within sand transport corridors, as wind direction and other factors change. Active sand dunes also provide important habitat for species that rely on regular supply of wind-blown sand (Section 3.5) (BLM 2015a).

The DRECP (BLM 2015a) identifies the entire western portion of the Project Area on BLM-administered land west of Blythe as dune systems and aeolian sand transport corridors. Figure 3.3-8 (Appendix 1) identifies the areas of active windblown sand as Qe and Qe/Qal, which uses aeolian system mapping for data from the DRECP and California Geological Survey mapping, as opposed to the STATSGO data presented in Table 3.3-6, in order to identify specific active areas of windblown sand. However, it is important to note that, because sand transport corridors and sand dunes move over time (Philip Williams & Associates 2011), the figure is approximate. This habitat is of critical importance to several sensitive species (Section 3.5.3.1) and was the primary subject of the Supplemental Environmental Impact Report on Southern California Edison Company's Application for Devers-Palo Verde No. 2 Transmission Line Project Colorado River Substation Expansion (SEIR) (Aspen Environmental Group 2011). The SEIR and its appendices cited studies that found that a row of traffic cones or tamarisk trees would be enough to create a "sand shadow", causing "deflation" (size reduction) of downwind dunes. One study "found that the mean elevation of saltating sand grains … was less than one centimeter off the ground, and more recent research has found that 90 percent of sand transport occurs within 30 centimeters of the ground surface" (PWA 2011). Consequently, sand transport corridors and areas of active windblown sand, such as the one just north of the Colorado River Substation, are sensitive to development.

Based on wind roses for Blythe, dominant winter winds come from the north and northwest, while summer winds are predominantly from the southwest (Muhs et al. 2003). Summer winds are comparatively weak at Blythe (Muhs et al. 2003). Consequently, on an annual basis, transport of sand through the corridor is generally from west to east.

3.4 PALEONTOLOGICAL RESOURCES

3.4.1 Applicable Laws, Regulations, Policies, and Plans

3.4.1.1 Federal

Paleontological Resources Preservation Act. Paleontological resources are any fossilized remains, traces, or imprints of organisms preserved in or on the earth's crust that are of paleontological interest and that provide information about the history of life on earth. Fossils are considered a nonrenewable resource because the organisms they represent no longer exist and, if destroyed, cannot be replaced (BLM 2010a). The Paleontological Resources Preservation Act was enacted in 2009 to establish regulations specific to paleontological resources on Federal lands. In response to the Act, Federal agencies were required to develop plans for managing fossil resources on their lands.

BLM IM 2016-124. This Instruction Memorandum (IM) transmits an update to the BLM's Potential Fossil Yield Classification (PFYC) classification system for surface geology based on the potential that significant paleontological resources occur in a geologic unit. This revision updates the guidance that was introduced in IM 2008-009.

BLM IM 2009-011. This IM provides guidelines for assessing potential impacts to paleontological resources in order to determine mitigation steps for Federal actions on public lands under the FLPMA and NEPA. If it is determined that significant paleontological resources would be adversely affected by a Federal action, the memorandum also provides field survey and monitoring procedures to help minimize impacts.

BLM IM 2008-009. This IM transmits the BLM classification system for paleontological resources on public lands. The PFYC system will be used to classify paleontological resource potential on public lands in order to assess possible resource impacts and mitigation needs for Federal actions involving surface disturbance, land tenure adjustments, and land-use planning. The classification system is based on the potential for the occurrence of significant paleontological resources in a geologic unit, and the associated risk for impacts to the resource based on Federal management actions.

Secretarial Order 3104 (September 28, 1984) grants BLM the authority to issue Archaeological and Paleontological Permits.

3.4.1.2 Local

The City of Blythe General Plan 2025 (2007a) contains specific policies and standards including mitigation, including some for paleontological resources.

3.4.2 Study Area

The study area for paleontological resources is a 2-mile corridor that encompasses the Proposed and Alternative segments.

Occurrences of paleontological resources are related to the geologic formations, and the presence of fossils can be linked to the type and age of mapped geologic units.

As outlined in the BLM Instruction Manual 2016-114, BLM implements a PFYC system for identifying fossil potential on BLM-administered land (BLM 2016f). The classification system is based on the potential for the occurrence of significant paleontological resources in a geologic unit and the associated risk for impacts to the resource based on BLM actions. Using the PFYC system, mapped geologic units are classified as Class 1 (very low) through Class 5 (very high) or as Unknown, based on the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts. A higher class number indicates a higher potential for occurrence. The PFYC system is not intended to be applied to specific paleontological localities or small areas within geologic units (BLM 2014a).

The PFYC Classes are specifically defined as follows:

Class 1 – Very Low. Geologic units that are not likely to contain recognizable paleontological resources.

Class 2 – Low. Geologic units that are not likely to contain paleontological resources.

Class 3 – Moderate. Sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence. Units may contain significant paleontological resources, but these occurrences are widely scattered.

Class 4 – High. Geologic units that are known to contain a high occurrence of paleontological resources. Significant paleontological resources have been documented but may vary in occurrence and predictability. Surface disturbing activities may adversely affect paleontological resources. Rare or uncommon fossils, including nonvertebrate (such as soft body preservation) or unusual plant fossils, may be present.

Class 5 – Very High. Highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant paleontological resources, and that are at risk of human-caused adverse impacts or natural degradation.

Class U – Unknown. Geologic units that cannot receive an informed PFYC assignment. Geological units may exhibit features or preservational conditions that suggest significant paleontological resources could be present, but little information about the actual paleontological resources of the unit or area is known. Geological units represented on a map are based on lithologic character or basis of origin but have not been studied in detail. Area or geologic unit is poorly or under-studied.

Existing PFYC maps and associated geologic unit tables published by the BLM were assembled, reviewed, and used for this analysis. The BLM's DRECP EIS and supporting Paleontological Resources appendix provided PFYC classes and mapping for geologic units across the California portion of the study area (BLM 2014a). The US Department of Energy (DOE) and BLM Programmatic EIS, Designation of Energy Corridors on Federal Land in 11 Western States (DOE/EIS-0386) and supporting PFYC appendix provided PFYC classes for geologic units across the Arizona portion of the study area (DOE and BLM 2007). Further, records from collections maintained by the Natural History Museum of Los Angeles County, San Bernardino County Museum, San Diego Museum of Natural History, and the Arizona Museum of Natural History were obtained (Applied Earthworks 2018).

3.4.3 Existing Conditions

The study area contains middle to late Tertiary sediments dating to 18 Ma, and Quaternary sediments. Approximately 38 percent of the study area contains igneous and metamorphic rocks, which are unlikely to contain fossils (HDR 2017b). The remainder of the study area contains sedimentary units, which, depending on their age, may have the potential to contain fossils. Fossils are not found in sediments less than 10,000 years old (Holocene age—the most recent part of the Quaternary). No previously recorded paleontological localities are located directly within the study area; however, at least six significant fossil localities have been recorded nearby or in geologic units that underlie the study area (Applied Earthworks 2018).

3.4.3.1 Paleontological Potential

Most state statutes prohibit the removal of any paleontological site or feature on public lands and require mitigation of adverse impacts on paleontological resources from developments on public (state) lands (BLM 2010c).

Sedimentary geologic deposits ranging in age from Cambrian through Quaternary have potential to contain significant paleontological resources in the region (BLM 2008c). These units are present at the surface and in the subsurface and were originally deposited as marine, fluvial (river or stream), and/or lacustrine (lake) sediments (BLM 2008c). The geology in the study area generally consists of mid-Paleozoic sedimentary rocks (dating to about 330 Ma) that are locally metamorphosed, in part, where they are intruded by Cretaceous granite.

The types of fossils found in sedimentary units vary depending on their depositional environment and geologic age. Vertebrate fossils are typically found in unconsolidated Quaternary silt, sand, and gravel deposits and Tertiary sedimentary rocks. Various invertebrate marine fossils, including coral, trilobites, brachiopods, cephalopods, and bryozoans, have been found in Cretaceous sedimentary rocks (BLM 2002a). The early Pliocene estuarine Bouse Formation was deposited in an environment where the newly formed Colorado River was freshening the saltwater in the Gulf of California. Sandstones and rocky outcrops in this formation contain an unusual, newly discovered species of barnacle. There is potential for fossil land mammals and marine mammals, as well as important plant and invertebrate habitat and age indicators (BLM 2006).

The Upper Pleistocene Chemehuevi Formation, which was deposited by the Colorado River and extends from Lake Mead south to Yuma, contains the remains of mammoths. Additionally, petrified driftwood, fossils of mammalian herbivores, and a large prehistoric cat have been recovered from locations where the pink silts and sands are exposed along the banks of the Colorado River (BLM 2006).

The geologic units crossed by the Proposed and Alternative segments were reviewed in conjunction with existing BLM PFYC maps to determine which units could potentially contain sensitive paleontological (fossil) resources. These geologic units have been rated relative to their paleontological sensitivity during previous assessments by BLM for other projects in the area using PFYC classes 1 through 5 and U, as defined above.

As shown in Table 3.4-1, based on paleontological data from the DRECP (BLM 2014a) and the Designation of Energy Corridors on Federal Land in 11 Western States Programmatic EIS (DOE and BLM 2007), 8 of the 19 geologic units crossed by the Proposed and Alternative segments have an unknown paleontological sensitivity, 7 have very low paleontological sensitivity, 2 are low, and 2 geologic units have a high paleontological sensitivity.

Table 3.4-1 Paleontological Resource Assessment Summary

FIGURE 3.3-2 (APPENDIX 1) MAP ID	PFYC	PFYC GROUP	DESCRIPTION	AGE
Unconsolidated Geologic Units				
Q	U	Unknown	Quaternary surficial deposits, undivided, consisting of alluvium and terrace deposits	Pliocene to Holocene
Qm	U	Unknown	Surficial deposits consisting of gravel and sand	Middle to Late Pleistocene
Qo	U	Unknown	Surficial deposits consisting of gravel and sand	Late Pliocene to Early Pleistocene
Qr	2	Low	River alluvium consisting of sand and gravel	Holocene
Qy	2	Low	Surficial deposits consisting of sand and gravel	Holocene
Qs	U	Unknown	Extensive marine and nonmarine sand deposits, generally near the coast or desert playas, consisting of dune sand and nonglacial lake or marine sediments	Quaternary
Igneous and Metamorphic Rock Units				
Jg	1	Very Low	Jurassic granitic rocks consisting of granodiorite and granite	Jurassic
Jv	1	Very Low	Jurassic volcanic rocks consisting of rhyolite and felsic metavolcanic rock	Jurassic
Ti	1	Very Low	Middle Miocene to Oligocene shallow intrusions consisting of dacite and rhyolite	Oligocene to Middle Miocene
Tv	1	Very Low	Middle Miocene to Oligocene volcanic rocks consisting of dacite and rhyolite	Oligocene to Middle Miocene
Xg	1	Very Low	Early Proterozoic granitic rocks consisting of granodiorite and granite	Early Proterozoic
Xms	1	Very Low	Early Proterozoic metasedimentary rocks consisting of phyllite and schist	Early Proterozoic

FIGURE 3.3-2 (APPENDIX 1) MAP ID	PFYC	PFYC GROUP	DESCRIPTION	AGE
Yg	1	Very Low	Middle Proterozoic granitic rocks consisting of granite and granodiorite	Middle Proterozoic
Sedimentary Rock Units				
J?	U	Unknown	Jurassic and Triassic Sedimentary and volcanic rocks consisting of rhyolite and sandstone	Triassic and Jurassic
KJs	4	High	Cretaceous to Upper Jurassic sedimentary rocks with minor volcanic rocks consisting of conglomerate and sandstone	Late Jurassic to Cretaceous
Pz	U	Unknown	Paleozoic sedimentary rocks consisting of limestone and sandstone	Paleozoic
Tsm	U	Unknown	Middle Miocene to Oligocene sedimentary rocks consisting of conglomerate and sandstone	Oligocene to Middle Miocene
Tsy	U	Unknown	Pliocene to Middle Miocene deposits consisting of conglomerate and sandstone	Middle Miocene to Pliocene
Qoa	4	High	Marine and non-marine (continental) sedimentary rocks consisting of older alluvium, lake, playa, and terrace deposits	Pleistocene

Notes: PFYC = potential fossil yield classification

Figure 3.4-1 (Appendix 1) shows the fossil potential for geologic units in the study area. Areas with high paleontological sensitivity are shown in red. A Paleontological Identification Report was recently prepared that provides additional data (Applied Earthworks 2018) and is available in the project record.

3.4.3.2 Zone-Specific Conditions

Paleontological resources may occur in sedimentary rocks and unconsolidated sediments greater than 10,000 years old in the study area. Most of the geologic units have a very low to moderate or unknown paleontological sensitivity.

East Plains and Kofa Zone

There is mostly very low to low or unknown paleontological sensitivity in the East Plains and Kofa Zone. A portion of Segment p-06 crosses an area of high paleontological sensitivity (Cretaceous to Upper Jurassic sedimentary rocks with minor volcanic rocks) in the southern Plomosa Mountains.

Quartzsite Zone

There is very low or unknown paleontological sensitivity in Quartzsite Zone.

Copper Bottom Zone

The area of high paleontological sensitivity crossed in this zone consists of Cretaceous to Upper Jurassic sedimentary rocks with minor volcanic rocks that are crossed by Segment p-09 in the Copper Bottom Zone (Appendix 1, Figure 3.4-1).

<u>Colorado River and California Zone</u>

In the Colorado River and California Zone, the area of high paleontological sensitivity consists of Pleistocene marine and nonmarine sedimentary rocks. This geologic unit is crossed by Proposed Segments p-16 and p-18, and Alternative Segments ca-02, ca-06, x-15, and x-16 (Appendix 1, Figure 3.4-1).

3.5 BIOLOGICAL RESOURCES

3.5.1 Applicable Laws, Regulations, Policies, and Plans

The following laws, regulations, and orders are the most relevant to this Project in guiding the conservation and management of biological resources.

3.5.1.1 Federal

Endangered Species Act (ESA; 16 USC 1531–1544). The Federal Endangered Species Act (Federal ESA) establishes a Federal program to conserve, protect, and restore threatened and endangered plants and animals and their habitats. The ESA specifically charges Federal agencies with the responsibility of using their authority to conserve threatened and endangered species. All Federal agencies must ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of an endangered or threatened species or result in the destruction of critical habitat for these species, unless the agency has been granted an exemption. The Secretary of the Interior, using the best available scientific data, determines which species are officially endangered or threatened, and the USFWS maintains the list.

Migratory Bird Treaty Act (16 USC 703–712). The Migratory Bird Treaty Act (MBTA) implements treaties and conventions between the US, Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Unless otherwise permitted by regulations, the MBTA makes it unlawful to pursue, hunt, take, capture, or kill; attempt to take, capture, or kill; possess, offer to sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried, or received any migratory bird, part, nest, egg, or product, manufactured or not.

Bald and Golden Eagle Protection Act of 1940 (16 USC 668–668d), as amended. The Bald and Golden Eagle Protection Act (BGEPA), enacted in 1940 and amended several times since then, prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof."

Responsibilities of Federal Agencies to Protect Migratory Birds, EO 13186, signed 2001, 66 *Federal Register* 3853 (January 17, 2001). This EO creates a more comprehensive strategy for the conservation of migratory birds by the Federal government. The EO provides a specific framework for the Federal government's compliance with its treaty obligations to Canada, Mexico, Russia, and Japan. The EO provides broad guidelines on conservation responsibilities and requires the development of more detailed guidance in Memoranda of Understanding (MOA) within two years of its implementation. It outlines how Federal agencies will promote conservation of migratory birds and requires the support of various conservation planning efforts already in progress; incorporation of bird conservation considerations into agency planning, including NEPA analyses; and reporting annually on the level of take of migratory birds.

Exotic Organisms (EO 11987, May 24, 1977). Under this EO, agencies, to the extent permitted by law, are to:

- Restrict the introduction of exotic species into the natural ecosystems on lands and waters owned or leased by the US;
- Encourage states, local governments, and private citizens to prevent the introduction of exotic species into natural ecosystems of the US;
- Restrict the importation and introduction of exotic species into any natural US ecosystems as a result of activities they undertake, fund, or authorize; and
- Restrict the use of Federal funds, programs, or authorities to export native species for introduction into ecosystems outside the US where they do not occur naturally.

Federal Noxious Weed Act (7 USC 2801 et seq.). This act provides the Secretary of Agriculture authority to designate plants as noxious weeds by regulation and prohibits the movement of all such weeds in interstate or foreign commerce except under permit. The Secretary of Agriculture also has authority to inspect, seize, and destroy products and to quarantine areas, if necessary, to prevent the spread of such weeds.

Invasive Species Control (EO 13112, February 3, 1999). The purpose of this EO is to prevent the introduction of invasive species and provide for their control, as well as to minimize the economic, ecological, and human health impacts that invasive species cause. Agencies whose actions may affect the status of invasive species shall: (1) identify such actions; (2) use relevant programs and authorities to prevent, control, monitor, and research such species; and (3) not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the US or elsewhere.

Plant Protection Act of 2000 (7 USC 7701 et seq.). This Act prevents the importation, exportation, and spread of pests injurious to plants, and provides for pest control and eradication and for the certification of plants.

Fish and Wildlife Conservation Act of 1980 ("Nongame Act"; 16 USC 2901–2911; 94 Stat. 1322), Public Law 96-366, approved September 29, 1980. This Act encourages Federal agencies to use their statutory and administrative authority to conserve and protect nongame fish and wildlife and their habitats. The Act provides funding and technical assistance to states to design conservation plans and programs to benefit nongame species.

Wild Free-Roaming Horses and Burros Act (16 USC 1331–1340). This Act provides for protection of wild, free-roaming horses and burros. It directs the BLM and the USFS of the US Department of Agriculture (USDA) to manage such animals on public lands under their jurisdiction.

Desert Renewable Energy Conservation Plan and Land Use Plan Amendment. The LUPA, prepared to implement the DRECP, is applicable only to BLM-administered land in California, and does not address the Colorado River corridor. The DRECP and LUPA provide a landscape approach to renewable energy and conservation planning in the California Desert that streamlines the process for development of utility-scale renewable energy generation and transmission consistent with Federal and state renewable energy targets and policies, while simultaneously providing for the long-term conservation and management of Special Status Species and vegetation types. In addition to BLM designated sensitive species, the LUPA identifies additional focus species whose conservation and management are provided for in the LUPA.

BLM Manual 6840: Special Status Species Management. This manual provides policy and guidance for conserving species classified as special status species by the BLM. BLM special status species include species listed or proposed for listing under the ESA and species identified by the BLM State Director as requiring special management considerations to promote their conservation and to reduce the likelihood and need for future listing under the ESA.

3.5.1.2 State

<u>Arizona</u>

Arizona Native Plant Law (Arizona Revised Statutes 3-901, et seq.). The Arizona Native Plant Law (ANPL) is administered by the Arizona Department of Agriculture (ADA). This law was enacted to protect rare plants and to protect species from being overharvested. The law designates four protection categories: Highly Safeguarded (HS), SR, Salvage Assessed (SA), and Harvest Restricted (HR). The law requires permitting, inventory, and the opportunity to salvage protected native plant species on state lands. In addition, relocation is required for some protected plants on BLM-administered land and salvage of protected plants is required on private property. On state trust land, the ASLD requires permitting, inventory, and payment for protected plants. The BLM typically requires relocation or salvage of protected species on BLM-administered land, and landowners are required to notify the ADA prior to destruction of protected native plants on their property.

Arizona Revised Statutes, Title 17 – Game and Fish. Title 17 of the Arizona Revised Statutes grants the Arizona Game and Fish Department (AGFD) the responsibilities of managing, preserving, and harvesting wildlife, and enforcing all laws for wildlife protection through the development of policies and programs including the establishment of seasons for hunting, trapping, and fishing, and game limits for all non-tribal lands in Arizona. Accordingly, AGFD manages all wild mammals, birds, reptiles, amphibians, mollusks, crustaceans, and fish as decreed in Arizona Revised Statutes Title 17.

<u>California</u>

California Endangered Species Act (California Fish and Game Code [CFGC] 2050, et seq.). The California Endangered Species Act (California ESA) of 1984 protects California's rare, threatened, and endangered species. CFGC Sections 1900 et seq. designate rare, threatened, and endangered plants under the Native Plant Protection Act of 1977. The applicant must consult with the CDFW regarding the possibility of "take" under the Act, similar to the Federal consultation required under 16 USC 1536. The CDFW can choose to find the Federal biological opinion consistent with state law (a 2080.1 consistency determination), or choose to require a separate state "take" permit (a 2081 permit) if species listed by the Act could be harmed or killed during construction or operation of a project. CDFW is the administering agency.

California Native Plant Protection Act (CNPA) of 1977 (CFGC 1900–1913). This law includes provisions that prohibit the taking of listed rare or endangered plants from the wild. The law also includes a salvage requirement for landowners. Furthermore, it gives the CDFW the authority to designate native plants as endangered or rare and provides specific protection measures for identified populations.

California Fish and Game Code 1600–1603, Streambed Alteration Agreement. This statute regulates activities that would "substantially divert or obstruct the natural flow of, or substantially change the bed, channel, or bank of, or use material from the streambed of a natural watercourse" that supports fish or wildlife resources. A stream is defined as a body of water that flows at least periodically or intermittently through a bed or channel having banks and that supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation. A Streambed Alteration Agreement must be obtained for any proposed project that would result in an adverse impact on a river, stream, or lake. If fish or wildlife would be substantially adversely affected, an agreement to implement mitigation measures identified by the CDFW would be required.

California Fish and Game Code 3511, 4700, 5050, and 5515, Fully Protected Wildlife. These sections define protections of fully protected species of wildlife in California, including the prohibition of the take of fully protected species.

California Fish and Game Code 3500–3516, Protection of Birds. CFGC Sections 3500 to 3502 identify the state's resident game bird species and the actions against those species considered unlawful. Sections 3503, 3503.5, and 3513 protect migratory birds and raptors, in addition to their nests and eggs, from take unless granted explicit authorization by CDFW.

3.5.2 Study Area

The Proposed and Alternative segments would cross land owned or managed by the BLM, USFWS, ASLD, Reclamation, YPG, CRIT land, and private land. Management of the Kofa NWR is directed by the management plan for that refuge (BLM, USFWS, and AGFD 1996). Management of biological resources on BLM-administered land is directed by the current RMP or Conservation Plan for each of the BLM Planning Areas as listed below (from east to west):

- Lower Sonoran, Arizona (BLM 2012a)
- Yuma, Arizona (BLM 2010b)
- Bradshaw Harquahala, Arizona (BLM 2010c)
- Lake Havasu, Arizona (BLM 2007)
- California Desert Conservation Plan (BLM 1980)
- Northern and Eastern Colorado Desert Coordinated Management Plan (BLM 2002b)
- DRECP (BLM 2016a) and applicable Conservation and Management Actions from the DRECP

The biological study area includes a corridor 2 miles to each side of the Proposed and Alternative segments (a 4-mile wide corridor). This biological study area was selected to identify biological resources that could be directly affected by the transmission line (for example, by ground disturbance and the presence of workers) or that could be indirectly affected by noise or other stressors. The Project Area is an area where direct impacts may occur and includes a 200-foot wide corridor based on the centerline of route segments, and other locations where ground disturbance may occur due to access roads, staging, or other Project activities. Analysis of biological resources within the Project Area allows some flexibility for Project routing and design. The biological study area also encompasses 200-feet on either side of the alternative SCS 12kV distribution line.

The analysis of potential Project-related impacts to biological resources was based on information obtained from applicable reports and databases, a field reconnaissance survey, rare plant surveys in California, and information provided by staff of the BLM, AGFD, and CDFW (HDR 2017c).

3.5.3 Existing Conditions

3.5.3.1 Vegetation Resources, Including Special Status Plants, and Noxious and Invasive Weeds

Introduction

The Project Area is in the northern part of the Sonoran Biogeographical Province (Brown et al. 1988; Lowe and Brown 1994; Weinstein et al. 2003). Vegetation typical of the Sonoran Desert is present there from about 100 to 4,000 feet in elevation (Lowe 1964; Turner and Brown 1994).

The Sonoran Desert has a bimodal rainfall pattern, with rain from frontal systems occurring in the late fall and winter, and convection systems causing thunderstorms during the summer. Average annual rainfall across the Project Area is generally less than 5 inches. Average monthly temperatures range from a low of about 52 °F in December and January to a high of 93°F in July and August (ADWR 2009).

Terrain in southwestern Arizona and southeastern California is characterized by northwest-to-southeast-oriented mountain ranges separated by large valleys, as is typical for the Basin and Range physiographic province. In and near the Project Area, mountain ranges generally are lower than 3,700 feet in elevation, and elevations in the valley bottoms range from about 300 to 1,200 feet, decreasing from east to west. Mountains in the region are steep, and most are of volcanic origin. Terrain in the part of the Project Area in California is flat, soils generally are deep and sandy (Marshall et al. 2000; Weinstein et al. 2003), and elevations range from about 250 to 2,500 feet.

Numerous classification systems and maps have been developed to describe the distribution and composition of the biotic communities in the southwestern US. One of the most commonly referenced reports, *Biotic Communities: Southwestern United States and Northwestern Mexico* (Brown 1994), is used here to describe the general pattern of vegetation in the Project Area. The Southwest Regional Gap Analysis (ReGAP) program (Lowry et al. 2005; USGS National Gap Analysis Program 2004) has developed fine-scale maps of land cover types in Arizona and other southwestern states. These maps were used to quantitatively describe the vegetation associations and other land cover types along the Proposed and Alternative segments in Arizona (Appendix 1, Figure 3.5-1).

Other relevant maps and classifications of vegetation in southwestern Arizona considered in this discussion include the following:

- Major Land Resource Areas as classified by the NRCS (2005) and described in the YFO RMP (BLM 2008c, Section 3.3)
- A map and description of vegetation associations and natural community conservation elements of the Kofa NWR and surrounding region (Weinstein et al. 2003, Appendix 1, Figure ES-1)
- A land cover classification system and map of the planning area for the Lower Colorado River Multi-Species Conservation Program (LCRMSCP 2004)

To describe patterns of vegetation distribution along Proposed and Alternative segments in California, a fine-scale map of vegetation alliances in portions of the Mojave and Sonoran deserts was used (Menke et al. 2013) (Appendix 1, Figure 3.5-2). This map was developed for the BLM DRECP (BLM 2015a) with support from the CDFW and was obtained from the CDFW's Biogeographic Information and Observation System (CDFW 2016a). The map was developed using the statewide system established to classify patterns of vegetation associations (Sawyer et al. 2009).

Vegetation Communities and Habitat Features

The entire Project Area is included within two subdivisions of the Sonoran Desert: Lower Colorado River Valley and Arizona Uplands, represented by various plant associations and habitat types (including physical features). The description of vegetation is taken primarily from Turner and Brown (1994), Marshall et al. (2000), Weinstein et al. (2003), and BLM (2002c, 2008c). Certain vegetative and physical features of habitats have been identified in land use plans (BLM 2002c, 2010a, 2010b, 2012b) and other documents (BLM, USFWS, and AGFD 1996; Weinstein et al. 2003) as important for the conservation of biodiversity in the region.

The Proposed and Alternative Segments do not cross any BLM-designated Vegetation Habitat Management Areas or Areas of Critical Environmental Concern (ACECs) identified in an RMP (BLM 2010b, Figure 2-5; BLM 2010c; BLM 2012a; BLM 2007).

For California, the CDFW has assigned state-level rarity rankings to many vegetation alliances that are dominated by native species (CDFW 2010). The DRECP classifies vegetation alliances (an alliance is defined by one or a group of diagnostic plant species) on BLM land with a state ranking of S1, S2, or S3 (critically imperiled, imperiled, and vulnerable, respectively) as rare vegetation alliances, and provides protection measures in the LUPA. CDFW rankings and DRECP classification of vegetation alliances show three rare plant alliances on the Palo Verde Mesa that are crossed by one or more route segments (Figure 3.5-3, Table 3.5-1): *Pleuraphis rigida* (big galleta) Alliance (S2, imperiled); *Prosopis glandulosa* (honey mesquite) Alliance (S3, vulnerable); and *Pluchea sericea* (arrowweed) Alliance (S3, vulnerable). The *Prosopis glandulosa* (honey mesquite) Alliance, *Pluchea sericea* (arrowweed) Alliance, *Parkinsonia florida–Olneya tesota* (blue paloverde-ironwood) Alliance (S3, vulnerable but not rare), and *Suaeda moquinii* (bush seepwood) Alliance (S3, vulnerable but not rare) are also crossed by one or more route segments and are included in the semi-desert wash woodland riparian vegetation type, often referred to as microphyll woodlands. These rare vegetation alliances and dry desert wash woodland communities are considered sensitive in the California BLM planning area (BLM 2015a).

Table 3.5-1 Rare Vegetation Alliances on the Palo Verde Mesa Intersected by Project Segments

RARE VEGETATION ALLIANCE	SEGMENT	MILES OF ALLIANCE INTERSECTED
Pleuraphis rigida Alliance (big galleta)	ca-02	<0.1
	ca-06	0.1
	ca-07	0.3
	x-15	0.1
	x-16	0.7
Pluchea sericea Alliance (arrowweed)	ca-06	0.1
Prosopis glandulosa Alliance (honey mesquite)	ca-02	<0.1
	ca-06	<0.1
	p-16	0.1

Lower Colorado River Valley Subdivision of the Sonoran Desert

The Lower Colorado River Valley subdivision occurs at low elevations in the valley bottoms and on lower slopes along all route segments in Arizona and California. Most of this area is vegetated with sparse stands of creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*), often with large areas of unvegetated desert pavement. Cacti, such as desert Christmas cactus (*Opuntia leptocaulis*), prickly pear (*Opuntia* spp.), saguaro (*Carnegiea gigantea*), and barrel cactus (*Ferocactus* spp.), are common in some areas. The creosote bush–white bursage vegetation series is the common vegetation series throughout most of the Project Area, including in the Harquahala Plain, Ranegras Plain, La Posa Plain, and Palo Verde Mesa in California. In addition, parts of some valley bottoms in the eastern part of the Project Area are (or were prior to conversion for agriculture) dominated by saltbush (*Atriplex* spp.).

Bush seepweed (*Suaeda moquinii* = *S. nigra*) is a subshrub and grows in many types of desertscrub habitats, generally with saline and alkaline substrates such as desert flats, playas, and seeps.

Arizona Upland Subdivision of the Sonoran Desert

The Arizona Upland subdivision occurs on upper slopes of valleys and dissected, rocky plains, primarily in the central portion of the Project Area in Arizona where the route segments cross or are adjacent to mountain ranges. The diversity and abundance of vegetation are greater in this subdivision than in the Lower Colorado River Valley subdivision. The common vegetation series in this subdivision in the Project Area is the paloverde-cacti-mixed scrub series. Dominant species include foothill paloverde (*Parkinsonia microphylla*) and triangleleaf bursage (*Ambrosia deltoidea*) in addition to creosote bush, white bursage, and numerous cacti, including saguaro. Vegetation typical of this subdivision of the Sonoran Desert is found in the Project Area in the foothills and slopes of the Eagletail, New Water, and Dome Rock mountains.

Riparian vegetation
The only permanent water and associated riparian vegetation in the biological study area is along the Colorado River and in canals and drains adjacent to irrigated fields in California. South of Blythe, the Colorado River is channelized in most places, and riparian vegetation is restricted to the immediate banks of the river. However, in some places, including along proposed crossings of the river, riparian vegetation in the floodplain extends up to 0.7 mile from the river. The dominant vegetation in the riparian area within the floodplain is salt cedar (*Tamarix* spp.; a non-native invasive species), honey mesquite (*Prosopis glandulosa*), screwbean mesquite (*Prosopis pubescens*), and saltbush. Stands of arrowweed (*Pluchea sericeaare*) are found along the river corridor and in association with canals and drains in the agricultural areas. There are some small stands of cottonwood (*Populus fremontii*) and willow (*Salix gooddingii*) along the section of the river south of Blythe (LCRMSCP 2004).

Riparian vegetation and associated aquatic areas, especially riparian habitat with native vegetation, have a high diversity of plants and animals. Numerous species found in the region, including many special status species, are riparian obligates. The BLM estimates that more than 400 species in the region either are directly dependent on riparian habitats or use them more than other habitats (BLM 2010c, Section 3.4.2).

Braided channel floodplains and valley desert wash woodlands
Ephemeral drainage channels (i.e., xeroriparian washes, referred to as microphyll woodlands and desert dry wash woodlands in some BLM [2002c, 2016g] land use plans) in both the Lower Colorado River Valley and Arizona Upland subdivisions generally have a greater diversity, abundance, and stature of vegetation than do the surrounding uplands, and are used by wildlife for nesting, foraging, resting and thermal cover, and as travel corridors. Numerous trees, shrubs, and grasses, including ironwood (*Olneya tesota*), blue paloverde (*Parkinsonia florida*), mesquite (*Prosopis* spp.), big galleta (*Pleuraphis rigida*), wolfberry (*Lycium* spp.), and graythorn (*Ziziphus obtusifolia*) are common in these washes. In valley bottoms, some wash channels are braided or have areas where sheet and stream flow support large stands of vegetation.

Some floodplains and lower-elevation washes, such as Bouse Wash in the Ranegras Plain, have dense stands of vegetation not found in the surrounding area. Weinstein et al. (2003, Figure ES-1) mapped large washes in the region that exhibit valley xeroriparian scrub, mountain xeroriparian scrub, and braided channel floodplains.

Sand dunes
As discussed in Section 3.3.3.6 Colorado River and California Zone – Soils, the Colorado River Substation and the routes that approach the substation are in or near a series of sand sheets and dunes. This sand dune system is in a state of dynamic equilibrium and relies on aeolian transport of sand into the area from upwind sources and free movement of sand through the dunes. The Project Area is at the eastern end of the approximately 30-mile-long Chuckwalla sand transport corridor, which trends west to east (ESA PWA 2011; Muhs et al. 2003). Based on the surficial geology mapping prepared by the California Geological Survey (Lancaster 2014) (Appendix 1, Figure 3.3-8), the large dune system west of the Colorado River Substation diminishes east of the substation to a band of sand sheets about 1-mile-wide extending an additional 5 miles across the Palo Verde Mesa where the sand transport corridor ends. A 2017 study (Kenney) found that the primary source of aeolian sand deposits on Palo Verde Mesa are the Wiley's Well Basin and Mule Mountains—a local source rather than from a regional sand migration corridor. The DRECP

classifies most of the Palo Verde Mesa as Sand and Dune System (Appendix 1, Figure 3.3-8) where there is a dynamic mosaic of active dunes (dunes that have a layer of mobile fine sand), with areas of partially stabilized and stabilized sand sheets composed of increasingly coarse and compacted sand due to loss of fine sand. Recent research has posited that over the last several thousand years the dune system has become increasingly stable and in places, degrading (Kenney 2017). Dune vegetation can strongly influence sand transport by providing surface and subsurface roughness that helps to stabilize dunes. The dominant vegetation in these sand dunes includes creosote bush, white bursage, brittlebush (*Encelia farinosa*), white ratany (*Krameria grayi*), cheesebush (*Hymenoclea salsola*), big galleta, and birdcage evening primrose (*Oenothera deltoides*) (CPUC 2011, Section D.2.1 and Figure D-2; HDR 2017c). Sahara mustard is a persistent, dominant non-native invasive weed. Numerous rare plants and animals, such as the plant Harwood's eriastrum (*Eriastrum hardwoodii*) and the Mojave fringe-toed lizard (*Uma scoparia*), are found on sand dunes.

Springs and other watering sites

Numerous wildlife species depend on maintained or natural water sources during dry periods, and vegetation is often more abundant and diverse along the outflows of springs. Figure 3.5-4 (Appendix 1) shows the location of wildlife waters in Arizona within the biological study area that are inventoried by the AGFD (2016a). Table 3.5-2 lists the approximate distance from the route segments to wildlife waters that are within the 4-mile-wide (2 miles to each side of the corridor) biological study area. No wildlife waters are within the biological study area in California.

Table 3.5-2 Wildlife Waters in Arizona Within Two Miles of Route Segments

SEGMENT	WILDLIFE WATER IDENTIFICATION	DISTANCE (MILES)
East Plains and Kofa Zone		
d-01	Courthouse Butte	1.9
i-03	Gravel Pit	1.9
i-04	Ibex Peak/Ram Pasture	1.9
in-01	Ibex Peak/Ram Pasture	1.5
p-01	Big Horn Mountains #5	0.1
p-01	Big Horn Peaks #1	1.6
p-06	Charco 4	1.2
p-06	New Water Well	0.6
p-06	Charco 3	1.0
p-06	Scott Well	0.7
p-06	Twelve Mile Well	0.3
Quartzsite Zone		
p-09	Tule Tank	1.3
Copper Bottom Zone		
cb-01	Dome Rock	0.6
cb-01	Tule Tank	0.7

SEGMENT	WILDLIFE WATER IDENTIFICATION	DISTANCE (MILES)
cb-01	Dome Rock Mountain #1	1.5
cb-02	Dome Rock	0.3
cb-02	Dome Rock Mountain #1	1.1
cb-02	Tule Tank	1.6
cb-03	Dome Rock Mountain #1	0.1
cb-03	Dome Rock	1.0
cb-03	Tule Tank	1.6
cb-04	Dome Rock	0.7
cb-04	Dome Rock Mountain #1	1.6
p-10	Tule Tank	1.2
p-10	Dome Rock Mountain #1	1.6
p-10	Dome Rock	1.7
p-11	Dome Rock Mountain #1	0.1
p-11	Dome Rock	0.8
p-11	Tule Tank	1.6

Source: AGFD (2016a)

Steep slopes, rock outcrops, and cliffs
Steep mountain slopes are important habitat for desert bighorn sheep (*Ovis canadensis mexicana*), and cliffs provide nesting sites for numerous raptor species. These features are found throughout mountain ranges in and surrounding the Project Area.

Caves and abandoned mines
Cave and abandoned mine features are important for various species of bats in southwestern Arizona and are used for shelter by other wildlife. Abandoned mines, and possibly caves, exist throughout the mountainous areas in the Project Area.

<u>Special Status Plant Species</u>

The special status species considered include the following categories of plants:

- Plant species classified as proposed, threatened, or endangered under the Federal ESA;
- The most recent list of sensitive plant species as classified by the California BLM in accordance with BLM Manual 6840, Special Status Species Management (BLM 2010d, 2010e, 2015b);
- The most recent list of sensitive plant species as classified by the Arizona BLM in accordance with BLM Manual 6840, Special Status Species Management (BLM 2010d, 2010e, 2015b);
- Plants protected under the Arizona Native Plant Law;
- Endangered, threatened, or rare plant species as classified under the California ESA (CDFW 2016b, 2016c);

- Plants classified as rare under the California Native Plant Protection Act (CNPS 2016);
- Special status species as classified by the BLM and identified in RMPs (BLM 2002c, Table 3-5; BLM 2010e; BLM 2015a, Table III.7-33; BLM 2015b);
- Plants listed by the CNPS (2016) as having a California Rare Plant Rank of:
- 1A – presumed extirpated in California (classified as special status by BLM)
- 1B – rare, threatened, or endangered in California and elsewhere (classified as special status by BLM)
- 2A – presumed extirpated in California but common elsewhere
- 2B – rare, threatened, or endangered in California but more common elsewhere

ESA Threatened, Endangered, and Proposed Plant Species
No plant species currently listed or proposed for listing under the ESA have been documented or would be expected to be present in the Project Area.

Other Special Status Plant Species – Arizona
The ADA maintains a list of plants protected under the Arizona Native Plant Law. That list includes four categories of protected plants: HS, SR, SA, and HR. Highly Safeguarded plants include rare species; many of the species under other classifications are widespread throughout the Project Area.

Seven plants classified as sensitive by the BLM are present in the BLM Yuma Planning Area and elsewhere in southwestern Arizona. Four of those species—blue sand lily (*Triteliopsis palmeri*), sand food (*Pholisma sonorae*), scaly sandplant (*Pholisma arenarium*), and Schott wire lettuce (*Stephanomeria schottii*) —are restricted to sand dunes and other areas with very sandy soils, which are not present in the Project Area in Arizona; the latter three of those plants are classified as HS under the Arizona Native Plant Law. A fifth species, Kearney sumac (*Rhus kearneyi spp. kearneyi*), is present only to the south of the Project Area. Two other species, Parish wild onion (*Allium parishii*) and Kofa Mountain barberry (*Berberis harrisoniana*), have been found on rocky or steep slopes and canyons in the Kofa Mountains, and it is possible but unlikely that they are present north of there in or near the Project Area (AGFD Natural Heritage Program n.d.; BLM 2008c; Kearney and Peebles 1960; Munz 1974). Table 3.5-3 lists plants protected under the Arizona Native Plant Law and Arizona BLM Sensitive plants and their potential to be present in the Project Area.

Table 3.5-3 Arizona Protected and BLM Sensitive Plant Species and Potential Presence in the Project Area

COMMON NAME	SCIENTIFIC NAME[A]	STATUS[B]	POTENTIAL PRESENCE IN PROJECT AREA
Ajo lily	*Hesperocallis undulate*	ANPL-SR	Likely
Barrel cactus	*Ferocactus wislizeni*	ANPL-SR	Likely
Beavertail cactus	*Opuntia basilaris var. basilaris*	ANPL-SR	Likely
Beehive cactus	*Echinomastus johnsonii*	ANPL-SR	Likely
Bigelow's nolina	*Nolina bigelovii*	ANPL-SR, HR	Likely

COMMON NAME	SCIENTIFIC NAME[A]	STATUS[B]	POTENTIAL PRESENCE IN PROJECT AREA
Blue paloverde	*Parkinsonia florida*	ANPL-SA	Likely
Blue sand lily	*Triteliopsis palmeri*	ANPL-SR BLM Sensitive	Not expected
Buckhorn cholla	*Cylindropuntia acanthocarpa var. acanthocarpa*	ANPL-SR	Likely
Crucifixion thorn	*Castella emoryi*	ANPL-SR	Likely
Desert agave	*Agave deserti spp. simplex*	ANPL-SR	Likely
Desert holly	*Atriplex hymenelytra*	ANPL-SR	Likely
Desert willow	*Chilopsis linearis*	ANPL-SA	Likely
Devil's cholla	*Cylindropuntia kunzei*	ANPL-SR	Likely
Diamond cholla	*Cylindropuntia ramosissima*	ANPL-SR	Likely
Dudleya	*Dudleya arizonica*	ANPL-SR	Likely
Elephant tree, torote	*Bursera microphylla*	ANPL-SR	Likely
Foothill paloverde	*Parkinsonia microphylla*	ANPL-SA	Likely
Hedgehog cactus	*Echinocereus engelmanii var. chrysocentrus*	ANPL-SR	Likely
Ironwood	*Olneya tesota*	ANPL-SA, HR	Likely
Kearney sumac	*Rhus kearneyi spp. kearneyi*	ANPL-SR BLM Sensitive	Not expected
Kofa mountain barberry	*Berberis harrisoniana*	BLM Sensitive	Unlikely
Parish wild onion	*Allium parishii*	BLM Sensitive	Unlikely
Pincushion cactus	*Mammillaria tetrancistra*	ANPL-SR	Likely
Mesquite	*Prosopis spp.*	ANPL-SA, HR	Likely
Night blooming cereus	*Peniocereus greggii*	ANPL-SR	Likely
Ocotillo	*Fouquieria splendens*	ANPL-SR	Likely
Parish wild onion	*Allium parishii*	ANPL-SR	Likely
Pencil cholla	*Cylindropuntia leptocaulis*	ANPL-SR	Likely
Queen-of-the-night	*Peniocereus greggii var. transmontanus*	ANPL-SR	Likely
Saguaro cactus	*Carnegiea gigantea*	ANPL-SR	Likely
Saguaro cactus 'crested'	*Carnegia gigantea*	ANPL-HS	Likely
Sand food	*Pholisma sonorae*	ANPL-HS BLM Sensitive	Not expected
Scaly sandplant	*Pholisma arenarium*	ANPL-HS BLM Sensitive	Not expected
Schott wire lettuce	*Stephanomeria schottii*	BLM Sensitive	Not expected
Silver cholla	*Cylindropuntia echinocarpa*	ANPL-SR	Likely
Smoke tree	*Psorothamnus spinosus*	ANPL-SA	Likely
Teddy-bear cholla	*Cylindropuntia bigelovii*	ANPL-SR	Likely

[A] Additional cacti and yucca protected under the Arizona Native Plant Law could be present in the biological study area.
[B] Arizona Native Plant Law (ANPL) status: HS = Highly Safeguarded, SR = Salvage Restricted, SA = Salvage Assessed, HR = Harvest Restricted

BLM (2006, Table 3-4), BLM (2008d, Appendix U), BLM (2010a, Table E-4), BLM (2011c, Table J-1)

Ten plant species are classified as priority species in the BLM Yuma Planning Area (Table 3.5-4) (BLM 2008c). Many of these species, such as big galleta, catclaw acacia, cottonwood, and Gooding's willow, are common in suitable habitat and are indicators of rangeland and riparian conditions. Of the other less-common priority plant species, only one—long leaf sandpaper plant—might be found in the Project Area on steep slopes, canyons, and washes on or near the Kofa NWR. Table 3.5-4 lists Arizona BLM Yuma Planning Area priority plant species and the likelihood that they may be found in or near the Project Area. The majority of the route segments in Arizona are in the BLM Yuma Planning Area.

Table 3.5-4 BLM Yuma Field Office Priority Plant Species and Potential Presence in the Project Area in Arizona

COMMON NAME	SCIENTIFIC NAME	POTENTIAL PRESENCE IN PROJECT AREA
Alverson's foxtail cactus	*Coryphantha alversonii*	Not expected
Big galleta	*Pleuraphis (Hilaria) rigida*	Present
Bush muhly	*Muhlenbergia porteri*	Present
Catclaw acacia	*Acacia greggii*	Present
Cottonwood	*Populus fremontii*	Present
Dune buckwheat	*Eriogonum deserticola*	Not expected
Dune spurge	*Euphorbia platysperma*	Unlikely
Long leaf sandpaper plant	*Petalonyx linearis*	Not expected
Scrub oak	*Quercus turbinella*	Present
Goodding's willow	*Salix gooddingii*	Present

Sources: BLM (2006, Table 3-4), BLM (2008d, Appendix U), BLM (2010a, Table E-4), BLM (2011c, Table J-1)

Other Special Status Plant Species – California

In addition to California BLM designated sensitive plant species (BLM 2015b), the BLM confers sensitive status on California state endangered, threatened, and candidate species, and rare plant species with a California Rare Plant Rank of 1B (rare, threatened, or endangered in California and elsewhere) that are on BLM-administered land or affected by BLM actions (LUPA).

Numerous evaluations of and surveys for special status plant species have been conducted for renewable energy projects and transmission lines proposed to be developed on Palo Verde Mesa within and near the Project Area (BLM 2012b, 2014b; BLM and Riverside County Planning Department 2015; BLM and CPUC 2006; CPUC 2011). Based on those reviews and surveys, searches of the CDFW's Biogeographic Information and Observation System and Natural Diversity Database (CDFW 2016a), review of the CNPS's online inventory (CNPS 2016), and 2016 and 2017 surveys of the Proposed Action route (HDR 2016a, Transcon Environmental 2017), 16 special status plant species (Table 3.5-5) have been found or could be present. None of those species are classified as endangered, threatened, or rare by the California Fish and Game Commission (CDFW 2016b).

Table 3.5-5 Special Status Plant Species That Could Occur Within or Near the Biological Study Area in California

SPECIES		STATUS (CALIFORNIA/BLM)	HABITAT	POTENTIAL PRESENCE IN PROJECT AREA
Euphorbia abramsiana	Abrams' spurge	CRPR: 2B.2	Sandy soils in Mojave desertscrub and Sonoran desertscrub from 5 to 915 meters (15 to 3,000 feet) above mean sea level (MSL). Annual herb. Blooms September to November. Has been found north of Interstate 10 near McCoy Mountains (BLM 2012b) and could occur within or near biological study area in creosote bush association with sandy soil.	Likely
Hymenoxys odorata	Bitter hymenoxys	CRPR: 2B.1	Occurs in sandy soils in riparian scrub and Sonoran desertscrub from 45 to 150 meters (147 to 492 feet) above MSL. Annual herb. Blooms February to November. Low potential to occur along Colorado River and in woodland washes within study area.	Unlikely
Ditaxis serrata var. californica	California ditaxis	CRPR: 3.2	Occurs in Sonoran desertscrub from 30 to 1,000 meters (98 to 3,280 feet) above MSL. Perennial herb. Blooms March to December. Has been found north of Interstate 10 near McCoy Mountains (BLM 2012b) and likely is uncommon or absent on sandy soil in study area.	Unlikely
Proboscidea althaeifolia	Desert unicorn-plant	CRPR: 4.3	Occurs primarily in sandy soils of Sonoran desertscrub from 85 to 1,000 meters (278 to 3,280 feet) above MSL. Perennial herb. Blooms May to October. Has been found within study area (BLM 2012b; BLM and Riverside County Planning Department 2015).	Present

SPECIES		STATUS (CALIFORNIA/BLM)	HABITAT	POTENTIAL PRESENCE IN PROJECT AREA
Teucrium cubense ssp. depressum	Dwarf germander	CRPR: 2B.2	Occurs in Desert dunes, playa margins and Sonoran desertscrub from 45 to 400 meters (147 to 1,312 feet) above MSL. Annual herb. Blooms March to November. Has not been found in or near study area, but could occur on sandy soils there and in surrounding region.	Likely
Euphorbia platysperma	Flat-seeded spurge	CRPR: 1B.2 BLM: Sensitive	Sonoran desertscrub habitats with sandy soils and dunes below 200 meters (660 feet) above MSL. Could occur on sandy soils within or near study area, but has not been found there.	Likely
Ditaxis claryana	Glandular ditaxis	CRPR: 2B.2	Perennial herb that prefers low-elevation sandy soils in Mojave and Sonoran desert creosote scrub habitats in southern California below 100 meters (328 feet) above MSL. Could occur within or near study area, but has not been found there.	Likely
Astragalus sabulonum	Gravel milkvetch	CRPR: 2B.2	Occurs in desert dunes and Mojave/Sonoran desertscrub from –53 to 910 meters (–173 to 2,985 feet) above MSL. Annual herb. Blooms February to July. Could occur within or near study area, but has not been found there.	Likely
Eriastrum harwoodii	Harwood's eriastrum	CRPR: 1B.2 BLM: Sensitive	Occurs in Desert dunes from 125 to 915 meters (410 to 3,001 feet) above MSL. Annual herb. Blooms March to June. This species has been found on stabilized dunes and other sandy soils in the biological study area (BLM 2012b; BLM and Riverside County Planning Department 2015; Transcon Environmental 2017).	Present

SPECIES		STATUS (CALIFORNIA/BLM)	HABITAT	POTENTIAL PRESENCE IN PROJECT AREA
Astragalus insularis var. harwoodii	Harwood's milkvetch	CRPR: 2B.2	Occurs in sandy or gravelly soils along desert dunes and Mojave desertscrub below 710 meters (2,329 feet) above MSL. Annual herb. Blooms January to May. This species has been found in the biological study area (BLM and Riverside County Planning Department 2015; Transcon Environmental 2017).	Present
Colubrina californica	Las Animas colubrina	CRPR: 2B.3	Perennial deciduous shrub found in Mojave and Sonoran desertscrub and Joshua Tree woodland. Preferred habitat includes sandy, gravelly soils and dry canyons from 10 to 1,000 meters (32 to 3,280 feet) above MSL. Blooms April to June. Has been found north of Interstate 10 near McCoy Mountains but not within study area (BLM 2012b; BLM 2014b). Unlikely to occur in sandy soil within study area.	Unlikely
Calliandra eriophylla	Pink fairy-duster	CRPR: 2B.3	Perennial deciduous shrub associated with dry wash woodlands in the Sonoran desert from 120 to 1,500 meters (393 to 4,921 feet) above MSL. Blooms January to March. Low potential to occur in desert woodlands within study area.	Unlikely
Cryptantha costata	Ribbed cryptantha	CRPR: 4.3	Occurs in sandy soils in desert dunes and Mojave/Sonoran desertscrub from –60 to 500 meters (–196 to 1,640 feet) above MSL. Annual herb. Blooms February to May. This species has been found in the biological study area (BLM 2012b, 2014b; BLM and Riverside County Planning Department 2015).	Present

SPECIES		STATUS (CALIFORNIA/BLM)	HABITAT	POTENTIAL PRESENCE IN PROJECT AREA
Carnegiea gigantea	Saguaro	CRPR: 2B.2	Large perennial succulent and signature species of Sonoran desertscrub. Known to prefer gravelly slopes and rocky soils on mountains or bajadas. Blooms May to June. Could occur in desert woodlands and upper slopes surrounding study area.	Likely
Funastrum utahense	Utah vine milkweed	CRPR: 4.2	Occurs in sandy or gravelly soil in Mojave/Sonoran desertscrub from 100 to 1,435 meters (328 to 4,708 feet) above MSL. Perennial herb. Blooms March to October. Has been found north of Interstate 10 near McCoy Mountains but not within study area (BLM 2012b).	Likely
Cryptantha holoptera	Winged cryptantha	CRPR: 4.3	Annual herb that occurs in Mojave desert/Sonoran desertscrub from 100 to 1,690 meters (328 to 5,544 feet) above MSL. Blooms March to April. This species has been observed in the study area (BLM 2014b).	Present

Notes: CRPR = California Rare Plant Ranking
MSL = mean sea level
List 1A = Plants presumed extirpated in California and either rare or extinct elsewhere
List 1B = Plants rare, threatened, or endangered in California and elsewhere
List 2A = Plants presumed extirpated in California, but common elsewhere
List 2B = Plants rare, threatened, or endangered in California, but more common elsewhere
List 3 = Plants about which more information is needed – a review list
List 4 = Plants of limited distribution – a watch list
0.1 Seriously endangered in California
0.2 Fairly endangered in California
0.3 Not very endangered in California

Noxious and Invasive Weeds

Invasive annual and perennial plant species have become widespread throughout the Sonoran Desert and are common in some parts of the biological study area. Common invasive plants found in the area include Mediterranean grass (*Schismus* spp.), cheatgrass (*Bromus tectorum*), buffelgrass (*Pennisetum ciliare*), red brome (*Bromus madritensis* spp. *rubens*), fountain grass (*Pennisetum alopecuroides*), wild oat (*Avena fatua*), prickly Russian thistle (*Salsola tragus*), and Sahara mustard (*Brassica tournefortii*) (BLM 2002c, 2006, 2008c; Weinstein et al. 2003; YPG 2017). Weeds are most common in and near agricultural areas at the eastern and western ends of the Project Area and along route segments near I-10.

BLM's Land Use Plan Amendments (BLM 2002c and 2008c) have identified salt cedar as a pernicious and widespread invasive species in riparian areas. This nonnative tree is the dominant riparian plant species where route segments would cross the Colorado River.

The ADA (2005) and the California Department of Food and Agriculture (2016) maintain lists of noxious weeds in those states. The ADA further classifies noxious weeds as prohibited, regulated, or restricted. Prohibited weeds are those that are prohibited being brought into the state. Restricted weeds are identified plant species, including viable plant parts, found in Arizona that must be quarantined to prevent further infestation or contamination. Regulated weeds are identified plant species, including viable plant parts, found in Arizona that might need to be controlled to prevent further infestation or contamination. In addition, as directed by the Plant Protection Act of 2000, the USDA (2016) maintains a list of noxious weeds. Table 3.5-6 identifies the 14 species on those lists that are known to be present in the BLM planning areas that are crossed by route segments.

Table 3.5-6 Federal and State-regulated Noxious Weeds Found in or Near the Biological Study Area

SCIENTIFIC NAME	COMMON NAME	FEDERAL DESIGNATION	CALIFORNIA DESIGNATION	ARIZONA DESIGNATION
Acroptilon repens	Russian knapweed	-	Noxious	Prohibited; Restricted
Alhagi maurorum	Camelthorn	-	Noxious	Prohibited; Restricted
Arundo donax	Giant-reed	-	Noxious	-
Carduus nutan	Musk thistle	-	Noxious	-
Centaurea diffusa	Diffuse knapweed	-	Noxious	Prohibited; Restricted
Centaurea solstitialis	Yellow star thistle	-	Noxious	Prohibited; Restricted
Cuscuta spp.	Dodder	-	Noxious	Prohibited; Restricted
Eichhornia crassipes	Water hyacinth	-	-	Prohibited; Restricted

SCIENTIFIC NAME	COMMON NAME	FEDERAL DESIGNATION	CALIFORNIA DESIGNATION	ARIZONA DESIGNATION
Halogeton glomeratus	Halogeton	-	Noxious	Prohibited; Restricted
Hydrilla verticaillata	Hydrilla	-	Noxious	Prohibited
Onopordum acanthium	Scotch thistle	-	Noxious	Prohibited; Restricted
Salvinia molesta	Giant salvinia	Noxious	-	Prohibited
Salsola tragus	Prickly Russian thistle	-	Noxious	-
Tamarix spp.	Saltcedar	-	Noxious	-
Tribulus terrestris	Puncturevine	-	Noxious	Prohibited; Regulated

Sources: ADA (2005); BLM (2006, Tables J-8 and J-9); BLM (2008c, Table 5); California Department of Food and Agriculture (2016); USDA (2016)

Zone-Specific Conditions

The following subsections describe in detail the vegetation associations and other land cover types, as well as other important features, along the route segments in the four zones, based on fine-scale maps of vegetation in Arizona (Lowry et al. 2005; USGS National Gap Analysis Program 2004) and California (Menke et al. 2013).

East Plains and Kofa Zone

Table 3.5-7 provides the vegetation types crossed by the Proposed and Alternative Segments in the East Plains and Kofa Zone.

Table 3.5-7 Land Cover Types by Segment in the East Plains and Kofa Zone

SEGMENT	AGRICULTURE	BARREN LANDS, NON-SPECIFIC	DEVELOPED, MEDIUM-HIGH INTENSITY	INVASIVE SOUTHWEST RIPARIAN SHRUBLAND	WARM DESERT RIPARIAN MESQUITE BOSQUE	WARM DESERT RIPARIAN WOODLAND AND SHRUBLAND	NORTH AMERICAN WARM DESERT WASH	OPEN WATER	CREOSOTEBUSH-WHITE BURSAGE DESERTSCRUB	SONORA-MOJAVE MIXED SALT DESERTSCRUB	SONORAN PALOVERDE-MIXED CACTI-DEESRT SCRUB	TOTAL LENGTH (MILES)
Proposed Segments												
p-01	0	0	0.1	0	0	0	0	0	24.8	0	1.3	26.7
p-02	0	0	0	0	0	0	0	0	1.0	0	0	1.0
p-03	0	0	0	0	0	0	0	0	2.1	0	0	2.1
p-04	0	0	0	0	0	0	0	0	5.5	0	0	5.5
p-05	0	0	0	0	0	0	0	0	2.0	0	0	2.0
p-06	0	0.1	0	0	0	0	0	0	15.6	0	20.1	35.7
Alternative Segments												
d-01	7.6	0	0	0	0	0	0	0	16.6	0	1.0	25.2
i-01	0	0	0	0	0	0	0	0	8.4	0	0.1	8.3
i-02	0	0	0	0	0	0	0	0	3.3	0	0	3.3
i-03	0	0	0	0	0	0	0	0	16.9	0	3.1	19.9
i-04	0	0	0	0	0	0	0	0	1.2	0	9.2	10.5
in-01	0	0	0.1	0	0	0	0	0	3.8	0	10.0	13.9
x-01	0	0	0	0	0	0	0	0	4.7	0	0	4.7
x-02a	0	0	0	0	0	0	0	0	3.2	0	0	3.2
x-02b	0	0	0	0	0	0	0	0	3.4	0	0	3.4

SEGMENT	AGRICULTURE	BARREN LANDS, NON-SPECIFIC	DEVELOPED, MEDIUM-HIGH INTENSITY	INVASIVE SOUTHWEST RIPARIAN SHRUBLAND	WARM DESERT RIPARIAN MESQUITE BOSQUE	WARM DESERT RIPARIAN WOODLAND AND SHRUBLAND	NORTH AMERICAN WARM DESERT WASH	OPEN WATER	CREOSOTEBUSH-WHITE BURSAGE DESERTSCRUB	SONORA-MOJAVE MIXED SALT DESERTSCRUB	SONORAN PALOVERDE-MIXED CACTI-DEESRT SCRUB	TOTAL LENGTH (MILES)
x-03	0	0	0	0	0	0	0	0	5.6	0	0	5.6
x-04	0	0	0	0	0	0	0	0	21.1	0	1.6	22.6
Alt. SCS Dist. Line	0	0	0.2	0	0	0	0	0	0	2.9	0	3.1

From the eastern terminus of the Project at the Delaney Substation, the route crosses areas of the Lower Colorado River Valley Subdivision of the Sonoran Desert through the Harquahala and Ranegras plains (Appendix 1, Figure 3.5-1). Segment d-01 crosses about 5 miles of agricultural and developed land; the remainder of this and other segments in the Harquahala and Ranegras plains cross areas dominated by creosote-white bursage. Segment d-02 crosses a small, higher-elevation area of Arizona Upland Subdivision of the Sonoran Desert with paloverde-cacti-mixed scrub near the Eagletail Mountains. Washes along this part of the biological study area generally are small, with a lower abundance of ironwood, paloverde, and cacti than along segments in more-western regions. However, in the Harquahala Plain, Segment d-01 crosses Centennial Wash, which has dense stands of native and nonnative riparian vegetation to the north and south of the crossing. In the Ranegras Plain, Segments i-03 and x-04 cross relatively unvegetated parts of Bouse Wash. Other areas along Bouse Wash, primarily north of I-10, have stands of mesquite, big galleta, salt cedar, and bush muhly (Weinstein et al. 2003).

From the western edge of the Ranegras Plain, route Segment p-06 crosses the New Water Mountains and Livingston Hills on the Kofa NWR, primarily within the Arizona Upland Subdivision. Segments i-03, i-04, and in-01 that cross north of the New Water Mountains and through the southern extent of the Plomosa Mountains near I-10 are also within the Arizona Upland Subdivision. Many of the washes west of the Ranegras Plain are large and have dense stands of xeroriparian vegetation. Slopes of the surrounding hills have diverse stands of cacti.

Quartzsite Zone

Table 3.5-8 provides the vegetation types crossed by the Proposed Action and Alternative Segments in the Quartzsite zone.

In the Quartzsite Zone, to the west of the New Water Mountains and around Quartzsite, the route segments cross La Posa Plain. The valley bottom is dominated by creosote-bursage, and dense stands of vegetation are primarily restricted to washes, many of which are large and braided. Much of the area surrounding Quartzsite is developed or highly disturbed from OHVs and other recreational uses.

Copper Bottom Zone

Table 3.5-9 provides the vegetation types crossed by the Proposed Action and Alternative Segments in the Copper Bottom zone.

Route segments in the Copper Bottom Zone cross the Dome Rock Mountains through or near Copper Bottom Pass, within the Arizona Upland Subdivision of the Sonoran Desert, with diverse stands of cacti and upland vegetation in wash bottoms and on lower mountain slopes. The slopes along and surrounding most route segments are very steep and have less vegetation. Between the Dome Rock Mountains and the Colorado River, route segments cross lower elevation areas with large areas of desert pavement bisected by large and small washes.

The nearest sand dunes to the biological study area in Arizona are on and adjacent to the YPG, and northeast of Cibola, Arizona (Weinstein et al. 2003). Dunes in this area on land managed by the BLM are designated as a Wildlife Habitat Management Area (WHMA). The nearest route segments are more than 2 miles north of the nearest dunes and more than 3 miles from the BLM-designated WHMA.

Colorado River and California Zone
Table 3.5-10 provides the vegetation types crossed by the Proposed Action and Alternative Segments in the Colorado River and California zone.

The Colorado River crossing is in an area where riparian vegetation extends up to 0.7 mile east of the river. The vegetation in the river's floodplain is dominated by salt cedar and saltbush, with small, dense stands of mesquite and paloverde. Irrigated fields are immediately west of the river. Segment i-08s crosses the Colorado River where agricultural fields or developed land occur on both sides of the river. Riparian vegetation in California is limited to a narrow band adjacent to the river.

West of the Colorado River, route segments cross 9 to 10 miles of irrigated agricultural fields, orchards, and other developed land. Numerous irrigation canals and drains within agricultural fields contain open water for part or all of the year. Some of those canals and drains have dense stands of cattails (*Typha* sp.) and other wetland/riparian vegetation including arrowweed. Other native vegetation in the agricultural area is limited.

West of the agricultural fields, the route segments cross areas with very sandy soil on Palo Verde Mesa to reach the Colorado River Substation. The amount of sand in the soil increases, and the stability of the soil surface decreases from east to west. Segments ca-07, ca-09, and x-19 cross an area of active windblown sand deposition where Harwood's eriastrum appear to be present in relatively high numbers; Segments p-17 and p-18 cross sparse stands of creosote and white bursage (*Larrea tridentata* and *Larrea tridentata–Ambrosia dumosa* Shrubland Alliances) and a small number of protected washes with blue paloverde, mesquite, smoketree (*Psorothamnus spinosus*), and ironwood. The north-to-south-oriented Segments x-15 and x-16 and the west end of Segment ca-02 along the eastern edge of the Palo Verde Mesa cross a band of vegetation dominated by big galleta (*Pleuraphis rigida* Alliance), classified as imperiled and protected under the LUPA. Segments p-17 and p-18 do not cross soils classified as having active aeolian deposits, although a small area of active deposition is adjacent to Segment p-17, and dune obligate species have been recorded along a portion of Segment p-18.

On the Palo Verde Mesa, segments cross vegetation alliances within vegetation types that have a state ranking of S2 or S3 (imperiled or vulnerable) (Appendix 1, Figure 3.5-3). In addition, the semi-desert wash woodland vegetation type is considered sensitive by BLM (BLM 2002c). The *Parkinsonia florida–Olneya tesota* Alliance (blue palo verde–ironwood woodland) and *Prosopis glandulosa* Alliance (mesquite bosque, mesquite thicket) are both included in the Coloradan semi-desert wash woodland/scrub vegetation type and have a state ranking of 3.2 (vulnerable). Specifically, Segments p-17 and p-18 cross 0.3 mile of these washes. Segment ca-02 crosses 0.1 mile of narrow bands of mesquite near the western edge of cultivated lands at the edge of the Palo Verde Mesa. Sahara mustard, an invasive plant species, is scattered about the Palo Verde Mesa and is locally abundant in the sandier areas. No ESA-listed plant species, or plant species classified as endangered, threatened, or rare by the CDFW (2016c) occur in the Colorado River and California Zone. Harwood's eriastrum, a BLM sensitive species, and Harwood's milkvetch, a CNPS rare plant, are most common on dunes and other areas with loose sandy soils, and either one or both species have been documented within Segments ca-07, ca-09, p-16, p-17 p-18, x-16, and x-and x-19, especially in areas that include active windblown sand deposits (Appendix 1, Figure 3.3-8 and Figure 3.5-5).

Table 3.5-8 Land Cover Types by Segment in the Quartzsite Zone

SEGMENT	AGRICULTURE	BARREN LANDS, NON-SPECIFIC	DEVELOPED, MEDIUM-HIGH INTENSITY	INVASIVE SOUTHWEST RIPARIAN SHRUBLAND	WARM DESERT RIPARIAN MESQUITE BOSQUE	WARM DESERT RIPARIAN WOODLAND AND SHRUBLAND	NORTH AMERICAN WARM DESERT WASH	OPEN WATER	CREOSOTEBUSH-WHITE BURSAGE DESERTSCRUB	SONORA-MOJAVE MIXED SALT DESERTSCRUB	SONORAN PALOVERDE-MIXED CACTI-DEESRT SCRUB	TOTAL LENGTH (MILES)
Proposed Segments												
p-07	0	0	0	0	0	0	0	0	0.9	0	1.2	2.2
p-08	0	0	0	0	0	0	0	0	0	0	0.6	0.6
p-09	0	0	0	0	0	0	0	0	2.0	0	4.9	6.9
Alternative Segments												
qn-01	0	<0.1	0.1	0	0	0	0	0	0.2	0	0.3	0.6
qn-02	0	0.2	0.1	0	0	0	0	0	6.4	0	4.1	10.8
qs-01	0	0.1	0	0	0	0	0	0	1.8	0	1.2	3.1
qs-02	0	0	0	0	0	0	0	0	3.4	0	1.4	4.8
i-05	0	0.1	0	0	0	0	0	0	1.2	0	1.5	2.8
x-05	0	0	0	0	0	0	0	0	3.2	0	7.1	10.2
x-06	0	<0.1	0	0	0	0	0	0	2.0	0	7.2	9.2
x-07	0	0	0	0	0	0	0	0	2.3	0	5.4	7.7

Table 3.5-9 Land Cover Types by Segment in the Copper Bottom Zone

SEGMENT	AGRICULTURE	BARREN LANDS, NON-SPECIFIC	DEVELOPED, MEDIUM-HIGH INTENSITY	INVASIVE SOUTHWEST RIPARIAN SHRUBLAND	WARM DESERT RIPARIAN MESQUITE BOSQUE	WARM DESERT RIPARIAN WOODLAND AND SHRUBLAND	NORTH AMERICAN WARM DESERT WASH	OPEN WATER	CREOSOTEBUSH-WHITE BURSAGE DESERTSCRUB	SONORA-MOJAVE MIXED SALT DESERTSCRUB	SONORAN PALOVERDE-MIXED CACTI-DEESRT SCRUB	TOTAL LENGTH (MILES)
Proposed Segments												
p-10	0	0	0	0	0	0	0	0	0	0	1.1	1.1
p-11	0	0	0	0	0	0	0	0	0.8	0	3.2	4.1
p-12	0	0.1	0	0	0	0	0	0	1.4	0	1.0	2.5
p-13	0	0	0	0	0	0	0	0	1.6	0	1.9	3.5
p-14	0	0	0	0	0	0	0	0	0.5	0	0.4	0.9
Alternative Segments												
cb-01	0	0	0	0	0	0	0	0	0	0	3.2	3.2
cb-02	0	0	0	0	0	0	0	0	0.2	0	2.0	2.2
cb-03	0	<0.1	0	0	0	0	0	0	1.7	0	2.5	4.3
cb-04	0	0.1	0	0	0	0	0	0	1.4	0	0.4	1.9
cb-05	0	0	0	0	0	0	0	0	3.2	0	1.2	4.4
cb-06	0	0	0	0	0	0	0	0	1.1	0	0.8	1.9
i-06	0	0	0	0	0	0	0	0	5.0	0	2.1	7.2
i-07	0	0	0	0	0	0	0	0	3.5	0	2.8	6.3
x-08	0	0	0	0	0	0	0	0	1.1	0	0.1	1.3

Table 3.5-10 Land Cover Types by Segment in the Colorado River and California Zone

SEGMENT	AGRICULTURE	ATRIPLEX CANESCENS	DECIDUOUS ORCHARD, VINEYARD	DEVELOPED AND DISTURBED AREAS	IRRIGATED ROW AND FIELD CROPS	LARREA TRIDENTATA	LARREA TRIDENTATA-AMBROSIA DUMOSA	OPEN WATER	PARKINSONIA FLORIDA-OLNEYA TESOTA	PLEURAPHIS RIGIDA	PROSOPIS GLANDULOSA	SUAEDA MOQUINII	URBAN	TOTAL LENGTH (MILES)
Proposed Segments														
p-15e	0	0	0	0.2	0	0.1	0	0.1	1.4	0.1	1.0	2.9	0	2.8
p-15w	6.5	0	0	0	0	0	0	0.1	0	0	0	0	0	6.6
p-16	3.7	0.1	0	0	0	<0.1	0.8	0	0	0	<0.1	<0.1	<0.1	4.6
p-17	0	0	0	0	0	0.4	2.3	0	0.2	0	0.2	0	0	3.1
p-18	0	0	0	0	0	0.3	2.0	0	0.1	0	<0.1	0	0	2.4
Alternative Segments														
ca-01	6.6	0	0	0	0	0	0	0	0	0	0	0	0	6.7
ca-02	2.6	0.2	0	0	0	0.1	0.3	0	0	0.1	0.1	0	0	3.4
ca-04	0.7	0	0	0	0	0	0	0.1	0	0	0	0	0	0.8
ca-05	6.0	0	0	0.6	0	0	0	0	0	0	0	0	0	6.6
ca-06	0.9	0	0.8	0	<0.1	0.3	0.8	0	0	0	0	0	<0.1	2.8
ca-07	0	0	0	0	0	0.6	2.1	0	0.1	0.1	0	0	<0.1	3.0
ca-09	0	0	0	0	0	2.3	0.4	0	0	0.3	0	0	0	2.6
cb-10	0	0	0	0.2	0	0.1	<0.1	0.1	1.0	<0.1	0.4	1.8	0	1.9
i-08s	0.5	0	0	<0.1	<0.1	0.1	0	0.1	0.5	0	0.2	1.4	0	1.3

SEGMENT	AGRICULTURE	ATRIPLEX CANESCENS	DECIDUOUS ORCHARD, VINEYARD	DEVELOPED AND DISTURBED AREAS	IRRIGATED ROW AND FIELD CROPS	LARREA TRIDENTATA	LARREA TRIDENTATA-AMBROSIA DUMOSA	OPEN WATER	PARKINSONIA FLORIDA-OLNEYA TESOTA	PLEURAPHIS RIGIDA	PROSOPIS GLANDULOSA	SUAEDA MOQUINII	URBAN	TOTAL LENGTH (MILES)
x-09	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0.8
x-10	1.3	0	0	0	0	0	0	0	0	0	0	0	0	1.3
x-11	2.0	0	0	0	0	0	0	0.1	0	0	0	0	0	2.1
x-12	1.3	0	0	0	0	0	0	0	0	0	0	0	0	1.3
x-13	2.0	0	0	0	0	0	0	0	0	0	0	0	0	2.0
x-15	0	0	0	0	0	0	0.8	0	0	0.6	0	0	0	1.4
x-16	0	0	0	0	0	0	1.5	0	0	0.7	0	0	0	2.3
x-19	0	0	0	0	0	0.4	0.5	0	0	0	0	0	0	1.0

Two special status plants with a CNPS rare plant ranking of 1 or 2 have been found along segments on the Palo Verde Mesa. Harwood's eriastrum and Harwood's milkvetch, considered rare by the CNPS but not a BLM sensitive species, occur in sand dunes and other sandy soils (BLM 2012b, Appendix G; BLM and Riverside County Planning Department 2015, Appendix C1; Power Engineers 2012). Surveys of Proposed segments in 2016 did not locate these species (HDR 2016a), but in 2017, a total of 2,975 Harwood's milkvetch plants and 94 Harwood's eriastrum plants were recorded during surveys of route segments on the Palo Verde Mesa[4]. Figure 3.5-5 (Appendix 1) shows where rare plants were located during 2017 surveys (Transcon Environmental 2017); these surveys were restricted to a 200-foot-wide corridor centered on route segments. Both of these species are herbaceous annuals with highly variable year to year germination rates, generally dependent on rainfall; winter precipitation in 2016/2017 was well above average resulting in ideal conditions for surveys conducted in spring 2017 (Transcon Environmental 2017). Plant locations may shift among years reflecting scattered rainfall events and shifting sand dune habitat. Other projects have previously documented 3,402 Harwood's eriastrum plants from deep sandy soils on the Palo Verde Mesa, and over 25,000 Harwood's milkvetch plants (Ironwood Consulting Inc. 2016).

Harwood's eriastrum, as a BLM designated sensitive species, has special management requirements. A habitat model for this species was developed as part of the DRECP (BLM 2016h), and much of the Palo Verde Mesa is included as suitable for the species (Appendix 1, Figure 3.5-6). However, the DRECP model is based on general habitat conditions and includes areas where the plant is not expected to be found. When known locations of Harwood's eriastrum on the Palo Verde Mesa from California Natural Diversity Database (CNDDB) and occurrences documented by Project surveys are plotted with the California Geologic Survey surficial geology map (Appendix 1, Figure 3.3-8), there is a close correlation with active wind-blown sand deposits. But some locations do not fall within the mapped dune system, perhaps reflecting the dynamics of sand sediment and the patchy nature of these habitats not evident due to the mapping scale. In an effort to more accurately map suitable Harwood's eriastrum habitat on the Palo Verde Mesa, the locations from the CNDDB of Mojave fringe-toed lizards, another sand dune obligate species, was plotted with the plant occurrences and surficial geology data. These data tended to cluster observations and polygons of presumed suitable Harwood's eriastrum habitat (Appendix 1, Figure 3.5-6). This map was used to calculate the linear distance of potentially suitable Harwood's eriastrum habitat that would be crossed by each route segment on the Palo Verde Mesa (Table 3.5-11).

The following other special status plant species with a rare plant rank of 1 or 2 could be present on sandy soils on and near the Palo Verde Mesa, but were not found there during the 2016 (HDR 2016a) or 2017 (Transcon Environmental 2017) rare plant surveys: gravel milk-vetch, glandular ditaxis, Abram's spurge, flat-seeded spurge, and dwarf germander. Four other species have a low-to-moderate potential to be present in wash woodlands or higher elevation slopes in and adjacent to the study area: Las Animas colubrine, pink fairy-duster, bitter hymenoxys, and saguaro. More information about these and other plants listed in Table 3.5-5 can be found in BLM (2012c,

[4] Several of the route segments and corresponding access roads in this area were rerouted outside of the 2017 survey corridor after the survey occurred; therefore, not all Harwood's milkvetch and Harwood's eriastrum individuals present in 2017 within the current proposed ROW would have been recorded.

Appendix C), BLM and Riverside County Planning Department (2015), CNPS (2016), and BLM and CPUC (2006).

Table 3.5-11 Harwood's Eriastrum Plants Located during 2017 Surveys along Route Segments on the Palo Verde Mesa

SEGMENT	PLANTS LOCATED IN 2017 SURVEYS (NUMBER)	SUITABLE HARWOOD'S ERIASTRUM HABITAT INTERSECTED (MILES)
p-16	0	0
p-17	0	0
p-18	1	0.6
x-15	1	0.1
x-16	0	0
x-19	0 Partial survey	0.4
ca-02	Not surveyed	0
ca-06	Not surveyed	0
ca-07	65	1.1
ca-09	27	2.6

3.5.3.2 Wildlife, Including Special Status Wildlife and Migratory Birds

Introduction

The Project Area has a rich diversity of wildlife typical of the lower Sonoran Desert. The following description is taken primarily from BLM (2002c, Appendix N; 2006; 2008c; 2015a, Appendix Q), BLM and CPUC (2006), and YPG (2017). Wildlife in the Arizona portions of the Project Area is generally similar to wildlife in the California portion of the biological study area.

Amphibians and Reptiles

More than 40 species of reptiles are present in southwestern Arizona. Lizards and snakes are common, and some of the more common and widespread species are desert iguana (*Dipsosaurus dorsalis*), western whiptail (*Aspidoscelis tigris*), Great Basin collared lizard (*Crotaphytus bicinctores*), long-nosed leopard lizard (*Gambelia wislizenii*), zebra-tailed lizard (*Callisaurus draconoides*), desert spiny lizard (*Sceloporus magister*), desert horned lizard (*Phrynosoma platyrhinos*), common side-blotched lizard (*Uta stansburiana*), coachwhip snake (*Masticophis flagellum*), gopher snake (*Pituophis catenifer*), common kingsnake (*Lampropeltis getula*), western diamondback rattlesnake (*Crotalus atrox*), and Mojave rattlesnake (*Crotalus scutulatus*). Sonoran desert tortoises (*Gopherus morafkai*) are found primarily on rocky slopes and upper bajadas in the Arizona Upland subdivision, and the nonnative spiny softshell turtles (*Apalone spinifera*) are found in the Colorado River.

Couch's spadefoot toad (*Scaphiopus couchii*) is found in uplands throughout much of the Project Area and generally is active after summer rains. Other amphibians, such as the Sonoran desert toad

(*Incilius alvarius*), Woodhouse's toad (*Anaxyrus woodhousii*), and red-spotted toad (*Anaxyrus punctatus*) are more common near water sources.

Birds

More than 350 species of birds have been documented in southwestern Arizona (BLM 2006, 2008c; YPG 2017). Most of those species are protected under the MBTA. Common avian species include Gambel's quail (*Callipepla gambelii*), mourning dove (*Zenaida macroura*), white-winged dove (*Zenaidia asiatica*), verdin (*Auriparus flaviceps*), cactus wren (*Campylorhynchus brunneicapillus*), black-throated sparrow (*Amphispiza bilineta*), and black-tailed gnatcatcher (*Polioptila melanura*). Three of these species—Gambel's quail, mourning dove, and white-winged dove—are game species (ARS Title 17) and are classified as Species of Economic and Recreation Importance by the AGFD.

Raptors known to nest in the region include turkey vulture (*Cathartes aura*), American kestrel (*Falco spariverius*), prairie falcon (*Falco mexicanus*), peregrine falcon (*Falco peregrinus*), red-tailed hawk (*Buteo jamaicensis*), golden eagle (*Aquila chrysaetos*), great horned owl (*Bubo virginianus*), barn owl (*Tyto alba*), and burrowing owl (*Athene cunicularia*). Wintering migrant species include Cooper's hawk (*Accipiter cooperii*), ferruginous hawk (*Buteo regalis*), merlin (*Falco columbarius*), osprey (*Pandion haliaetus*), and sharp-shinned hawk (*Accipiter striatus*) (BLM 2008c; YPG 2017). Bald eagles (*Haliaeetus leucocephalus*) are uncommon along the lower Colorado River during winter. The AGFD's *Arizona Partners in Flight Bird Conservation Plan* (Latta et al. 1999) and BLM Yuma RMP (BLM 2010b) identify three major habitats for the conservation of birds that are present in or near the Project Area: Sonoran desertscrub, low-elevation riparian habitat (including xeroriparian washes), and freshwater marshes. Sonoran desertscrub and xeroriparian washes are found throughout the Project Area; riparian habitat and freshwater marshes are present only along the Colorado River.

Cultivated fields and other developed lands are west of the Colorado River, near the Delaney Substation, and along portions of I-10. Species common in desert agricultural areas include great-tailed grackle (*Quiscalus mexicanus*), Brewer's blackbird (*Euphagus cyanocephalus*), red-winged blackbird (*Agelaius phoeniceus*), and Eurasian collared-dove (*Streptopelia decaocto*).

Mammals

More than 60 mammalian species are present in southwestern Arizona (BLM 2008c). Many of these species are small, nocturnal rodents such as the pocket mouse (*Perognathus* spp.) and kangaroo rat (*Dipodomys* spp.). Twenty-two species of bats are present in the region (Weinstein et al. 2003). Many of these bat species use mine shafts, natural caves, and cliffs for roosting sites, and forage around water and along desert wash corridors. Furbearers and predatory mammals (as defined by Arizona Revised Statutes Title 17) found in the Project Area include coyote (*Canis latrans*), bobcat (*Lynx rufus*), desert kit fox (*Vulpes macrotis*), and American badger.

Four big-game species are present in the Arizona part of Project Area: desert bighorn sheep, desert mule deer (*Odococoileus hemionus eremicus*), collared peccary (*Pecari tajacu*), and mountain lion (*Puma concolor*). These species are classified as Species of Economic and Recreation Importance by the AGFD.

Desert bighorn sheep are present in Arizona in mountain ranges throughout the region, including the Saddle, Big Horn, Eagletail, Little Harquahala, Plomosa, New Water, and Dome Rock mountains (AGFD 2016a; BLM 2008c, 2008d, 2011c). Bighorn sheep depend on and are found near permanent water during dry and hot months. There are numerous water sources within the biological study area (Appendix 1, Figure 3.5-4) within or near habitat for bighorn sheep (AGFD 2016a). Lambing occurs year-round but peaks in January through April (BLM 2002c, 2008c). Important lambing areas in the region include rugged and isolated areas in the Plomosa Mountains, Livingston Hills, and New Water Mountains, within the Kofa NWR, and in the Dome Rock Mountains in the area surrounding Copper Bottom Pass (BLM 2008c; BLM, USFWS, and AGFD 1996; Weinstein et al. 2003).

Mule deer are found at a low abundance throughout the Project Area. They are present primarily in the foothills and lower slopes of mountains, and in desert washes in valley bottoms. During late spring and summer mule deer are concentrated around permanent water, such as the Colorado River and maintained wildlife waters, and disperse to surrounding areas during cooler and wetter months.

Collared peccary are found in the easternmost part of the Project Area, primarily in and surrounding the Harquahala and Ranegras plains. Currently, they are not present farther west in the Project Area in Arizona or in California.

Mountain lions are present at a low abundance throughout the Project Area in and near mountain ranges with sufficient populations of large mammals and other prey.

Special Status Wildlife Species

The special status wildlife species considered in this analysis include the following categories of animals:

- Animal species classified as proposed, threatened, or endangered under the Federal ESA;
- The most recent list of special status wildlife species as classified by the California BLM in accordance with BLM Manual 6840, Special Status Species Management (BLM 2010d, 2010e, 2015b);
- The most recent list of special status wildlife species as classified by the Arizona BLM in accordance with BLM Manual 6840, Special Status Species Management (BLM 2010d, 2010e, 2015b);
- Special status wildlife species as classified by the BLM and identified in RMPs (BLM 2002c, Table 3-5; BLM 2010e; BLM 2015a, Table III.7-33; BLM 2015b);
- Species of Greatest Conservation Need (SGCN) as identified by the AGFD (2012);
- Endangered, threatened, or rare species as classified under the California ESA (CDFW 2016b, 2016c);
- Animals identified by the CDFW as a Species of Special Concern (CDFW 2016d).

ESA Threatened, Endangered, and Proposed Wildlife Species

Species that are classified as threatened, endangered, or proposed and protected under the Federal ESA that could be present in the Project Area were identified by querying the USFWS's

Information for Planning and Conservation database (USFWS 2019), reviewing BLM RMPs and related documents, and evaluating published and unpublished information about the listed species.

Seven threatened and endangered species were identified that are known to be present or that could be present in or near the Project Area (Table 3.5-12). All species protected under the Federal ESA are classified as special status species by the BLM. Three other listed species are present in the region but are very rare or absent from the Project Area, and therefore will not be addressed further:

- **California least tern** (*Sterna antillarum browni*, endangered) uncommon in Arizona and western California and found on beaches, sand bars, shorelines, and other barren or sparsely vegetated areas near water. There is no habitat for this species along or near the proposed crossing of the Colorado River (USFWS 2006b) or elsewhere in the biological study area.
- **Northern Mexican gartersnake** (*Thamnophis eques megalops*, threatened) restricted to riparian areas such as wetlands, stock tanks, and riverine riparian woodlands and is found primarily in eastern Arizona. The only potential habitat for this species in the biological study area is along and near the Colorado River; this species likely has been extirpated from that area (USFWS 2013a, Table 1).
- **Roundtail chub** (*Gila robusta*, proposed threatened) have been extirpated from the mainstem of the Colorado River (BLM 2008c; Minckley et al. 2003).

Table 3.5-12 Federal ESA-Listed Threatened, Endangered, and Proposed Species in or near the Biological Study Area

SPECIES		STATUS[AB]	HABITAT	POTENTIAL FOR PRESENCE IN PROJECT AREA
Mammals				
Antilocapra americana sonoriensis	Sonoran pronghorn	ESA: E, NSE AZ: SGCN CA: N/A	Sonoran desertscrub in open valleys	Introduced in 2011 into Kofa NWR south of the Proposed Action. Has been documented along or near the route segments in and near the Refuge. Not expected to occur in California portion.
Birds				
Coccyzus americanus occidentalis	Western yellow-billed cuckoo	ESA: T AZ: SGCN CA: E BLM: Sensitive BLM: Focus Species	Nests in dense, wide riparian woodlands with well-developed understories	Present along the Colorado River in suitable habitat. Habitat at proposed river crossings is not suitable for nesting, although this species is likely to use the habitat during migration. The route segments cross proposed critical habitat along the Colorado River. Not expected to occur in California portion.

SPECIES		STATUS[AB]	HABITAT	POTENTIAL FOR PRESENCE IN PROJECT AREA
Empidonax traillii extimus	Southwestern willow flycatcher	ESA: E AZ: SGCN CA: E BLM: Sensitive BLM: Focus species	Nests in early successional riparian willow-dominated riparian habitats	Present along the Colorado River in suitable habitat. Habitat at proposed river crossings is not suitable for nesting, although this species could use the habitat during migration. Low potential to occur in California portion.
Rallus obsoletus yumanensis (Rallus longirostris yumanensis)	Yuma Ridgway's rail (Yuma clapper rail)	ESA: E AZ: SGCN CA: T, Fully Protected BLM: Sensitive BLM: Focus species	Freshwater marshes with stands of bulrushes and cattails	Known to be present in canals and drains adjacent to agricultural fields in California. No proposed crossing of the Colorado River has suitable marsh habitat, but there is potential habitat in nearby backwater channels. Moderate potential to occur in California portion.
Reptiles				
Gopherus agassizii	Mojave desert tortoise	ESA: T AZ: SGCN CA: T BLM: Sensitive BLM: Focus species	Desertscrub	Known to be present on the Palo Verde Mesa around the Colorado River Substation. Designated critical habitat 3 miles west of the substation. High potential to occur in California portion.
Fish				
Xyrauchen texanus	Razorback sucker	ESA: E AZ: SGCN CA: E BLM: Sensitive	*Spring* – deep runs, eddies, backwater, and flooded off-channels *Summer* – runs and pools in shallow water with sandbars; *Winter* – low-velocity runs, pools, and eddies	Known to be present in mainstream Colorado River and nearby backwaters in and near the Project Area. The transmission line would span critical habitat. Moderate potential to occur in California portion.
Gila elegans	Bonytail chub	ESA: E AZ: SGCN CA: E BLM: Sensitive	Mainstream rivers, possibly preferring rocky areas and areas with faster flow. Also use eddies and pools 1-3 m deep.	Hatchery reared fish are released into backwater channels near the TWL crossing of the Colorado River.

Source: USFWS (2019)

[A] E = Endangered; T = Threatened; NSE = Nonessential experimental population;

[B] BLM Focus species as designated under the DRECP LUPA

N/A = not applicable (species is not present in the state); SGCN = Species of Greatest Conservation Need

Sonoran Pronghorn

Sonoran pronghorn occupy desert plains and bajadas, and occasionally rocky hills and mountainous habitats. These animals are nomadic and require large expanses of land to survive as localized droughts are frequent and summer rains are sporadic. They must be able to move across the landscape during all seasons to locate areas with sufficient food and water. Sonoran pronghorn are very wary, capable of seeing long distances across the open desert, and flee the area when disturbed.

Sonoran pronghorn are classified as endangered, and a nonessential experimental population has been established to reintroduce this subspecies in the Kofa NWR and a large surrounding area (USFWS 2011). When evaluating the effects of Federal actions as required under Section 7 of the ESA, Federal agencies must treat nonessential experimental populations on national wildlife refuges or units of the National Park Service (NPS) as they would treat threatened species, and as a proposed species elsewhere. The route segments in Arizona south of I-10 are within that designated nonessential experimental population area. The Sonoran pronghorn is classified as a SGCN in Arizona.

Western Yellow-billed Cuckoo

The western distinct population segment of the yellow-billed cuckoo is classified as threatened under the Federal ESA. It is classified as a SGCN by the AGFD, and as endangered by the CDFW.

Western yellow-billed cuckoos are found during the summer in low- to medium-elevation deciduous riparian woodlands throughout much of western North America. They nest in relatively large patches of riparian woodlands (generally larger than 50 acres) that typically have a well-developed riparian overstory canopy and an understory of shrubs (Halterman et al. 2015; USFWS 2013b).

Critical habitat for this species has been proposed by the USFWS along a 139-mile-long section of the Colorado River north of the border with Mexico (USFWS 2014a, p. 48596). This area "has a small existing number of breeding yellow-billed cuckoos, but has a great potential for riparian habitat restoration, which is currently being implemented. Western yellow-billed cuckoos are colonizing these restoration sites as soon as they provide suitable habitat. It provides movement corridors to habitat patches farther north" (USFWS 2014a, p. 48561).

The three primary constituent elements of proposed critical habitat for the western yellow-billed cuckoo are (USFWS 2014a, p. 48554):

- Riparian woodlands with mixed willow-cottonwood vegetation or a combination of these that contain habitat for nesting and foraging in contiguous or nearly contiguous patches that are greater than 325 feet in width and 200 acres or more in extent;
- An adequate prey base consisting of large insect fauna and tree frogs; and
- Dynamic riverine process that provides hydrologic processes that encourage sediment movement and deposits that allow seedling growth, maintenance, health, and vigor.

Southwestern Willow Flycatcher

This species is classified as a SGCN in Arizona and as endangered in California. The southwestern willow flycatcher nests in willows and other dense riparian vegetation along streams, rivers, lakes, and wetlands. Southwestern willow flycatchers are found along the lower Colorado River and tributaries where suitable dense stands of willow or salt cedar are adjacent to water or saturated soil. There is no suitable nesting habitat along any of the route segments that cross the river because very little or no riparian vegetation is adjacent to the river, and stands of nonnative salt cedar do not provide the complex habitat structure needed to support nesting flycatchers.

Yuma Ridgway's Rail (Yuma Clapper Rail)

The Yuma Ridgway's rail is listed as endangered under the Federal ESA. It is classified as a SGCN in Arizona and as threatened in California. It is also classified as fully protected under the CFGC. Critical habitat has not been designated for this bird.

The taxonomic classification of *R. longirostris yumanensis* has been modified, with all subspecies of clapper rails in parts of western Mexico, southern California, Arizona, and elsewhere in the lower Colorado River basin, including *yumanensis,* now considered Ridgway's rail (*Rallus obseletus*) (BirdLife International 2016).

Mojave Desert Tortoise

The Mojave desert tortoise is classified as threatened under the Federal ESA and as threatened under the California ESA. The desert tortoise found in southwestern Arizona is considered a separate species, the Sonoran desert tortoise, and is not protected under the Federal ESA. Within the Colorado River and California Zone, potential habitat for the Mojave desert tortoise occurs on Palo Verde Mesa west of the agricultural areas. Though the sandiest areas are typically not well suited to support Mojave desert tortoise burrows, sign of Mojave desert tortoises representing a low density population have been found in the vicinity of the Colorado River Substation and elsewhere on the mesa. Habitat conditions tend to improve closer to the Mule Mountains, about 2 miles south of the substation.

The USGS has created a model that predicts the likelihood that areas in the Mojave Desert and parts of the Sonoran Desert provide habitat for desert tortoises (Nussear et al. 2009). That model ranks habitat potential on a scale of 0 (no habitat) to 1 (habitat). The areas crossed by the route segments in California are ranked from 0 to 0.4, with areas within about 2 miles of the Colorado River Substation having the highest potential (Appendix 1, Figure 3.5-7). Tortoise survey data collected in the project area for other projects, including Desert Quartzite, corroborates the low tortoise habitat values predicted by the model. The factors in the project area that make the area less suitable for tortoises are sandy soils (unsuitable for tortoise burrows), and low diversity, sparseness, and small size of shrubs. The upper bajadas near the base of the Mule Mountains provide more suitable habitat because of the incised washes and caves used for cover sites.

Razorback Sucker

The razorback sucker is classified as endangered under the Federal ESA, as a SGCN in Arizona, and as endangered in California. The CFGC classifies the species as fully protected.

Areas within the 100-year floodplain along the Colorado River from Parker Dam to Imperial Dam (including the locations proposed to be crossed by this Project) that contain constituent elements for this species are designated as critical habitat. Those constituent elements include "water, physical habitat, and biological environment as required for each life stage of this species" (USFWS 1994a, pp. 13399-13400). The 100-year floodplain is 300- to 500-feet-wide at the proposed crossing locations.

<u>*Bonytail Chub*</u>

The bonytail chub is classified as endangered under the Federal ESA, as a SGCN in Arizona, and as endangered in California. The CFGC classifies the species as fully protected.

Critical habitat was designated in 1994 (59 FR 13374), including portions of the Colorado, Green, and Yampa rivers in the upper Colorado River basin, and portions of the lower Colorado River north of Parker Dam. The Project does not cross designated habitat for this species. Bonytail have been and continue to be released into the A10 backwater and other backwater channels near where the Project would cross the Colorado River (USBR 2015). Mortality of stocked fish appears to be very high within the backwaters (McCall et al. 2017).

This fish was once widespread throughout the Colorado River basin. In the lower basin, it is now found in Lake Mohave, Lake Mead, and the mainstream river channel below Lake Havasu, including the section of the river proposed to be crossed by the Project (LCRMSCP 2016).

Other Special Status Wildlife Species – Arizona

Special status wildlife species (not including Federal ESA-listed species) that are present or could be present in and near the Project Area in Arizona were identified primarily from the following sources of information:

- BLM Land Use Plans and associated documents (BLM 2006, 2008c, 2008d, 2011c)
- AGFD's HabiMap database and available analysis tools (AGFD 2016a)
- AGFD's Natural Heritage Program Animal Abstracts (AGFD Natural Heritage Program n.d.) and other information available from that program
- Arizona's State Wildlife Action Plan: 2012 – 2022 (AGFD 2012)
- Final Environmental Impact Report (EIR)/EIS for the Devers to Palo Verde No. 2 Transmission Line Project (BLM and CPUC 2006)

Table 3.5-13 provides a list of these special status species, identifies general habitat, and lists status designations. The distance of potential habitat of special status species that is crossed by each route segment is listed in Tables 3.5-14 through 3.5-16. AGFD staff used data from the AGFD Habimap database (AGFD 2016a) to calculate the data in these tables. The tables contain data only for those special status species for which data were available in the Habimap database. The distribution of potential habitat for each species is based on habitat models and could contain areas that are not used by or suitable for a species. For additional information on the distribution and status of the special status species, see BLM and CPUC (2006), AGFD (2016a), and AGFD Natural Heritage Program (n.d.).

Table 3.5-13 Special Status Wildlife Species (not including Federal ESA-listed species) that Could Occur within or near the Biological Study Area in Arizona

SPECIES		STATUS DESIGNATION (ARIZONA/BLM)	HABITAT
Amphibians			
Incillius alvarius	Sonoran desert toad	Arizona: SGCN	Central and southern Arizona within several miles of permanent or temporary water sources.
Reptiles			
Lichanura trivirgata	Rosy boa	Arizona: SGCN	Rocky areas or boulder fields in mountains, bajadas, and hillsides in Sonoran desertscrub.
Heloderma suspectum	Gila monster	Arizona: SGCN	Prefers rocky areas in desertscrub and semi-desert grassland. Found in lower mountain slopes, rocky bajadas, canyon bottoms, and arroyos.
Gopherus morafkai	Sonoran desert tortoise	Arizona: SGCN BLM: Sensitive	Rocky terrain in Sonoran desertscrub.
Kinosternon sonoriense sonoriense	Sonora mud turtle	BLM: Sensitive	Usually found in rocky streams, creeks, and rivers. It also inhabits ponds, cattle tanks, and ditches. Within Project Area, rare along lower Colorado River.
Micruroides euryxanthus	Sonoran coralsnake	Arizona: SGCN	Sonoran, Mohave, and Chihuahuan desertscrubs, through Semi-desert Grassland, and into the lower reaches of the woodlands. Usually encountered in or near rocky or gravelly drainages, mesquite-lined washes, and canyons.
Uma scoparia	Mojave fringe-toed lizard	Arizona: SGCN BLM: Sensitive	Sparsely vegetated arid areas with fine wind-blown sand, including dunes, flats with sandy hummocks formed around the bases of vegetation, washes, and the banks of rivers. Needs fine, loose sand for burrowing.

SPECIES		STATUS DESIGNATION (ARIZONA/BLM)	HABITAT
Fish - None (see Table 3.5-12 for federally listed fish)			
Birds (see Table 3.5-12 for federally listed birds)			
Melozone aberti	Abert's towhee	Arizona: SGCN	Low-elevation desert riparian and desert wash habitats. Habitat includes dense vegetation, including thickets of willow, cottonwood, mesquite, and saltcedar. Likely restricted to within and near xeroriparian washes with dense shrubs and agricultural areas within Project Area.
Botaurus lentiginosus	American bittern	Arizona: SGCN	Marshlands and very wet meadows. Rarely seen away from dense reeds, rushes, cordgrass, cattails and other emergent vegetation. Within Project Area, restricted to Colorado River.
Vireo bellii arizonae	Arizona Bell's vireo	Arizona: SGCN	Desert riparian woodlands, primarily with dense willow or mesquite. Uncommon along lower Colorado River.
Haliaeetus leucocephalus	Bald eagle	Arizona: SGCN BLM: Sensitive	Coasts, rivers, and large lakes. Open country and mountains during migration. Migrant and winter resident along lower Colorado River.
Laterallus jamaicensis coturniculus	California black rail	BLM: Sensitive	Salt and brackish water marshes. Occurs in the lower Colorado River in areas of pickle weed thickets.
Progne subis hesperia	Desert purple martin	Arizona: SGCN BLM: Sensitive	Open, flat areas and farms. Inhabits saguaros in southern Arizona. Much more common in southcentral Arizona than within and near Project Area.
Buteo regalis	Ferruginous hawk	Arizona: SGCN BLM: Sensitive	Plains and prairies throughout western North America. In southwestern Arizona, migrant and winter resident primarily near cultivated fields.
Melanerpes uropygialis	Gila woodpecker	Arizona: SGCN	Upper Sonoran desert in areas with stands of saguaro, riparian woodlands, and suburban areas.
Colaptes chrysoides	Gilded flicker	Arizona: SGCN BLM: Sensitive	Upper Sonoran desert in areas with stands of saguaro, riparian woodlands, and suburban areas.
Aquila chrysaetos	Golden eagle	Arizona: SGCN BLM: Sensitive	Open areas, plains, and mountains throughout North America. Nests in mountains of western Arizona.

SPECIES		STATUS DESIGNATION (ARIZONA/BLM)	HABITAT
Toxostoma lecontei	Le Conte's thrasher	Arizona: SGCN BLM: Sensitive	Flat desert areas with sparse vegetation, especially saltbush flats.
Melospiza lincolnii	Lincoln's sparrow	Arizona: SGCN	Winters in the southern United States in brushes and weedy habitats. Within Project Area, restricted to Colorado River and possibly along large xeroriparian washes.
Charadrius montanus	Mountain plover	Arizona: SGCN	Winters in semiarid plains and flats in the southwestern United States. Uncommon or rare along lower Colorado River.
Falco peregrinus anatum	Peregrine falcon	BLM: Sensitive	Open country and cliffs. Sometimes inhabits urban areas. Uncommon resident in southwestern Arizona.
Tyrannus crassirostris	Thick-billed kingbird	Arizona: SGCN	Breeds in southeastern Arizona in riparian gallery forests. Rare in winter along Colorado River.
Athene cunicularia hypugaea	Western burrowing owl	Arizona: SGCN BLM: Sensitive	Utilizes burrows made by mammals in arid regions and deserts. Within Project Area, likely to be common only near agricultural areas and along and near Colorado River.
Aix sponsa	Wood duck	Arizona: SGCN	Wooded areas of rivers and ponds. Uncommon in winter along the lower Colorado River.
Mammals (see Table 3.5-12 for federally listed mammals)			
Idionycteris phyllotis	Allen's (Mexican) big-eared bat	BLM: Sensitive	Forested areas above 3,000 feet.
Castor canadensis	American beaver	Arizona: SGCN	Rivers, streams, and lakes. Could occur along Colorado River.
Myotis occultus	Arizona myotis	Arizona: SGCN BLM: Sensitive	In southwestern Arizona, they are found along the lower Colorado River.
Perognathus amplus	Arizona pocket mouse	Arizona: SGCN	Valley bottoms with shrub cover and stable soil. Likely to occur in Harquahala and Ranegras plains.
Macrotus californicus	California leaf-nosed bat	Arizona: SGCN BLM: Sensitive	Mostly found in the Sonoran desertscrub; summer and winter range the same; primarily roost in mines, caves, and rock shelters.

SPECIES		STATUS DESIGNATION (ARIZONA/BLM)	HABITAT
Myotis velifer	Cave myotis	Arizona: SGCN BLM: Sensitive	Desertscrub of creosote, brittlebush, palo verde, and cacti. Roost in caves, tunnels, and mineshafts, and under bridges, and sometimes in buildings within a few miles of water.
Sigmodon arizonae plenus	Colorado River cotton rat	Arizona: SGCN	Riparian thickets, dense grass cover, drier grassy areas. Restricted to Colorado River floodplain and surrounding area.
Ovis canadensis mexicana	Desert bighorn sheep	Arizona: SGCN	Desert crags, rocky outcrops, and valleys in southern Arizona. Occurs in all mountain ranges throughout Project Area.
Invertebrates – None			

Notes: AGFD = Arizona Game and Fish Department, BLM = Bureau of Land Management, SGCN = Species of Greatest Conservation Need

Table 3.5-14 Length of Special Status Wildlife Species Habitat Intersected by the Proposed Action Route Segments in Arizona, in Miles

SPECIES HABITAT	PROPOSED ACTION SEGMENT														
	P-01	P-02	P-03	P-04	P-05	P-06	P-07	P-08	P-09	P-10	P-11	P-12	P-13	P-14	P-15E
Geographic Area[a]	EP&K	EP&K	EP&K	EP&K	EP&K	EP&K	QTZ	QTZ	QTZ	CB	CB	CB	CB	CB	CB
Sonoran desert toad	2.2	0.0	0.1	0.3	0.2	3.4	0.2	0.0	0.7	0.2	0.2	1.2	0.8	0.4	0.5
Gila monster	29.2	1.5	2.9	5.8	2.1	41.3	2.6	0.8	8.6	1.4	5.4	3.7	4.8	1.3	3.3
Mojave fringe-toed lizard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sonoran desert tortoise	3.7	0.0	1.3	0.4	0.7	21.0	0.0	0.0	2.6	1.1	5.1	0.0	0.0	0.0	0.0
Sonoran coral snake	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Abert’s towhee	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
American bittern	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Arizona Bell’s vireo	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bald eagle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Brewer’s sparrow	1.2	0.0	0.0	0.0	0.0	24.1	1.5	0.8	6.3	1.6	4.4	1.4	2.7	0.5	1.1
Brown-crested flycatcher	0.5	0.0	0.0	0.0	0.0	8.9	0.0	0.0	0.0	0.8	4.4	1.4	1.9	0.0	1.4
Costa’s hummingbird	1.2	0.0	0.0	0.0	0.0	24.1	1.5	0.8	6.3	1.6	4.4	1.4	2.7	0.5	1.1
Elf owl	1.2	0.0	0.0	0.0	0.0	24.1	1.5	0.8	6.3	0.8	0.0	0.0	0.0	0.0	0.0
Ferruginous hawk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gila woodpecker	1.3	0.0	0.0	0.0	0.0	24.1	1.5	0.8	6.3	1.6	4.4	1.4	2.7	0.5	1.2
Gray vireo	0.0	0.0	0.0	0.0	0.0	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gilded flicker	1.2	0.0	0.0	0.0	0.0	24.1	1.5	0.8	6.3	1.6	4.4	1.4	2.7	0.5	1.1
Golden eagle	0.0	0.0	0.0	0.0	0.0	11.7	1.7	0.8	6.5	0.8	0.0	0.0	0.0	0.0	0.0
Le Conte’s thrasher	27.9	1.5	2.9	5.8	2.1	16.7	1.1	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0
Lucy’s warbler	1.2	0.0	0.0	0.0	0.0	24.1	1.5	0.8	6.3	1.6	4.4	1.4	2.7	0.5	1.3
Marsh wren	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Mountain plover	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sage sparrow	27.9	1.5	2.9	5.8	2.1	16.7	1.1	0.0	2.2	0.0	1.0	2.1	2.0	0.8	1.8
Sage thrasher	27.9	1.5	2.9	5.8	2.1	16.7	1.1	0.0	2.2	0.0	1.0	1.0	0.0	0.0	0.0
Savannah sparrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sprague’s pipit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Virginia rail	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Western burrowing owl	0.3	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.8	4.4	1.5	2.5	0.5	1.2
Western least bittern	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SPECIES HABITAT	PROPOSED ACTION SEGMENT														
	P-01	P-02	P-03	P-04	P-05	P-06	P-07	P-08	P-09	P-10	P-11	P-12	P-13	P-14	P-15E
Western yellow-billed cuckoo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.38	0.1	0.3
Wood duck	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
American beaver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
Arizona myotis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
California leaf-nosed bat	23.6	0.0	1.0	5.8	0.2	31.2	2.6	0.8	8.6	1.6	5.4	3.6	4.8	1.3	3.0
Arizona pocket mouse	29.3	1.5	2.9	5.8	2.1	28.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cave myotis	29.3	1.5	2.9	5.8	2.1	41.3	2.6	0.8	8.6	1.6	5.4	3.6	4.8	1.3	2.3
Colorado River cotton rat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	4.5	1.2	3.2
Desert bighorn sheep	3.2	0.0	0.0	1.3	1.0	5.8	0.0	0.0	6.4	1.6	5.4	0.8	0.0	0.0	0.0
Greater Western mastiff bat	29.3	1.5	2.9	5.8	2.1	41.3	2.6	0.8	8.6	1.6	5.4	3.6	4.8	1.3	2.9
Harquahala Southern pocket gopher	29.0	1.5	2.9	5.8	1.8	15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Harris' antelope squirrel	29.3	1.5	2.9	5.8	2.1	41.3	2.6	0.8	8.6	1.6	5.4	3.6	4.8	1.3	3.2
Kit fox	29.3	1.5	2.9	5.8	2.1	41.3	2.6	0.8	8.6	1.6	5.4	3.6	4.8	1.3	2.8
Little pocket mouse	29.3	1.5	2.9	5.8	2.1	41.3	2.6	0.8	8.6	1.6	5.4	3.6	4.8	1.3	2.8
Mexican free-tailed bat	29.4	1.5	2.9	5.8	2.1	41.4	2.6	0.8	8.6	1.6	5.4	3.7	4.8	0.8	0.5
Pale Townsend's big-eared bat	29.4	1.5	2.9	5.8	2.1	41.4	2.6	0.8	8.6	1.6	5.4	3.7	4.8	1.3	3.1
Pocketed free-tailed bat	3.0	0.0	0.0	0.0	0.0	26.1	2.2	0.8	6.8	1.6	4.7	1.8	3.5	0.8	1.7
Spotted bat	27.7	1.5	2.9	5.8	2.1	17.2	1.1	0.0	2.3	0.0	0.9	2.2	2.2	0.8	2.0
Western red bat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
Western yellow bat	29.4	1.5	2.9	5.8	2.1	41.4	2.6	0.8	8.6	1.6	5.4	3.7	2.7	0.0	0.0
Yuma myotis	29.3	1.5	2.9	5.8	2.1	41.3	2.6	0.8	8.6	1.6	5.4	3.6	4.8	1.3	3.2

[a] Geographic Area: EP&K = East Plains and Kofa Zone, QTZ = Quartzsite Zone, CB = Copper Bottom Zone, CR&CA – Colorado River and California Zone

Table 3.5-15 Length of Special Status Wildlife Species Habitat Intersected by Alternative Route Segments d-01, x-01 to x-08, and i-01 to i-08s in Arizona, in Miles

SPECIES HABITAT	ALTERNATIVE ROUTE SEGMENT																
	D-01	X-01	X-02	X-03	X-04	X-05	X-06	X-07	X-08	I-01	I-02	I-03	I-04	I-05	I-06	I-07	I-08S
Geographic Area[a]	EP&K	EP&K	EP&K	EP&K	EP&K	QTZ	QTZ	QTZ	CB	EP&K	EP&K	EP&K	EP&K	QTZ	CB	CB	CR&CA
Sonoran desert toad	1.6	0.3	0.1	0.2	1.1	1.7	1.4	0.8	0.4	0.1	0.0	1.2	1.7	1.5	1.6	1.7	0.1
Gila monster	21.0	9.5	9.2	7.9	29.4	13.2	11.2	8.0	1.5	9.8	3.8	23.4	12.2	3.2	8.4	7.9	1.4
Mojave fringe-toed lizard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sonoran desert tortoise	0.7	0.0	0.0	1.0	0.6	0.0	0.0	0.0	0.0	0.0	0.1	2.5	11.0	0.0	5.6	0.0	0.0
Sonoran coral snake	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	1.3	5.8	0.0	0.0	0.0	0.0
Abert’s towhee	7.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	2.4	0.0	0.0	2.0	3.5	0.8
American bittern	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Arizona Bell’s vireo	0.2	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Bald eagle	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
Brewer’s sparrow	8.8	0.0	0.0	0.0	2.1	9.2	8.7	5.4	0.1	0.1	0.0	3.5	10.8	1.8	2.5	3.4	0.6
Brown-crested flycatcher	0.0	0.0	0.0	0.0	0.0	0.6	0.2	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.2	3.2	0.4
Costa’s hummingbird	1.0	0.0	0.0	0.0	2.1	9.2	8.7	5.4	0.1	0.1	0.0	3.5	10.8	1.8	2.5	3.4	0.2
Elf owl	1.0	0.0	0.0	0.0	2.1	9.2	8.7	5.4	0.0	0.1	0.0	3.5	10.8	1.8	0.0	0.0	0.0
Ferruginous hawk	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Gila woodpecker	1.0	0.0	0.0	0.0	2.1	9.2	8.7	5.4	0.1	0.1	0.0	3.5	10.8	1.8	2.5	3.4	0.3
Gray vireo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gilded flicker	1.0	0.0	0.0	0.0	2.1	9.2	8.7	5.4	0.1	0.1	0.0	3.5	10.8	1.8	2.5	3.4	0.3
Golden eagle	0.0	0.0	0.0	0.0	0.0	9.3	8.9	5.4	0.0	0.0	0.0	0.0	5.0	1.8	0.5	0.0	0.0
Le Conte’s thrasher	19.8	9.5	9.2	7.9	27.2	3.9	2.4	2.4	0.0	9.7	3.8	19.5	1.3	1.3	1.7	0.0	0.0
Lucy’s warbler	1.0	0.0	0.0	0.0	2.1	9.2	8.7	5.4	0.1	0.1	0.0	3.5	10.8	1.8	2.5	3.4	0.3
Marsh wren	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
Mountain plover	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Pacific wren	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Sage sparrow	19.8	9.5	9.2	7.9	27.2	3.9	2.4	2.4	1.4	9.7	3.8	19.5	1.3	1.3	5.6	4.3	0.6
Sage thrasher	19.8	9.5	9.2	7.9	27.2	3.9	2.4	2.4	1.4	9.7	3.8	19.5	1.3	1.3	5.6	0.4	0.0
Savannah sparrow	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Sprague’s pipit	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Virginia rail	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Western burrowing owl	1.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	2.0	0.0	0.0	2.0	3.4	0.3

SPECIES HABITAT	ALTERNATIVE ROUTE SEGMENT																
	D-01	X-01	X-02	X-03	X-04	X-05	X-06	X-07	X-08	I-01	I-02	I-03	I-04	I-05	I-06	I-07	I-08S
Western least bittern	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Western yellow-billed cuckoo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Wood duck	0.0	0.0	0.0	0.0	<0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
American beaver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
Arizona myotis	0.0	0.0	0.0	<0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
California leaf-nosed bat	14.9	2.4	4.5	0.0	3.5	13.2	11.2	8.0	1.5	4.4	0.0	6.3	12.2	3.2	8.4	7.9	0.9
Arizona pocket mouse	18.6	9.5	9.2	7.9	29.4	0.0	0.0	0.0	0.0	9.8	3.8	23.4	6.6	0.0	0.0	0.0	0.0
Cave myotis	21.0	9.5	9.2	7.9	29.4	13.2	11.2	8.0	1.5	9.8	3.8	23.4	12.2	3.2	8.4	7.9	0.7
Colorado River cotton rat	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	7.8	1.3
Desert bighorn sheep	0.0	0.0	0.0	1.0	2.0	1.7	0.0	0.0	0.9	0.0	0.0	1.5	7.5	0.0	7.2	0.0	0.0
Greater Western mastiff bat	28.8	9.5	9.2	7.9	29.4	13.2	11.2	8.0	1.5	9.8	3.8	23.4	12.2	3.2	8.4	7.9	1.2
Harquahala Southern pocket gopher	21.0	9.5	9.2	7.9	16.8	0.0	0.0	0.0	0.0	9.8	3.8	12.5	0.0	0.0	0.0	0.0	0.0
Harris' antelope squirrel	21.0	9.5	9.2	7.9	29.4	13.2	11.2	8.0	1.5	9.8	3.8	23.4	12.2	3.2	8.4	7.9	0.9
Kit fox	21.0	9.5	9.2	7.9	29.4	13.2	11.2	8.0	1.5	9.8	3.8	23.4	12.2	3.2	8.4	7.9	0.8
Little pocket mouse	21.0	9.5	9.2	7.9	29.4	13.2	11.2	8.0	1.5	9.8	3.8	23.4	12.2	3.2	8.4	7.9	0.8
Mexican free-tailed bat	28.8	9.5	9.2	7.9	29.4	13.2	11.3	8.0	1.5	9.8	3.8	23.4	12.2	3.2	8.4	5.5	0.0
Pale Townsend's big-eared bat	28.8	9.5	9.2	7.9	29.4	13.2	11.3	8.0	1.5	9.8	3.8	23.4	12.2	3.2	8.4	7.9	1.3
Pocketed free-tailed bat	2.1	0.0	0.0	0.0	3.2	10.8	10.1	6.6	0.3	0.2	0.0	5.2	11.3	2.3	3.9	5.1	0.3
Spotted bat	19.7	9.5	9.2	7.9	27.3	3.9	2.5	2.6	1.4	9.7	3.8	19.7	1.5	1.4	5.8	4.3	0.7
Western red bat	0.0	0.0	0.0	0.0	<0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Western yellow bat	21.0	9.5	9.2	7.9	29.4	13.2	11.3	8.0	1.5	9.8	3.8	23.4	12.2	3.2	8.4	2.9	0.0
Yuma myotis	21.0	9.5	9.2	7.9	29.4	13.2	11.2	8.0	1.5	9.8	3.8	23.4	12.2	3.2	8.4	7.9	1.0

[a]Geographic Area: EP&K = East Plains and Kofa Zone, QTZ = Quartzsite Zone, CB = Copper Bottom Zone, CR&CA – Colorado River and California Zone

Table 3.5-16 Length of Special Status Wildlife Species Habitat Intersected by Alternative Route Segments in-01, cb-01 to cb-10, qn-01, qn-02, qs-01, and qs-02 in Arizona, in Miles

SPECIES HABITAT	ALTERNATIVE ROUTE SEGMENT											
	IN-01	CB-01	QN-01	CB-02	QN-02	CB-03	QS-01	CB-04	QS-02	CB-05	CB-06	CB-10
Geographic Area[a]	EP&K	CB	QTZ	CB	EP&K	CB	QTZ	CB	QTZ	CB	CB	CB
Sonoran desert toad	2.3	0.0	0.2	0.2	1.8	0.4	1.0	0.6	1.4	0.9	0.1	0.1
Gila monster	15.9	3.7	0.5	2.5	12.2	5.7	3.6	2.2	5.7	5.2	2.7	1.8
Mojave fringe-toed lizard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0
Sonoran desert tortoise	10.3	3.7	0.1	2.5	1.8	5.1	0.0	0.9	2.0	0.0	0.0	0.0
Sonoran coral snake	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Abert's towhee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
American bittern	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Arizona Bell's vireo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bald eagle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Brewer's sparrow	11.5	3.7	0.4	2.4	4.9	3.2	1.4	0.5	1.3	1.3	1.1	0.3
Brown-crested flycatcher	0.0	0.9	0.0	1.5	0.0	3.2	0.0	0.0	0.0	0.5	0.0	0.7
Costa's hummingbird	11.5	3.7	0.4	2.4	4.9	3.2	1.4	0.5	1.3	1.3	1.1	0.3
Elf owl	11.5	0.8	0.4	0.0	3.5	0.0	1.4	0.0	0.6	0.0	0.0	0.0
Ferruginous hawk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gila woodpecker	11.6	3.7	0.4	2.4	5.0	3.2	1.4	0.5	1.3	1.3	1.1	0.5
Gray vireo	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gilded flicker	11.5	3.7	0.4	2.4	4.9	3.2	1.4	0.5	1.3	1.3	1.1	0.4
Golden eagle	6.7	0.8	0.4	0.0	5.3	0.0	1.8	0.0	1.9	0.0	0.0	0.0
Le Conte's thrasher	4.1	0.0	0.1	0.0	6.9	0.0	2.1	0.0	4.2	0.0	0.0	0.0
Lucy's warbler	11.5	3.7	0.4	2.4	4.9	3.2	1.4	0.5	1.3	1.3	1.1	0.6
Marsh wren	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Mountain plover	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific wren	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Sage sparrow	4.1	0.0	0.1	0.2	6.9	2.1	2.1	1.7	4.2	3.8	1.5	1.0
Sage thrasher	4.1	0.0	0.1	0.2	6.9	2.1	2.1	1.7	4.2	1.1	1.0	0.0
Savannah sparrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sprague's pipit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Virginia rail	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Western burrowing owl	0.0	2.9	0.0	2.4	0.0	3.4	0.0	0.5	0.0	1.2	1.1	0.5

SPECIES HABITAT	ALTERNATIVE ROUTE SEGMENT											
	IN-01	CB-01	QN-01	CB-02	QN-02	CB-03	QS-01	CB-04	QS-02	CB-05	CB-06	CB-10
Western least bittern	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Western yellow-billed cuckoo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.3
Wood duck	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
American beaver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Arizona myotis	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2
California leaf-nosed bat	15.9	3.7	0.5	2.5	12.2	5.6	3.6	2.1	5.7	5.2	2.6	1.5
Arizona pocket mouse	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cave myotis	15.9	3.7	0.5	2.5	12.3	5.6	3.6	2.1	5.7	5.2	2.7	1.1
Colorado River cotton rat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	2.5	1.7
Desert bighorn sheep	7.6	3.7	0.0	2.5	0.0	5.7	0.0	0.9	0.0	0.0	0.0	0.0
Greater Western mastiff bat	15.9	3.7	0.5	2.5	12.2	5.6	3.6	2.1	5.7	5.2	2.6	1.3
Harquahala Southern pocket gopher	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Harris' antelope squirrel	15.9	3.7	0.5	2.5	12.3	5.6	3.6	2.1	5.7	5.2	2.7	1.6
Kit fox	15.9	3.7	0.5	2.5	12.3	5.6	3.6	2.1	5.7	5.2	2.7	1.4
Little pocket mouse	15.9	3.7	0.5	2.5	12.3	5.6	3.6	2.1	5.7	5.2	2.7	1.4
Mexican free-tailed bat	16.0	3.7	0.6	2.5	12.6	5.7	3.7	2.2	5.7	5.2	2.7	0.5
Pale Townsend's big-eared bat	16.0	3.7	0.6	2.5	12.4	5.7	3.7	2.1	5.7	5.2	2.7	1.6
Pocketed free-tailed bat	13.6	3.7	0.4	2.5	7.1	4.4	2.1	0.7	2.2	1.9	1.5	0.8
Spotted bat	4.1	0.0	0.2	0.2	7.2	2.3	2.1	1.7	4.1	3.8	1.6	1.3
Western red bat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Western yellow bat	16.0	3.7	0.6	2.5	12.4	5.7	3.7	2.1	5.7	4.3	2.7	0.0
Yuma myotis	15.9	3.7	0.5	2.5	12.3	5.6	3.6	2.1	5.7	5.2	2.7	1.7

[a]Geographic Area: EP&K = East Plains and Kofa Zone, QTZ = Quartzsite Zone, CB = Copper Bottom Zone, CR&CA – Colorado River and California Zone

Amphibians and Reptiles

The only special status amphibian that is likely to be present in or near the Project Area in Arizona is the Sonoran desert toad. The toad had been found throughout most mid- to low-elevation areas throughout the Project Area in Arizona, even far from water, but this species is now rare or absent from much of the Colorado River Valley (Brennan and Holycross 2006).

Six special status reptiles, including two turtles, two lizards, and two snakes, could be present in or near the Project Area in Arizona. Sonora mud turtles (*Kinosternon sonoriense sonoriense*) likely are found near the Project Area only along the Colorado River, and they are now rare in that area (Brennan and Holycross 2006).

Sonoran desert tortoises are found in southwestern Arizona, primarily in the Arizona Upland subdivision on rocky slopes, canyons, bajadas, and other rugged terrain. They are less common or absent from valley bottoms dominated by creosote-bursage. Sonoran desert tortoises are managed in accordance with the Candidate Conservation Agreement for the Sonoran Desert Tortoise in Arizona (USFWS 2015). Habitat for the Sonoran desert tortoise on land managed by the BLM has been mapped and classified into three categories (BLM 2008c, Map 3-11) (Appendix 1, Figure 3.5-8):

- **Category 1**: Habitat area essential to maintenance of large, viable populations, where conflicts are resolvable; there are medium- to high-density or low-density populations contiguous with medium- or high-density populations and increasing, stable, or decreasing population.
- **Category 2**: Habitat area may be essential to maintenance of viable population, where most conflicts are resolvable; there are medium- to high-density or low-density populations contiguous with medium- or high-density populations and stable or decreasing population.
- **Category 3**: Habitat area not essential to maintenance of viable populations, where most conflicts are not resolvable; there are low- to medium-density populations not contiguous with medium- or high-density populations and stable or decreasing population.

The route segments located on land managed by the BLM do not cross any Category 1 Sonoran desert tortoise habitat. The East Plains and Kofa Zone is dominated by Sonoran desertscrub vegetation, providing habitat crossing the Harquahala and Ranegras plains; passing through foothills and bajadas north of the Eagletail Mountains; crossing sections of the Bighorn, Plomosa, and New Water mountains; and skirting the edge of the Livingstone Hills. Within the Copper Bottom Zone, Project segments pass through Sonoran desert tortoise habitat in the Dome Rock Mountains. All Project alternatives pass through Sonoran desert tortoise habitat and the quality of that habitat improves where alternatives are closer to the mountains (i.e., BLM category 2 habitat). The only Category 2 habitat crossed by the Project is in the Ranegras Plain and in the Plomosa Mountains just north of I-10. Route segments cross Category 3 habitat in the Harquahala Plain at the southern end of the Big Horn Mountains, in the Ranegras Plain at the southern end of the Little Harquahala Mountains, in the La Posa Plain west of Quartzsite, and throughout the Dome Rock Mountains. Route segments through the Kofa NWR cross good-quality Sonoran desert tortoise habitat in the New Water Mountains and Livingston Hills, but habitat on the refuge has not been classified based on BLM rankings. Segment p-06 crosses areas on the refuge that has a habitat potential index as high as 0.8 (Nussear et al. 2009) (Appendix 1, Figure 3.5-8). Table 3.5-17 provides the distance of Sonoran desert tortoise habitat crossed by route segments.

Table 3.5-17 Sonoran Desert Tortoise Habitat Intersected by Route Segments

SEGMENT	DISTANCE (MILES) OF INTERSECTED SONORAN DESERT TORTOISE HABITAT	
	CATEGORY 2	CATEGORY 3
East Plains and Kofa Zone [A]		
i-03	-	4.2
i-04	4.2	-
in-01	9.5	-
p-01	-	6.7
p-04	-	-
p-05	0.8	-
p-06	Not mapped [A]	Not mapped [A]
x-03	-	-
x-04	-	-
Alt. SCS Dist. Line	2.8	-
Quartzsite Zone		
p-09	-	2.6
x-05	-	-
qs-02	-	1.4
qn-02	-	2.9
Copper Bottom Zone		
cb-01	-	3.2
cb-02	-	2.2
cb-03	-	4.3
cb-04	-	1.9
cb-05	-	1.7
cb-06	-	1.9
i-06	-	7.1
i-07	-	1.0
x-08	-	1.3
p-10	-	1.1
p-11	-	4.0

SEGMENT	DISTANCE (MILES) OF INTERSECTED SONORAN DESERT TORTOISE HABITAT	
	CATEGORY 2	CATEGORY 3
p-12	-	2.7
p-13	-	0.3

[A] Sonoran desert tortoise habitat in the Kofa NWR is not mapped. Good-quality habitat is along parts of this route in the New Water Mountains and Livingston Hills.

Gila monsters are found in suitable habitat throughout the Project Area. The biological study area in Arizona has no suitable sand-dune habitat for the Mojave fringe-toed lizard (AGFD Natural Heritage Program n.d.; Brennan and Holycross 2006); the closest known population is at the Cibola Dunes, east of the Colorado River and more than 2 miles south of the Proposed Action route (Weinstein et al. 2003).

The desert rosy boa could be present in rocky areas in the western part of the Project Area, and Sonoran coral snakes could be present in or near the New Water and Plomosa mountains and possibly elsewhere in the Project Area (AGFD Natural Heritage Program n.d.).

Fish

The only special status fish species that could be present in the area are the razorback sucker and the bonytail chub, which are classified as endangered species and are described above.

Birds

At least 36 special status bird species, in addition to the threatened and endangered birds described above, could be present in or near the Project Area. Seven of those species are waterfowl, egrets and herons, rails, and other water birds commonly found in the Project Area only along and near the Colorado River. Seven other species are also likely to be found only along or near the river but are considered uncommon or absent from the area surrounding the proposed crossings of the river: Arizona Bell's vireo, marsh wren (*Cistothorus palustris*), mountain plover, Savannah sparrow, Sprague's pipit, and thick-billed kingbird (AGFD Natural Heritage Program n.d.).

At least eight eagles, hawks, and owls classified as special status species in Arizona could be present in the Project Area. Three of those raptors are known to nest in the area. Burrowing owls nest primarily in valley bottoms in and around farmland at the eastern and western ends of the Project Area (AGFD 2016a). Peregrine falcons and golden eagles nest in the region in mountainous areas with cliffs and other large rock outcrops. Golden eagle nest locations are widely scattered across the region in Arizona (Appendix 1, Figure 3.5-9) and have been documented nesting in the New Water, Eagletail, and Plomosa mountains, and potential nest sites have been identified elsewhere near the Project Area (G. Ritter, AGFD, personal communication. February 10, 2016). No known nest sites are within 1 mile of Project segments; the entire study area is considered potential foraging habitat.

Upland birds classified as special status species include: Abert's towhee, Le Conte's thrasher, and Lincoln's sparrow. These birds are found primarily on lower-elevation slopes or in valley bottoms with large washes or areas with moderate to dense shrubs in parts of the Harquahala and Ranegras plains. Brown-crested flycatchers (*Myiarchus tyrannulus*), desert purple martin, Costa's hummingbirds (*Calype costae*), elf owls, Gila woodpeckers, and gilded flickers are most abundant in the Arizona Upland subdivision, and primarily in areas with dense stands of saguaro cacti such as near Segment p-06 in the New Water Mountains and Livingston Hills, and along small sections of all route segments through the Dome Rock Mountains. Other special status birds are winter residents such as Brewer's sparrow (*Spizella breweri),* sage sparrow (*Amphispiza belli)*, and sage thrasher (*Oreoscoptes montanus*).

<u>Mammals</u>

At least 21 special status mammal species are present in or near the Project Area. Thirteen of these are bats, all of which are classified as a SGCN by the AGFD. Many of these bats depend on caves, mines, and rock crevices for day and night roosts, and most feed along or near washes and water sources (Weinstein et al. 2003).

Two mammals—beaver and Colorado River cotton rat—are restricted to within and near the Colorado River. Four other rodents—Arizona pocket mouse, Harquahala southern pocket gopher (*Thomomys bottae subsimilis*), Harris' antelope squirrel (*Ammospermophilus harrisii*), and little pocket mouse (*Perognathus longimembris*)—are common in suitable habitat in all or part of the Project Area in Arizona. Kit fox also are found in suitable lower-elevation habitat throughout the area, and populations of desert bighorn sheep are present in all mountain ranges in and near the Project Area (AGFD 2016a).

Other Special Status Wildlife Species – California

Special status wildlife species (not including Federal ESA-listed species) that could be present in or near the Project Area in California (Table 3.5-18) were identified by searching the CDFW's Biogeographic Information and Observation System and Natural Diversity Database (CDFW 2016a), reviewing BLM land use plans (BLM 2002c, 2015a, 2016g), and reviewing analyses of other projects that have occurred in the area (BLM 2012b, 2014b; BLM and Riverside County Planning Department 2015; BLM and CPUC 2006; CPUC 2011). Seven animal species classified as threatened, endangered, or candidates by the CFGC are known to be present or could be present in the region. Of those, five are known or likely to be present along or near route segments. Four of those species—Mojave desert tortoise, razorback sucker, bonytail chub, and Yuma Ridgway's rail—are also protected under the Federal ESA and are described above. The other state-listed species likely to be present along or near the routes—Swainson's hawk and Townsend's big-eared bat—could forage at least occasionally in the area. Swainson's hawks were observed 1 to 10 miles northwest of the Blythe airport during surveys for a proposed solar plant (BLM 2012b, Appendix C). The other six species, all birds, are likely rare or absent along or near the route segments but could be present in suitable habitat in the surrounding region.

Table 3.5-18 Special Status Wildlife Species (not including Federal ESA-listed species) that Could Occur within or near the Biological Study Area in California

SPECIES		STATUS DESIGNATION (CALIFORNIA/BLM)	HABITAT	POTENTIAL PRESENCE IN PROJECT AREA
Amphibians				
Scaphiopus couchii	Couch's spadefoot	California: SSC BLM: Sensitive	Desert, arid, and semi-arid shrublands/chaparral, shortgrass plains, cropland/hedgerow, savanna. High potential to occur in and near ephemeral pools and agricultural areas in eastern portion of Project Area in California.	Moderate potential to occur
Incillius alvarius	Sonoran desert toad	California: SSC	Occurs in a variety of habitats including creosote bush desertscrub, grasslands, along major river corridors, and the edges of agriculture. Generally, within several miles of permanent or temporary water sources.	Not expected to occur
Reptiles (see Table 3.5-12 for federally listed reptiles)				
Uma scoparia	Mojave fringe-toed lizard	California: SSC BLM: Sensitive	Sparsely vegetated dunes, flats, riverbanks and washes with fine, loose sand. This species is common on sandy soils within the biological study area.	Present
Kinosternon sonoriense	Sonoran mud turtle	California: SSC	Usually found in rocky streams, creeks, and rivers. It also inhabits ponds, cattle tanks, and ditches. Within study area, rare along lower Colorado River.	Low potential to occur
Fish – None (see Table 3.5-12 for federally listed fish)				
Mammals				
Taxidea taxus	American badger	California: SSC	Agricultural land, grassland, and other open areas and brush lands with sparse groundcover. This species has been detected near the study area.	Present
Myotis occultus	Arizona myotis	California: SSC	Ponderosa pine and oak-pine woodland near water and wooded riparian areas in desert areas.	Low potential to occur
Macrotus californicus	California leaf-nosed bat	California: SSC BLM: Sensitive	Lowland desertscrub roosting in caves, abandoned mine tunnels and rock shelters in canyon walls.	Low potential to occur

SPECIES		STATUS DESIGNATION (CALIFORNIA/BLM)	HABITAT	POTENTIAL PRESENCE IN PROJECT AREA
Myotis velifer	Cave myotis	California: SSC BLM: Sensitive	Evergreen or pine-oak forest and pine forest at mid-high elevations and riparian habitats near desertscrub at lower elevations.	Low potential to occur
Sigmodon arizonae plenus	Colorado River cotton rat	California: SSC	Riparian thickets, dense grass cover, drier grassy areas. Likely rare or absent along Colorado River in study area.	Low potential to occur
Felis concolor brownii	Yuma mountain lion	California: SSC	From mountains to valley bottoms where prey is abundant. Absent or very rare in study area.	Low potential to occur
Ovis canadensis nelsoni	Desert bighorn sheep	California: FP BLM: Sensitive BLM: Focus Species	Canyons, hills, and mountains in rough terrain throughout the southwestern US. There is no habitat for this species within the study area.	Not expected to occur
Antrozous pallidus	Pallid bat	California: SSC BLM: Sensitive	Deserts and grasslands, mostly near rocky outcrops and water. Roosts in rock crevices.	Low potential to occur
Nyctinomops femorosaccus	Pocketed free-tailed bat	California: SSC	Rocky canyons with outcroppings and high cliffs. Roosts in rock crevices and caves. Observed near shrubland, mixed tropical deciduous forest, and floodplains with sycamore and mesquite with nearby high cliffs.	Low potential to occur
Corynorhinus townsendii	Townsend's big-eared bat	California: SSC BLM: Sensitive	Near the entrance of caves, mine tunnels, and other well-ventilated areas. Night roosts can include caves as well as buildings and tree cavities. Potential foraging habitat exists along the Colorado River and in adjacent agricultural fields, and it is likely that this species is present in the area at least occasionally.	Moderate potential to occur
Lasiurus xanthinus	Western yellow bat	California: SSC	Roosts in trees, including woodland and riparian habitat.	Moderate potential to occur
Myotis yumanensis	Yuma myotis	BLM: Sensitive	Riparian, desertscrub, moist woodlands, and forests, typically near open water.	Moderate potential to occur

SPECIES		STATUS DESIGNATION (CALIFORNIA/BLM)	HABITAT	POTENTIAL PRESENCE IN PROJECT AREA
Birds (see Table 3.5-12 for federally listed birds)				
Vireo bellii arizonae	Arizona bell's vireo	California: Endangered BLM: Sensitive	Dense shrub vegetation in riparian areas, fields, woodlands, scrub oak, chaparral near water in arid regions. Could occur uncommonly within or near study area.	Not expected to occur
Toxostoma bendirei	Bendire's thrasher	California: SSC BLM: Sensitive BLM: Focus Species	Rare or uncommon during summer, dry and semi-arid washes and other areas containing shrubs, trees, and especially yucca. Unlikely to occur in study area.	Low potential to occur
Athene cunicularia	Burrowing owl	California: SSC BLM: Sensitive BLM: Focus Species	Open grasslands, savannas and plains. Occasionally in vacant lots. This species has been detected within the study area.	Present
Laterallus jamaicensis coturniculus	California black rail	California: Threatened, Fully Protected BLM: Focus Species	Marshlands and very wet meadows. Rarely seen away from dense reeds, rushes, cordgrass, cattails and other emergent vegetation. Within Project Area, restricted to Colorado River.	Moderate potential to occur
Toxostoma crissale	Crissal thrasher	California: SSC	Microphyll woodland and riparian washes, mesquite woodlands, other dense scrub vegetation. Uncommon year-round resident in region.	Low potential to occur
Micrathene whitneyi	Elf owl	California: Endangered BLM: Sensitive	Riparian forests, desert, woodlands. No suitable habitat along California route segments, but could be present uncommonly in the surrounding area.	Low potential to occur
Melanerpes uropygialis	Gila woodpecker	California: Endangered BLM: Sensitive BLM: Focus Species	Arid lowland scrub, second-growth and montane scrub, deciduous forests, riparian woodlands. There is very little or no habitat for this species in the study area.	Low potential to occur

SPECIES		STATUS DESIGNATION (CALIFORNIA/BLM)	HABITAT	POTENTIAL PRESENCE IN PROJECT AREA
Colaptes chrysoides	Gilded flicker	California: Endangered BLM: Sensitive	Saguaro cactus or Joshua tree stands, riparian areas lined with cottonwood and willows in desert lowlands and foothills. There is very little or no habitat for this species in the study area.	Low potential to occur
Aquila chrysaetos	Golden eagle	California: Fully Protected Eagle Protection Act BLM: Sensitive BLM: Focus Species	Open areas, plains, and mountains throughout North America. This species is not known to nest or forage in the vicinity of the study area in California, and the Palo Verde Mesa offers low prey availability.	Low potential to occur
Grus canadensis tabida	Greater sandhill crane	California: Threatened, Fully Protected BLM: Sensitive	Overwinters in agricultural fields and irrigated pastures and nearby shallow-water wetlands for roosting. Sandhill cranes, including possibly this subspecies, have been observed uncommonly in agricultural fields near Blythe.	Moderate potential to occur
Toxostoma lecontei	Le Conte's thrasher	California: SSC	Vegetated washes and desertscrub with saltbush, shadscale, cholla cacti, or other species suitable for nesting. This species has been detected within or near the study area.	Present
Asio otus	Long-eared owl	California: SSC	Uncommon to rare year-round resident in riparian and desert woodlands throughout deserts of southern California. There are no stands or riparian trees or large desert woodlands within the study area that would be suitable habitat for this species.	Not expected to occur
Lanius ludovicianus	Loggerhead shrike	California: SSC	Year-round resident in open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches. This species has been detected in or near the study area.	Present
Charadrius montanus	Mountain plover	California: SSC BLM Sensitive	Winters in and near cultivated fields along lower Colorado River. Could occur uncommonly within and near cultivated fields.	Moderate potential to occur
Circus cyaneus	Northern harrier	California: SSC	Grasslands, flat areas, and hills with open habitat. This species has been detected within or near the study area.	Present

SPECIES		STATUS DESIGNATION (CALIFORNIA/BLM)	HABITAT	POTENTIAL PRESENCE IN PROJECT AREA
Asio flammeus	Short-eared owl	California: SSC	Rare in open areas, fields, and wetlands. Unlikely to occur in study area.	Not expected to occur
Setophaga petechia sonorana	Sonora yellow warbler	California: SSC	Cottonwood, willow, and salt cedar riparian woodlands. Limited habitat within the study area.	Low potential to occur
Piranga rubra	Summer tanager	California: SSC	Summer resident in mature cottonwood riparian woodlands along Colorado River. Limited or no habitat within and near study area.	Low potential to occur
Buteo swainsoni	Swainson's hawk	California: Threatened BLM: Sensitive BLM: Focus Species	Plains and hills with open vegetation. This species is not expected to nest within or near the study area.	Low potential to occur
Pyrocephalus rubinus	Vermilion flycatcher	California: SSC	Cropland, cultivated lands, desert, shrubland, riparian woodlands near water. Could occur uncommonly near cultivated fields.	Moderate potential to occur
Icteria virens	Yellow-breasted chat	California: SSC	Summer resident in dense, early successional riparian woodlands and thickets with willows, salt cedar, vine tangles, and dense brush with well-developed understories and some overstory for perches.	Low potential to occur
Xanthocephalus xanthocephalus	Yellow-headed blackbird	California: SSC	Freshwater wetlands with open water and dense, emergent vegetation. Foraging in fields and open cultivated areas. Could occur uncommonly along Colorado river and among agricultural fields.	Moderate potential to occur
Rallus obsoletus yumanensis	Yuma Ridgway's rail	California: Threatened BLM: Focus Species	Freshwater marshes with stands of bulrushes and cattails. Known to be present in wetlands in canals and drains adjacent to cultivated fields.	Moderate potential to occur
Invertebrates – None				

Notes: BLM = Bureau of Land Management; FP = Fully Protected; SSC = Species of Special Concern
BLM Focus species as designated under the DRECP LUPA

The distance of potential habitat of special status animal species that is crossed by each route segment is listed in Tables 3.5-19 and 3.5-20. Habitat models and associated maps developed for the DRECP (BLM 2016h) were used to calculate the data in Table 3.5-19 and Table 3.5-20. The tables only contain data for those special status species for which data were available in the DRECP database. The distribution of potential habitat for each species is based on habitat models and could contain areas that are not used by or suitable for a species.

Table 3.5-19 Length of Special Status Wildlife Species Habitat Intersected by the Proposed Action Route Segments in California, in Miles, Based on DRECP Habitat Models

SPECIES HABITAT	PROPOSED ACTION SEGMENT			
	P-15W	P-16	P-17	P-18
Couch's spadefoot toad	6.6	4.7	3.0	2.4
Mojave fringe-toed lizard	0.0	2.7	3.0	2.4
Arizona Bell's vireo	0.0	0.0	0.0	0.0
Bendire's thrasher	0.0	0.0	0.1	2.4
Burrowing owl	6.6	4.7	1.9	0.0
California black rail	1.2	0.0	0.0	0.0
Elf owl	6.1	0.0	0.0	0.0
Gila woodpecker	0.0	0.0	0.0	0.0
Golden eagle	0.0	0.2	1.9	0.0
Greater sandhill crane	6.6	4.7	2.9	0.0
Le Conte's thrasher	0.0	2.7	3.0	2.4
Long-eared owl	6.6	4.7	3.0	2.4
Southwestern willow flycatcher	1.2	0.	0.0	0.0
Western yellow-billed cuckoo	6.1	0.0	0.0	0.0
Yuma Ridgway's rail	1.2	0.0	0.0	0.0
American badger	6.6	4.7	3.0	2.4
Desert bighorn sheep	0.0	0.2	1.9	0.0
California leaf-nosed bat	0.0	2.7	3.0	2.4
Desert kit fox	0.0	2.7	3.0	2.4
Mule deer	0.0	2.7	3.0	2.4
Pallid bat	0.0	2.7	3.0	2.4
Townsend's big-eared bat	0.0	2.7	3.0	2.4

Table 3.5-20 Length of Special Status Wildlife Species Habitat Intersected by Alternative Route Segments in California, in Miles, Based on DRECP Habitat Models

SPECIES HABITAT	ALTERNATIVE ROUTE SEGMENT													
	X-09	X-10	X-11	X-12	X-13	X-15	X-16	CA-01	CA-02	CA-04	CA-05	CA-06	CA-07	CA-09
Couch's spadefoot toad	0.5	1.4	1.4	2.1	1.3	2.2	1.7	2.1	3.6	3.5	0.8	6.6	2.6	1.4
Mojave fringe-toed lizard	0.0	0.00	1.4	0.8	1.3	2.2	1.7	0.0	0.5	3.5	0.0	0.6	2.6	1.4
Arizona Bell's vireo	0.5	1.4	0.0	0.0	0.0	0.0	0.0	1.2	1.1	0.0	0.8	1.1	0.0	0.0
Bendire's thrasher	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Burrowing owl	0.5	1.4	1.4	2.1	1.3	2.2	1.5	2.1	3.6	0.9	0.8	6.6	2.6	0.1
California black rail	0.5	1.4	0.0	0.0	0.0	0.0	0.0	2.1	3.6	0.0	0.8	3.5	0.0	0.0
Elf owl	0.5	1.4	1.4	0.8	0.0	0.0	0.0	2.1	3.6	0.0	0.8	6.6	1.9	0.0
Gila woodpecker	0.5	1.4	0.0	0.0	0.0	0.0	0.0	1.2	1.1	0.0	0.8	1.1	0.0	0.0
Golden eagle	0.0	0.0	0.0	0.0	0.9	0.4	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Greater sandhill crane	0.5	1.4	1.4	2.1	1.3	2.2	1.7	2.1	3.6	3.4	0.8	6.6	2.6	1.4
Le Conte's thrasher	0.5	0.0	1.4	0.8	1.3	2.2	1.7	0.0	0.5	3.5	0.8	0.6	2.6	1.4
Long-eared owl	0.5	1.4	1.4	2.1	1.3	2.2	1.7	2.1	3.6	3.5	0.8	6.6	2.6	1.4
Southwestern willow flycatcher	0.5	1.4	0.0	0.0	0.0	0.0	0.0	2.1	1.1	0.0	0.8	1.1	0.0	0.0
Western yellow-billed cuckoo	0.5	1.4	0.0	0.0	0.0	0.0	0.0	2.1	3.6	0.0	0.8	6.0	0.0	0.0
Yuma Ridgway's rail	0.5	1.4	0.0	0.0	0.0	0.0	0.0	2.1	1.1	0.0	0.8	1.1	0.0	0.0

SPECIES HABITAT	ALTERNATIVE ROUTE SEGMENT													
	X-09	X-10	X-11	X-12	X-13	X-15	X-16	CA-01	CA-02	CA-04	CA-05	CA-06	CA-07	CA-09
American badger	0.5	1.4	1.4	2.1	1.3	2.2	1.7	2.1	3.6	3.5	0.8	6.6	2.6	1.4
Desert bighorn sheep	0.0	0.0	0.0	0.0	0.0	0.4	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
California leaf-nosed bat	0.0	0.0	0.0	0.0	1.3	2.2	1.7	0.0	0.0	3.5	0.0	0.0	0.7	1.4
Desert kit fox	0.0	0.0	0.0	0.0	1.3	2.2	1.7	0.0	0.0	3.5	0.0	0.0	0.7	1.4
Mule deer	0.0	0.0	1.4	0.8	1.3	2.2	1.7	0.0	0.5	3.5	0.0	0.6	2.6	1.4
Pallid bat	0.0	0.0	0.0	0.0	1.3	2.2	1.7	0.0	0.0	3.5	0.0	0.0	0.7	1.4
Townsend's big-eared bat	0.0	0.0	0.0	0.0	1.3	2.2	1.7	0.0	0.0	3.5	0.0	0.0	0.7	1.4

Invertebrates

No special status invertebrates have been documented in the CDFW's Biogeographic Information and Observation System and Natural Diversity Database or applicable impact assessments as occurring within the biological study area. Two invertebrates, the Riverside cuckoo wasp (*Hedychridium argenteum*) and Bradley's cuckoo wasp (*Ceratochrysis bradleyi*), with a global and state ranking of critically imperiled, have been found 6 to 18 miles north of Blythe (BLM 2012b, Appendix C).

Amphibians and Reptiles

The only special status amphibian that would be present on the Palo Verde Valley is the Couch's spadefoot toad (BLM 2002c, Appendix N). It is found in a variety of vegetation associations, including desert dry wash woodland and creosote bush scrub, in areas where there is loose soil for digging and temporary ponds or standing water after summer storms. Couch's spadefoot toad has recently been sighted during construction of other nearby projects including the DPV1 transmission line and the Genesis solar facility. The Sonoran Desert toad has some potential to occur in the Colorado River corridor and irrigation canals/drainages, but this species is now rare or absent from much of the Colorado River Valley (Brennan and Holycross 2006)

Two special status reptiles, in addition to the Mojave desert tortoise, are present in or near the study area. Sonora mud turtles likely had been found near the Project Area only along the Colorado River and are now rare or absent from that area (Brennan and Holycross 2006). Mojave fringe-toed lizards are common in the sand dunes and other sandy soils on the Palo Verde Mesa (BLM 2012b, Appendix C; BLM and Riverside County Planning Department 2015, Appendix C1).

Fish

The only special status fish species that could be present in the area are the razorback sucker and the bonytail chub. These species are classified as endangered under the Federal and California ESAs and are described in the Federal ESA section.

Birds

In addition to the three bird species classified as threatened or endangered under the Federal ESA discussed above, 21 special status birds are present or could be present in or near the Project Area.

Nine birds classified as threatened or endangered under the California ESA are present or could be present in the region. Two of those species, Yuma Ridgway's rail and Swainson's hawk, have been observed in or near the biological study area, and greater sandhill crane could forage in agricultural fields during winter. Swainson's hawks have been observed northwest of the Blythe airport (BLM 2012b, Appendix C), which forage in open grasslands, shrublands, woodlands, and cultivated fields. They migrate through the lower Colorado River valley and are most likely to be found in or near cultivated fields. The nearest Swainson's hawk nesting areas are more than 150 miles to the northwest in Antelope Valley (BLM 2015a, Section III.7). Greater sandhill cranes overwinter near the Salton Sea and elsewhere in the Imperial Valley, and have been observed infrequently along the Colorado River near Blythe (BLM 2015a, Appendix Q).

Little or no suitable habitat for the other state-listed bird species is along or adjacent to route segments in California, but these species could be present in the surrounding biological study area or elsewhere in the region. For example, Gila woodpeckers and gilded flickers have been observed along the lower Colorado River, primarily in riparian forests and stands of saguaro cacti (BLM 2015a; LCRMSCP 2016). These species nest in columnar cacti and trees with large trunks, and suitable habitat in the region includes cotton-willow riparian woodlands, paloverde-cacti-mixed scrub vegetation communities with large saguaro cacti, and xeroriparian wash woodlands with large overstory trees. No riparian habitat for these species is at any of the proposed river crossings, and the wash woodlands that would be crossed by route segments have a sparse overstory of small trees. Thus, it is unlikely that Gila woodpeckers or gilded flickers are present along route segments, but they could be present elsewhere in the biological study area.

Similarly, the other state-listed birds present in the region—elf owl, southwestern willow flycatcher, and western yellow billed cuckoo—use riparian woodlands, dense riparian vegetation, or areas with well-developed stands of saguaro or Joshua trees (*Yucca brevifolia*) that are not present near the route segments but are present elsewhere along the Colorado River south of Blythe and in the surrounding region (BLM 2015a; LCRMSCP 2016).

Of the other special status bird species that could be present in or near the Project Area, five have been documented between Blythe and the Colorado River Substation: burrowing owls, golden eagles (potential nests within 10 miles), Le Conte's thrasher, loggerhead shrike (*Lanius ludovicianus*), and northern harrier (*Circus cyaneus*) (BLM 2012b; BLM and Riverside County Planning Department 2015). There is no nesting habitat for the golden eagle within the Project Area, and the closest potentially suitable nesting location would be in the Mule Mountains, about 1 mile southwest of the Proposed Action segments. Numerous eagle nest surveys have been conducted in the general vicinity for other projects; while nesting has not been documented in the Mule Mountains, there is an historic eagle nest within 10 miles. The Project Area may provide eagle foraging habitat, but the prey base of black-tailed jackrabbits and desert cottontails is considered very low (Longshore et al. 2017). An assessment of eagle prey availability on the Palo Verde Mesa (Ironwood Consulting 2016) estimated 0.0035 jackrabbits per acre.

The Desert Quartzite Solar project conducted extensive protocol level surveys for burrowing owls between 2012 and 2015. Up to four active burrows were documented over this time frame (Ironwood Consulting 2016), confirming that burrowing owl densities are very low across Palo Verde Mesa. It is possible that Arizona Bell's vireo, mountain plover, vermilion flycatcher, and yellow-headed blackbird are also present at least infrequently in the Project Area (BLM 2012b). The remaining species are very uncommon in the region or are restricted to riparian or other habitat that is not found near the route segments (Shuford and Gardali 2008).

Mammals

At least 13 special status mammals are present or could be present in or near the Project Area. One of these species, Townsend's big-eared bat, is a candidate for listing as threatened under the California ESA. This species is known to be present in the lower Colorado River basin (BLM 2015a, Section III.7; CDFW 2016e). These bats roost most often in caves and mines but also have been found roosting in buildings, bridges, and other structures. The only known roosting colony in the lower Colorado River area is in the Riverside Mountains more than 25 miles north of Blythe, and all known historic and recent roosts are in mines (Brown 2013; CDFW 2016e). It is possible that this species forages infrequently along the Colorado River and elsewhere in or near the Project Area.

At least seven other special status bats could be present in the Project Area, and are most likely to be found foraging along the river or over cultivated fields. No mines, caves, or cliffs are present in the biological study area in California, but there are bat colonies in the Mule Mountains south of the study area, including a maternity roost for the California leaf-nosed bat (BLM 2016a, Appendix B, p. 189).

American badgers and desert kit foxes have been documented in or near the Project Area (BLM 2012b) and are likely to be present along route segments.

Colorado River cotton rats have been found along the Colorado River south of Blythe. They are most common in marshes, wetlands, and other mesic sites with grass and cattails but have also been found along canals and irrigated fields and in arid scrub (Collins 1998; LCRMSCP 2016). Little or no suitable marsh habitat for this species is present at any of the proposed river crossings, but Colorado River cotton rats could be present in adjacent irrigated fields or elsewhere in the Project Area in suitable habitat.

The nearest population of desert bighorn sheep in California is in the Mule Mountains more than 2 miles south of route segments. Mountain lions are rare or absent from the low-elevation and partially developed land within the Project Area in California.

Wildlife Corridors

Several route segments cross areas designated by the BLM YFO RMP as the Wildlife Movement Corridor WHMA in the La Posa Plain south of Quartzsite between the Livingston Hills and Dome Rock Mountains, and also along where I-10 crosses the Plomosa and Dome Rock mountains. This WHMA is managed to maintain functional habitats through landscape connectivity and reduced habitat fragmentation to support species and provide movement corridors for big game between and within mountain ranges. Additional desired future conditions include reducing fragmentation and limiting additional human-caused disturbances and land-cover changes that may adversely affect native wildlife species habitats (BLM 2010b, Section 2.7.2). Applicable management actions include:

- Minimizing new developments within the WHMA that will impede or inhibit wildlife movements
- When impacts within the WHMA are unavoidable, allow no net loss or no net impact to occur so that the ecosystem composition, structure, functions, and processes are maintained
- Additional uses in the WHMA will be limited to compatible activities and those actions whose impacts could be mitigated to preserve or enhance wildlife values
- Transmission-class rights-of-way within the WHMA will be confined to designated right-of-way corridors whenever practicable

In California, an identified 5-mile-wide wildlife movement corridor centered on Wiley's Well Road provides linkage across I-10 between the Mule and McCoy mountains. The Colorado River corridor is an important migratory pathway for birds as well as providing a movement corridor for terrestrial wildlife.

Wildlife Habitat Management Areas

Route segments cross or are near numerous areas designated by various BLM Land Use Plans as WHMAs (Appendix 1, Figure 3.5-10; Table 3.5-21). No WHMAs exist in the portion of the biological study area that crosses land managed under the BLM Lower Sonoran RMP (BLM 2012a). In addition, the route segments in California do not cross any areas designated under the DRECP (BLM 2016a) or other applicable BLM management plans (BLM 1980, 2002b) as areas for the conservation or focused management of biological resources. All areas on BLM-managed lands in California that are crossed by the route segments are classified in the DRECP as Development Focus Areas (DFAs).

Table 3.5-21 Length of Wildlife Habitat Management Areas Crossed by Route Segments

WILDLIFE HABITAT MANAGEMENT AREA	ZONE	SEGMENT	LENGTH (MILES)
Belmont/Big Horn Mountains	East Plains and Kofa	p-01	2.8
Havasu Habitat Management Area	East Plains and Kofa	in-01	7.5
		Alt. SCS Dist. Line	2.8
Palomas Plain	East Plains and Kofa	d-01	7.4
		i-01	8.4
		i-02	3.3
		i-03	8.7
		p-01	0.4
		p-02	1.2
		p-03	2.1
		p-04	5.5
		p-05	2.0
		p-06	10.3
		x-01	7.9
		x-02	6.7
		x-03	5.6
		x-04	10.8
Wildlife Movement Corridors	East Plains and Kofa	i-04	2.8
		in-01	1.2
		p-06	0.4
	Quartzsite	p-07	2.1
		p-08	0.7
		p-09	3.9
		x-05	3.7
		x-06	4.0
		x-07	3.5
	Copper Bottom	i-06	1.3
		i-07	0.2
		x-08	0.8

WILDLIFE HABITAT MANAGEMENT AREA	ZONE	SEGMENT	LENGTH (MILES)
Desert Mountains	East Plains and Kofa	d-01	4.2
		i-03	3.0
		i-04	8.3
		in-01	1.9
		p-04	2.1
		p-05	1.1
		x-04	1.7
	Quartzsite	p-08	0.4
		p-09	5.9
		qn-02	1.7
		qs-02	0.2
		x-05	2.4
		x-07	0.3
	Copper Bottom	cb-01	3.2
		cb-02	2.2
		cb-03	2.4
		cb-04	1.0
		cb-05	1.1
		i-06	4.0
		p-10	1.1
		p-11	4.0
		p-12	1.0
Lower Colorado and Gila River Riparian Area	Copper Bottom	cb-10	0.7
		p-15e	0.8
	Colorado River and California	ca-04	0.3
		i-08s	0.2
		p-15w	0.1
		x-11	0.1

Belmont/Bighorn Mountains WHMA

Route segments cross the Belmont/Bighorn Mountains WHMA north of Burnt Mountain, which is designated under the Bradshaw-Harquahala RMP administered by the BLM Hassayampa Field Office. The desired future condition for this WHMA is:

> Restore, enhance, and maintain the wildlife, plant diversity, and species richness of the Sonoran Desertscrub vegetation community in the Belmont/Big Horn Mountains Wildlife Habitat Area. Maintain unfragmented wildlife habitat to provide adequate forage, cover, and access to water for healthy wildlife populations. Conserving and managing for healthy wildlife populations are priorities in managing the area. (BLM 2010c, Section 2.7.1.1)

Management actions identified for this WHMA include mitigating impacts of vehicle routes that conflict with maintaining wildlife habitat value (for example, relocating route segments and limiting seasonal or time-of-day use) and mitigating development to minimize impacts on priority wildlife species so as to ensure achieving the desired future conditions (BLM 2010c, Section 2.7.1.3).

Havasu WHMA

Segment in-01 crosses the southern edge of the Havasu WHMA that encompasses much of the Plomosa Mountains north of I-10. This WHMA is designated by the Lake Havasu RMP administered by the BLM Lake Havasu Field Office. The WHMA was established for the management of desert bighorn sheep and Sonoran desert tortoise habitat (BLM 2007, pp. 18–20). A portion of this WHMA just north of I-10 in the Plomosa Mountains also is sensitive desert bighorn sheep habitat (BLM 2007, Map 10).

The RMP establishing this WHMA states that new development will be compatible with wildlife habitat to the extent possible to preserve, maintain, and/or enhance plant and wildlife diversity. It also requires that uses in conflict with restoration and/or maintenance of threatened and endangered species habitats will be restricted as determined by the NEPA process (BLM 2007, pp. 18 and 22).

Colorado and Gila River Riparian WHMA

The route segment crossings (Segments p-15e, cb-10, i-08s, and ca-04) of the Colorado River cross this WHMA, which includes riparian areas along the river. This WHMA is designated by the YFO RMP (BLM 2010b) and administered by the YFO.

Desired future conditions for this WHMA include reducing fragmentation and limiting additional human-caused disturbances and land-cover changes that may adversely affect native fish and wildlife species habitats (BLM 2010b, Section 2.7.2). In addition, desired future conditions include protection and maintenance of riparian habitat to retain biological diversity and enhance potential habitat to support neotropical migratory birds, special status species, and other wildlife. Applicable management actions include:

- When impacts within the WHMA are unavoidable, allow no net loss or no net impact to occur so that the ecosystem composition, structure, functions, and processes are maintained.
- Additional uses in the WHMA will be limited to compatible activities and those actions whose impacts could be mitigated to preserve or enhance wildlife values.
- Transmission-class rights-of-way within the WHMA will be confined to designated right-of-way corridors whenever practicable.

Desert Mountains WHMA

The route segments cross the Desert Mountains WHMA in the Eagletail, New Water, Plomosa, and Dome Rock mountains. This WHMA is designated by the YFO RMP and administered by the BLM YFO.

Desired future conditions for this WHMA include reducing fragmentation and limiting additional human-caused disturbances and land-cover changes that may adversely affect native fish and wildlife species habitats (BLM 2010b, Section 2.7.2). In addition, desired future conditions include maintaining well-distributed habitats and connective corridors to support self-sustaining populations of native wildlife species, including desert bighorn sheep and Sonoran desert tortoises. In these areas, roads traversing desert bighorn sheep habitat may be closed, limited, or rerouted during the lambing season. Applicable management actions include:

- When impacts within the WHMA are unavoidable, allow no net loss or no net impact to occur so that the ecosystem composition, structure, functions, and processes are maintained.
- Additional uses in the WHMA will be limited to compatible activities and those actions whose impacts could be mitigated to preserve or enhance wildlife values.
- Transmission-class rights-of-way within the WHMA will be confined to designated right-of-way corridors whenever practicable.

Palomas Plain WHMA
The route segments in the Harquahala and Ranegras plains cross this WHMA, which is managed to maintain unfragmented, functional landscapes with habitat and corridors to support native wildlife populations, including Sonoran pronghorn and mule deer. The WHMA is designated by the YFO RMP and administered by the BLM YFO. Additional desired future conditions include reducing fragmentation and limiting additional human-caused disturbances and land-cover changes that may adversely affect native fish and wildlife species habitats (BLM 2010b, Section 2.7.2). Management actions in this WHMA include:

- Concentrating developments such as utility facilities in areas that are already developed or disturbed.
- When impacts within the WHMA are unavoidable, allow no net loss or no net impact to occur so that the ecosystem composition, structure, functions, and processes are maintained.
- Additional uses in the WHMA will be limited to compatible activities and those actions whose impacts could be mitigated to preserve or enhance wildlife values.
- Transmission-class rights-of-way within the WHMA will be confined to designated right-of-way corridors whenever practicable.

<u>Migratory Birds</u>

Over 800 species of birds are protected under the MBTA (a complete list of the protected bird species can be obtained from the USFWS website http://www.fws.gov/migratorybirds/intrnltr/mbta/mbtandx.html), and it is unlawful to take, possess, or destroy the nest or eggs of any such bird. Throughout the Project Area are numerous habitats that could be used for nesting by a wide range of protected migratory birds, including Sonoran desert vegetation communities, riparian corridor of the Colorado River, natural rock features such as cliffs and large rock outcrops associated with mountains, agricultural areas, irrigation canals and drains, and ornamental and landscaped vegetation. The Colorado River serves as a movement corridor and migratory pathway for birds. Desert washes are important migratory bird habitat, and the dense vegetation provides thermal cover. Raptors may use transmission structures for nest or perch sites, where the birds may be exposed to potential electrocution. Generally, nesting would peak during the spring, but could begin as early as January and extend through the summer. There is the potential for protected birds to nest along every route segment.

Zone-Specific Conditions

East Plains and Kofa Zone

The Project segments primarily cross valley bottoms and other lower-elevation areas in the Lower Colorado River Valley subdivision of the Sonoran Desert. Segment p-06 crosses about 22 miles of Arizona Uplands subdivision with diverse stands of cacti and upland vegetation and passes through and near the Kofa NWR. The route segments along I-10 cross about 13 to 16 miles of Arizona Upland habitat.

Steep mountain slopes are important habitat for desert bighorn sheep (*Ovis canadensis mexicana*), and cliffs provide nesting sites for numerous raptor species. These features are found throughout the Eagletail, New Water, and Plomosa mountains and throughout other mountain ranges in and surrounding the Project Area in this geographic area. There are no major human-caused barriers to wildlife movement south of I-10.

In the East Plains and Kofa Zone of the study area:

- There is one water source within 0.1 mile of Segment p-01, and a second water source within 0.3 mile of Segment p-06 on the Kofa NWR.
- The route segments cross numerous washes where there is a higher diversity of plants and animals than is found in surrounding areas.
- Route segments cross Category 2 habitat for the Sonoran desert tortoise in the Ranegras Plain (0.8 mile along Segment p-05) and in the Plomosa Mountains just north of I-10 (4.2 miles along Segment in-04) and south of I-10 (9.5 miles along Segment i-04). Route segments cross Category 3 habitat in the Harquahala Plain at the southern end of the Big Horn Mountains and in the Ranegras Plain at the southern end of the Little Harquahala Mountains. In addition, parts of the route segment through the Kofa NWR (Segment p-06) cross good-quality Sonoran desert tortoise habitat in the New Water Mountains and Livingston Hills.

Table 3.5-22 details the Sonoran pronghorn nonessential experimental population area that would be intersected by segments within the East Plains and Kofa Zone.

Table 3.5-22 Sonoran Pronghorn Nonessential Experimental Population Area Intersected by Segments in the East Plains and Kofa Zone

SEGMENT	LENGTH (TO NEAREST HALF-MILE)	COUNTY
d-01	25.0	La Paz, Maricopa
i-01	8.5	La Paz
i-02	3.5	La Paz
i-03	20.0	La Paz
i-04	10.5	La Paz
p-01	3.5	Maricopa
p-02	1.0	La Paz
p-03	2.0	La Paz
p-04	5.5	La Paz
p-05	2.0	La Paz
p-06	35.5	La Paz
x-01	8.0	La Paz
x-02	6.5	La Paz
x-03	5.5	La Paz
x-04	22.5	La Paz

A nonessential experimental population of Sonoran pronghorn (endangered) is being established in King Valley on the Kofa NWR. About 70 Sonoran pronghorn were released into King Valley on the Kofa NWR from 2013 through January 2016. Most of those animals have remained in that valley on the Kofa NWR and the YPG, more than 10 miles south of the route segments. About ten individuals have been found outside of the Kofa NWR west of US 95, and a small number of other individuals have moved outside of the Kofa NWR and into or through the Palomas Plain, the southern Ranegras Plain, and north of and near the Little Horn and Eagletail mountains (AGFD 2014, 2015, 2016b).

Potential route segments in the East Plains and Kofa Zone south of I-10 are within the experimental nonessential population area established for the Sonoran pronghorn. Though reintroductions are occurring in the King Valley on the Kofa NWR and most animals remain many miles from Project segments, some animals have moved long distances, possibly as far as the Harquahala Plain, and have repeatedly been documented within portions of the proposed ROW (USFWS 2017). As the number of animals increase through augmentation and reproduction, the range of the population would be expected to expand and perhaps regularly encounter portions of the Project.

According to the 2016 Revised Sonoran Pronghorn Recovery Plan (USFWS 2016a):

> "The Kofa population could be threatened by habitat loss, but most lands have some level of protection from habitat loss. Lands managed by FWS in the Kofa population area comprise 23% of the area, including Kofa NWR, Imperial NWR, and Cibola NWR. These FWS lands are managed for wildlife habitat and are primarily protected from habitat loss" (USFWS 2016a p. 37).

On the Cabeza Prieta NWR and in Sonora, Mexico, Sonoran pronghorn are present in open valley bottoms during cool and wetter months and in areas closer to dense vegetative cover during summer. Little has been written about the habitat use and movements of Sonoran pronghorn in the introduced population on and near the Kofa NWR.

Segments p-01 and p-04 cross an area near habitat for desert bighorn sheep in the Big Horn and Eagletail mountains, and Segment d-01 passes near bighorn habitat in the Eagletail Mountains. Segment p-01 also crosses an important wildlife dispersal corridor south of the Big Horn Mountains.

Segment p-06 crosses through and is near an extensive area of habitat for desert bighorn sheep in the Livingston Hills and New Water Mountains on the Kofa NWR, as well as crossing through a wildlife dispersal corridor in the northwestern corner of the refuge. Segments in-01 and i-04 cross desert bighorn sheep habitat and a dispersal corridor along I-10 through the Plomosa Mountains. Segment x-05 also crosses a dispersal corridor through the La Posa Plain between the New Water and Dome Rock mountains.

- The following route segments cross important dispersal corridors for desert bighorn sheep and are important linkages among blocks of undisturbed wildlife habitat in the region (AGFD 2016a; BLM 2008c, 2008d; Weinstein et al. 2003): Segments i-01 and i-04 along I-10 through the Plomosa Mountains.
- Segment i-07 along I-10 through the Dome Rock Mountains
- Segment p-01 between Burnt Mountain and Saddle Mountain to the south and the Big Horn Mountains to the north
- Segment p-06 through Livingston Hills and the New Water Mountains in the northwestern corner of Kofa National Wildlife Refuge
- Segment x-05 through the La Posa Plain between the New Water and Dome Rock mountains

Quartzsite Zone

The Quartzsite Zone route segments cross the La Posa Plain and foothills of the Dome Rock Mountains. Vegetation in the lower elevations of the La Posa Plain is typical of the Lower Colorado River Valley subdivision of the Sonoran Desert, and the foothills and other higher elevation areas are in the Arizona Uplands subdivision.

- The biological study area in the Quartzsite Zone contains one wildlife water identified as Tule Tank, located 1.3 miles from Segment p-09 (AGFD 2016a).
- Segments qn-02 and qs-02 cross Category 3 habitat for the Sonoran desert tortoise in the La Posa Plain west of Quartzsite.

Table 3.5-23 details the Sonoran pronghorn nonessential experimental population area that would be intersected by segments within the Quartzsite zone.

Table 3.5-23 Sonoran Pronghorn Nonessential Experimental Population Area Intersected by Segments in the Quartzsite Zone

SEGMENT	LENGTH (TO NEAREST HALF-MILE)	COUNTY
p-07	2.0	La Paz
p-08	0.5	La Paz
p-09	7.0	La Paz
qn-01	0.5	La Paz
qs-01	3.0	La Paz
qs-02	5.0	La Paz
i-05	3.0	La Paz
x-05	10.0	La Paz
x-06	9.0	La Paz
x-07	7.5	La Paz

Route segments cross important dispersal corridors for desert bighorn sheep that provide important linkages among blocks of undisturbed wildlife habitat (AGFD 2016a; BLM 2008c, 2008d; Weinstein et al. 2003). Segments p-07, p-08, x-06, and x-07 cross a desert bighorn sheep dispersal corridor through the La Posa Plain between the New Water and Dome Rock mountains. Sonoran pronghorn from the nonessential experimental population, being established in King Valley on the Kofa NWR, could move into the La Posa Plain.

Copper Bottom Zone

The route segments cross areas typical of the Arizona Upland subdivision through and to the north of the Dome Rock Mountains. Steep mountain slopes are important habitat for desert bighorn sheep (*Ovis canadensis mexicana*), and cliffs provide nesting sites for numerous raptor species. These features are found throughout the Dome Rock Mountains and throughout other mountain ranges in and surrounding the Project Area in the Copper Bottom Zone.

In the Copper Bottom Zone of the study area:

- Route segments through this area of the Dome Rock Mountains would be near one or more of three water sources, including Segment p-11 and Segment cb-03, which would be within 0.1 mile of a water source near Copper Bottom Pass; and Segment cb-02 which is within 0.3 mile of Dome Rock Mountain #1 water source west of Copper Bottom Pass.
- Route segments cross numerous washes with a higher diversity of plants and animals than is found in surrounding areas.

- Segment i-07 crosses a dispersal corridor along I-10 through the Dome Rock Mountains.
- Route segments cross Category 3 habitat for the Sonoran desert tortoise in and near the Dome Rock Mountains.

Table 3.5-24 details the Sonoran pronghorn nonessential experimental population area that would be intersected by segments within the Copper Bottom zone.

Table 3.5-24 Sonoran Pronghorn Nonessential Experimental Population Area Intersected by Segments in the Copper Bottom Zone

SEGMENT	LENGTH (TO NEAREST HALF-MILE)	COUNTY
cb-01	3.0	La Paz
cb-02	2.0	La Paz
cb-03	4.5	La Paz
cb-04	2.0	La Paz
cb-05	4.5	La Paz
cb-06	2.0	La Paz
i-06	7.0	La Paz
i-07	6.5	La Paz
p-10	1.0	La Paz
p-11	4.0	La Paz
p-12	2.5	La Paz
p-13	3.5	La Paz
p-14	1.0	La Paz
p-15e	3.0	La Paz
x-08	1.5	La Paz

Colorado River and California Zone

The Colorado River and California Zone route segments cross the Colorado River and adjacent riparian areas, cultivated and other developed land south and southwest of Blythe, and undeveloped areas with sandy soils on Palo Verde Mesa. Roads, levees, cultivated fields, or other developed areas are immediately adjacent to the Colorado River at and near all proposed river crossings, and those areas therefore have no or very narrow strips of riparian vegetation. Wildlife that is typically found in or dependent on riparian vegetation along the Colorado River are uncommon or absent at those proposed crossings. In the portion of the study area in the Colorado River and California Zone:

- The route segments cross numerous canals and drains adjacent to agricultural fields. Some of those canals and drains have well-developed wetland vegetation and could be used by numerous birds and other wildlife.
- The crossing of the Colorado River is the only location within the study area having riparian vegetation associated with a permanent water source. There are numerous special status animals that are uncommon or rare along the lower Colorado River, including birds that migrate or travel along the river corridor.
- The floodplain on the eastern side of the river, and stands of associated riparian vegetation such as salt cedar and honey mesquite, are about 0.5 to 0.7-mile-wide along Segments p-15 and cb-10. The northern Segment i-08s crosses the river where land is developed or in agricultural production, and where riparian vegetation is limited to a narrow band adjacent to the river.
- Extensive surveys for wildlife have been conducted on the undeveloped areas of the Palo Verde Mesa (BLM 2012b, 2014b; BLM and Riverside County Planning Department 2015; BLM and CPUC 2006: CPUC 2011). Common mammals observed are coyote, black-tailed jackrabbit (*Lepus californicus*), pocket mice, and white-tailed antelope ground squirrel (*Ammospermophilus leucurus*). Common bird species include cliff swallows (*Petrochelidon pyrrhonota),* horned lark *(Eremophila alpestris)*, black-throated sparrow (*Amphispiza bilineata*), verdin (*Auriparus flaviceps*), and common raven (*Corvus corax*). Common reptiles documented there include side-blotched lizard, Mojave fringe-toed lizard, desert iguana, western whiptail, and coachwhip snake.
- Three California state-listed animals (in addition to those that are also Federally listed)—Swainson's hawk, greater sandhill cranes, and Townsend's big-eared bat—could occur occasionally in the area.
- Numerous special status species may also occur on the Palo Verde Mesa, including burrowing owls, Bendire's thrasher, Le Conte's thrashers, and American badgers.

<u>*Amphibians and Reptiles*</u>

Nonnative bullfrogs (*Lithobates catesbeinanus*) are common along the Colorado River and near other permanent water sources such as agricultural canals and drains.

The nearest designated critical habitat for the Mojave desert tortoise is the Chuckwalla critical habitat unit, about 3 miles west of the Colorado River Substation (USFWS 1994b). Mojave desert tortoises are found in areas with friable soils in valley bottoms and the lower slopes of the Lower Colorado River Valley subdivision of southeastern California. Sign of Mojave desert tortoises has been found along the route of the existing DPV1 (adjacent to the Proposed Action) and elsewhere near the Colorado River Substation (CPUC 2011; Power Engineers 2012); however, Mojave desert tortoises (threatened) are uncommon along the Proposed Action route and around the Colorado River Substation.

The Mojave fringe-toed lizard, a BLM sensitive species and DRECP LUPA focus species, is only found in habitats with loose sand, and is considered common on the Palo Verde Mesa. The habitat model developed for the DRECP maps most of the Palo Verde Mesa as potentially suitable habitat for the Mojave fringe-toed lizard. However, the DRECP model is based on general habitat conditions and includes areas where the Mojave fringe-toed lizard is not expected to be found. To refine the model, documented occurrence records and habitat maps from the CNDDB were plotted with the California Geologic Survey soil map (Appendix 1, Figure 3.3-8) showing a close correlation with active wind-blown sand deposits. However, some locations do not fall within the mapped dune system, perhaps reflecting the dynamics of sandy soils and the patchy nature of these habitats not evident due to the mapping scale. In an effort to more accurately map suitable Mojave fringe-toed lizard habitat on the Palo Verde Mesa, the locations from the CNDDB of Harwood's eriastrum, another sand dune obligate species, was plotted with the Mojave fringe-toed lizard occurrences and soils data. These data tended to cluster and polygons of presumed suitable Mojave fringe-toed lizard habitat were mapped (Appendix 1, Figure 3.5-11). This map was used to calculate the linear distance of potentially suitable Mojave fringe-toed lizard habitat that would be crossed by each route segment on the Palo Verde Mesa (Table 3.5-25).

Table 3.5-25 Suitable Mojave Fringe-toed Lizard Habitat Intersected by Segment

SEGMENT	MILES OF SUITABLE MOJAVE FRINGE-TOED LIZARD HABITAT INTERSECTED
p-16	0
p-17	0
p-18	0.6
x-15	0.1
x-16	0
x-19	0.4
ca-02	0
ca-06	0
ca-07	1.1
ca-09	2.6

Fish

Fish are present in the Project Area in the Colorado River and in some of the canals south of Blythe. The only native fish that are now found in the Colorado River in the biological study area are the endangered razorback sucker (*Xyrauchen texanus*) and the endangered bonytail chub (*Gila elegans*). Nonnative sport fish in the area include sunfish (*Lepomis* spp.), striped bass (*Morone saxatilis*), largemouth bass (*Micropterus salmoides*), black crappie (*Pomoxis nigromaculatus*), carp (*Cyprinus carpio*), flathead catfish (*Pylodictis olivaris*), and channel catfish (*Ictalurus punctatus*) (BLM 2008c; LCRMSCP 2016; Minckley et al. 2003).

Razorback suckers and bonytail chub (both endangered) occur in the main channel of the Colorado River south of Blythe. Artificial backwater channels, some of which have been stocked with and are used by razorback suckers and bonytail chub, have been created along parts of the lower Colorado River to mitigate the loss of aquatic habitat caused by modifying the mainstream channel.

Backwater channels are about 1,400 feet and 200 feet south of Segments p-15e and i-08s, respectively.

Birds

The vegetation on the eastern side of the Colorado River at the southernmost Segments p-15e and cb-10 is dominated by dense to sparse stands of salt cedar and saltbush, with small stands of mesquite and paloverde along the eastern edge. Irrigated fields are immediately west of the river at those crossing locations. Because the area east of the river has a short, patchy overstory of nonnative salt cedar and little or no understory, it is very unlikely that yellow-billed cuckoos nest there; however, the areas could be used during migration or other movements along the river. Segment i-08s crosses the Colorado River where there are agricultural fields or developed land on both sides of the river, and riparian vegetation is limited to a narrow band adjacent to the river.

The segments that cross proposed critical habitat for western yellow-billed cuckoo include:

- p-15e and p-15w: 1,275 feet
- cb-10 and x-11: 986 feet
- i-08s and ca-04: 558 feet

The portion of the Colorado River south of Blythe could be used by the southwestern willow flycatcher as a migration corridor; however, the route segments cross marginal riparian habitat along the Colorado River that is likely to be used infrequently. No designated critical habitat for the southwestern willow flycatcher occurs along the lower Colorado River. In and near the Project Area, this species is managed under the LCRMSCP (2004).

The floodplain vegetation on the eastern side of the Colorado River along Segments p-15 and cb-10 could be used by migrating or foraging western yellow-billed cuckoos (threatened) and southwestern willow flycatchers (endangered), but no nesting habitat is there. Riparian vegetation that would be used by those species is very limited where Segment i-08s crosses the river.

The Yuma clapper rail is present along and near the Colorado River from the delta to the upstream The Yuma Ridgway's rail is present along and near the Colorado River from the delta to the upstream end of Lake Mead. It is also present along the Lower Gila River and some other major tributaries of the Colorado River and in marshes in the Salton Sea. It is uncommon upstream of Lake Mead along the Colorado River and in nearby major tributaries and large marsh complexes. It is found in freshwater marshes with water greater than 12 inches deep and dense to moderately dense stands of cattails, bulrushes (*Scirpus* spp.), and other emergent plants (LCRMSCP 2016; USFWS 2009). However, no emergent vegetation or other suitable habitat for Yuma Ridgway's rail is adjacent to the Colorado River at any of the segments. Backwater channels just south of Segments p-15e and i-08s were developed to create habitat for rare fish and have some emergent vegetation and marshes that could be used by Yuma Ridgway's rails. Yuma Ridgway's rails have been observed using irrigation canals and drains in the agricultural fields south and southwest of Blythe (R. Kim, CDFW, personal communication July 27, 2016). Many of those drains have dense stands of cattails and other emergent vegetation.

Mammals

Two miles of Segment cb-10 would intersect the Sonoran Pronghorn nonessential experimental population area within the Colorado River and California Zone. The nearest population of desert bighorn sheep to the study area in this zone is in the Mule Mountains, more than 2 miles south of route segments.

Mule deer are found in and near the surrounding mountains and along the Colorado River, and could infrequently forage in the desert wash woodlands crossed by route segments.

3.5.4 Summary of Biological Resources

The Project Area is in the northern part of the Sonoran biogeographical province. Average annual rainfall is generally less than 5 inches. Elevations along the route segments range from about 250 to 2,500 feet.

The Project Area crosses two subdivisions of the Sonoran Desert: Lower Colorado River Valley and Arizona Uplands. The majority of the route segments, including all segments in California, are in the Lower Colorado River Valley subdivision. Most of this area is vegetated with sparse stands of creosote bush and white bursage, often with large areas of unvegetated desert pavement. Higher-elevation areas in and near mountains cross the Arizona Uplands, which have a greater diversity of plants; dominant species include foothill paloverde and triangle burr ragweed in addition to creosote bush, white bursage, and numerous cacti. Washes in both of these subdivisions generally have a greater diversity, abundance, and stature of vegetation than do the surrounding uplands. Part of the Project Area crosses cultivated fields.

Invasive annual and perennial plant species are widespread throughout the Sonoran Desert and are common in some parts of the Project Area, including near agricultural areas along the eastern and western borders of the route and along route segments near I-10.

The Project Area has a rich diversity of wildlife typical of the lower Sonoran Desert. More than 40 species of reptiles, 350 species of birds, and 60 species of mammals, including more than 20 species of bats, have been documented in and near the Project Area. The diversity of amphibians and fish is much lower, and those species generally are restricted to permanent water sources in the area. Four big-game species—desert bighorn sheep, desert mule deer, collared peccary, and mountain lions—are present in the Project Area.

The following vegetative and physical features are important for the conservation of biodiversity in the region.

- **Riparian vegetation**. The only riparian vegetation associated with perennial water that is crossed by the route segments is along the Colorado River and in canals and drains adjacent to agricultural fields west of the Colorado River.
- **Braided channel floodplains and valley desert wash woodlands**. The route segments cross numerous desert wash woodlands in Arizona and a small number of protected microphyll woodland washes in California. Some floodplains and lower-elevation washes in the Project Area, such as Bouse Wash in the Ranegras Plain (crossed by

Segments x-04 and i-03), have dense stands of vegetation that are not found in surrounding areas.

- **Agricultural lands**. Route segments in the floodplain of the Colorado River in California cross agricultural fields with numerous canals and drains. These areas could be used by numerous birds and other wildlife, including waterfowl and sandhill cranes during the winter months.
- **Sand dunes**. The Colorado River Substation and the route segments that approach that substation are in or near an area of loose sandy soils that provides habitat for sensitive plants (i.e., Harwood's eriastrum), protected vegetation alliances (i.e., big galleta alliance and bush seepweed), and special status animal species (i.e., Mojave fringe-toed lizard). The nearest sand dunes in Arizona are east of the Colorado River on the YPG and more than 2 miles south of Segment cb-05, the nearest alternative segment.
- **Springs and other watering sites**. Thirteen wildlife waters in Arizona are in the 2-mile-wide biological study area, with route segments within 0.1 mile of water sources near the Big Horn and Dome Rock mountains.
- **Steep slopes, rock outcrops, and cliffs**. The route segments in the Dome Rock Mountains are near cliffs and steep slopes.
- **Caves and abandoned mines**. Abandoned mines, and possibly caves, are in the mountainous areas along the route segments.

Seven Federally listed threatened and endangered species are present or could be present in and near the Project Area.

- **Sonoran pronghorn** have been released into King Valley south of the Proposed Action route as an experimental nonessential population. Some released Sonoran pronghorn have traveled into or near the region crossed by route segments.
- **Western yellow-billed cuckoo** nest in riparian woodlands along the lower Colorado River. No nesting habitat is along or near any proposed crossing of that river, but this species could use those areas during migration.
- **Southwestern willow flycatcher** is uncommon in willow thickets and similar vegetation along the lower Colorado River. No nesting habitat is located along or near any proposed crossing of that river, but this species could be present there infrequently during migration.
- **Yuma Ridgway's rail (Yuma clapper rail)** has been observed in canals and drains adjacent to irrigated fields in California. Suitable habitat along and near any of the proposed crossings of the Colorado River is limited.
- **Mojave desert tortoise** are uncommon but may occur near the Colorado River Substation in California.
- **Razorback suckers** are present in backwater channels and the mainstream of the Colorado River in the Project Area.
- **Bonytail chub** (hatchery reared fish) have been released into backwater channels near the Project crossing of the Colorado River.

No plant species classified as HS under the Arizona Native Plant Law are present in the study area, although numerous plants in the region are classified as priority species by the BLM or must be considered for compliance with the ANPL. One amphibian, 7 reptiles, 1 fish, 29 birds, and 26 mammals considered in this analysis as special status species could be present in or near the Project Area in Arizona.

At least 16 special status plant species could be present in or near the Project Area in California. Two of these, Harwood's eriastrum (BLM sensitive) and Harwood's milkvetch (CNPS rare), have been found on sandy soils along the route segments, and other special status plants and animals could be present in that area. One special status species of amphibian, 3 reptiles, 1 fish, 24 birds, and 13 mammals are present or could be present in or near the Project Area in California. In addition to the Federally protected species described above, three species classified as threatened or endangered by CDFW could be present in or near the Project Area: Swainson's hawk, greater sandhill cranes, and Townsend's big-eared bat.

3.6 CULTURAL RESOURCES

Cultural Resources are defined as including archaeological sites; historic buildings, structures, or places; and places of traditional cultural or religious significance. The following definition of "Cultural Resource" is abridged from the BLM H-8100 handbook:

> …any definite location of past human activity, occupation, or use, identifiable through field inventory (survey), historical documentation, or oral evidence; such terms may include archaeological, historic, or architectural sites, structures, or places or sites, or places of traditional cultural or religious importance to specified social and/or cultural groups, whether or not represented by physical remains.

Information contained in this section is largely summarized from Class I documentation for the Project reported in Brodbeck et al. (2017).

3.6.1 Applicable Laws, Regulations, Policies, and Plans

The Project is an undertaking and the BLM is serving as the lead Federal agency for the NEPA review and cultural resource compliance. The Project involves Federal, state trust, and private land, thus requiring compliance with a number of Federal, state, and local laws regarding evaluation, management, and treatment of cultural resources. Summaries of Federal, state, and local laws, regulations, and standards that govern cultural resources for the Project, in addition to relevant BLM plans, agreement documents, and policies follow.

3.6.1.1 Federal Laws and Regulations

National Historic Preservation Act, as amended

The National Historic Preservation Act (NHPA) of 1966 (54 USC 300101 et seq.) established the National Register of Historic Places (NRHP) and the President's Advisory Council on Historic Preservation, and provided that states may establish State Historic Preservation Offices (SHPOs) to carry out some of the functions of the NHPA. Most notably for Federal agencies responsible for managing historic properties, Section 106 of the NHPA directs that "[t]he head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or Federally assisted undertaking in any state and the head of any Federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the NRHP." Section 106 also affords the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking.

Section 106 of the NHPA is implemented by the regulations at 36 CFR 800. The Section 106 process is designed to identify historic properties (those cultural resources listed in or eligible for listing in the NRHP), to assess the effects of an undertaking on historic properties, and to resolve adverse effects through avoidance, minimization, or mitigation.

Under Section 106, cultural resources are evaluated for their eligibility per NRHP criteria defined in 36 CFR 60. Cultural resources generally include archaeological sites, historic buildings and structures, artifacts, and places of cultural or religious significance to tribes.

To be eligible for inclusion in the NRHP, cultural resources must be at least 50 years old (unless they meet Criterion Exception G for properties that have achieved significance within the past 50 years) and must meet one or more of the following criteria:

Criterion A: applies to properties that are associated with events that have made a significant contribution to the broad patterns of our history.

Criterion B: applies to properties that are associated with the lives of persons significant in our past.

Criterion C: applies to properties that embody the distinctive characteristics of a type, period, or method of construction; or that represent the work of a master; or that possess high artistic values; or that represent a significant and distinguishable entity whose components may lack individual distinction.

Criterion D: applies to properties that have yielded, or may be likely to yield, information important in prehistory or history.

Significant cultural resources must also possess integrity, which is the composite of seven qualities: location, design, setting, materials, workmanship, feeling, and association. Not all of these qualities have to be present for a cultural resource to be eligible for listing in the NRHP, but rather the right combination of these qualities must be present to enable the cultural resource to convey its historical importance. The integrity of archaeological sites is usually based on the degree to which the remaining evidence can provide *important* information about the prehistory or history of an area. If the cultural resource represents an important aspect in history or prehistory and possesses sufficient integrity, the cultural resource can be considered to be a historic property eligible for listing in the NRHP.

Section 106 of the NHPA and its implementing regulations found at 36 CFR 800.14 provide Federal agencies with the authority to negotiate PAs to govern the implementation of their Section 106 responsibilities. A draft PA establishing the Area of Potential Effect (APE) for Section 106 review and outlining the methods of identification, evaluation, and treatment of historic properties has been prepared for the Ten West Link 500kV Transmission Line Project. Both the Arizona and California SHPOs participated in drafting the PA.

Archaeological Resources Protection Act

The Archaeological Resources Protection Act (ARPA) of 1979 (16 USC 470aa–470ll) was enacted to preserve and protect resources and sites on Federal and Native American lands. It fosters cooperation between governmental authorities, professionals, and the public. ARPA prohibits the removal, sale, receipt, and interstate transportation of archaeological resources obtained illegally (that is, without permits) from public or Native American lands and authorizes Federal agency permit procedures for investigations of archaeological resources on public lands under the agency's control. Permits are required to excavate and remove those cultural remains covered by ARPA.

ARPA defines archaeological resources as "any material remains of human life or activities which are at least 100 years of age, and which are of archaeological interest" (43 CFR 7.3[1]). Any person who violates any prohibition contained in an applicable regulation or permit issued under ARPA may be assessed a civil and/or criminal penalty by the Federal land manager concerned.

The ARPA permit process ensures that individuals and organizations wishing to work with Federal archaeological resources have the necessary professional qualifications and Federal standards and guidelines for research and curation are followed. The ARPA permit replaces the permit required by the Antiquities Act of 1906.

American Indian Religious Freedom Act (AIRFA)

The American Indian Religious Freedom Act (AIRFA) of 1978 (Public Law 95-341) was passed by Congress to protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise their traditional religions, including, but not limited to, access to sites, use and possession of sacred objects, and the freedom to worship through ceremonies and traditional rites. Thus, any site or place (prehistoric or historic) with religious, ceremonial, or sacred aspects or components needs to be evaluated within the context of this law. The law requires that Federal agencies review policies for compliance, but it contains no enforcement provisions or sanctions for protocols or procedures that do not comply with the overall policy.

Native American Graves Protection and Repatriation Act

The Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) and the regulations that allow for its implementation (43 CFR 10) address the rights of lineal descendants, Native American Tribes, and Native Hawaiian organizations to Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony (cultural items). The statute requires Federal agencies and museums that receive Federal funds to provide information about Native American cultural items to parties with standing and, upon presentation of a valid claim, ensure the item(s) undergo disposition or repatriation.

Other Relevant Laws, Policies, and Agreements

- Antiquities Act of 1906 (16 USC 431–433) protects archaeological sites and historic structures on Federal lands by allowing the President to declare them national monuments and establishes a permitting requirement for excavation and collection of objects of antiquity from sites on Federal lands;

- Archaeological and Historic Preservation Act (16 USC 469–469c) directs Federal agencies to notify the Secretary of the Interior whenever they find a Federal or Federally assisted, licensed or permitted project may cause loss or destruction of significant scientific, prehistoric, or archaeological data;
- Historic Sites, Buildings and Antiquities Act (16 USC 461–462, 464–467), which declares it a national policy to preserve historic sites and objects of national significance, including those located on refuges. It provides procedures for designation, acquisition, administration, and protection of such sites;
- National Trails System Act (16 USC 1241–1251) establishes a National Trails System and promotes the preservation of, public access to, travel within, and enjoyment and appreciation of the open-air, outdoor areas, and historic resources of the Nation;
- EO 13007, Indian Sacred Sites, is designed to protect, when practical, access to Native American sacred sites on Federal land;
- EO 13175, Consultation and Coordination with Indian Tribal Governments, encourages the strengthening of government-to-government relations between the US government and Native American Tribes;
- EO 13287, Preserve America, directs the Federal Government to provide leadership in preserving America's heritage by actively advancing the protection, enhancement, and contemporary use of the historic properties owned by the Federal Government, and by promoting intergovernmental cooperation and partnerships for the preservation and use of historic properties;
- EO 11593, Protection and Enhancement of Cultural Environment, directs the Federal Government to provide leadership in preserving, restoring, and maintaining the historic and cultural environment of the Nation;
- Programmatic Agreement Among the Bureau of Land Management – California, The California Office of Historic Preservation, and the Advisory Council on Historic Preservation Regarding Renewable Energy Development on a Portion of Public Lands Administered by the Bureau of Land Management–California, a Section 106 agreement document that presents legal clauses and stipulations for the protection of historic properties during land use planning and withdrawal decisions within the boundaries of BLM California’s DRECP;
- The BLM has issued several manuals that are relevant to the Project, including “MS-8100: The Foundation for Managing Cultural Resources” (BLM 2004a), “MS-8110: Identifying and Evaluating Cultural Resources” (BLM 2004b), “MS-1780: Tribal Relations” and “H-1780-1: Improving and Sustaining BLM-Tribal Relations” (BLM 2016d and 2016e), and “MS-8140: Protecting Cultural Resources” (BLM 2004d);
- Management of cultural resources on BLM-administered land is also directed by current RMPs or Conservation Plans for the each of the BLM Planning Zones within the analysis areas. Several BLM land use plans detail a framework for managing public lands within

the analysis area: Lower Sonoran, Arizona (BLM 2012a); Bradshaw, Harquahala, Arizona (BLM 2010c); Yuma, Arizona (BLM 2010b); Lake Havasu, Arizona (BLM 2007); California Desert Conservation Plan (BLM 1980); Northern and Eastern Colorado Desert Coordinated Management Plan (BLM 2002b); and the DRECP (BLM 2016a).

3.6.1.2 Tribal Laws and Regulations

Colorado River Indian Tribes

CRIT land laws and ordinances regarding cultural resources apply to the portion of the Project on the reservation. The CRIT Human and Cultural Research Code creates a uniform (ethical) standard in how research on the reservation is conducted to preserve and protect the unique and distinctive languages, cultures, and traditions of the tribes.

To obtain development approval from the CRIT, Section 2-104(8) of the Land Code Article 2 (Development Review) requires review and analysis of potential impacts on archaeological and cultural resources within a project site and throughout the surrounding area, where any resources could reasonably be anticipated to be adversely affected, either directly or indirectly, by the development. The review must be prepared by a qualified person who has been approved by the director of the CRIT Museum (now Tribal Historic Preservation Office [THPO]). Section 2-104(8) also stipulates that development projects should incorporate measures to mitigate or avoid potential impacts to the resources to the maximum extent feasible.

To accurately interpret CRIT law in its application to cultural matters, it is important to distinguish between CRIT and Western interpretations of the term "mitigation." The Western definition of "mitigation" is "to cause to become less harsh or hostile" (Merriam-Webster 2017). According to CRIT law, spiritual and cultural harm cannot be "lessened" through measures such as commissioning an ethnographic or cultural resources inventory study. Instead, when avoidance is truly impossible, the tribal footprint must remain intact so as to not break connectivity with the land and oral traditions. This is the reason why the tribes insist that cultural resources remain buried in the ground.

Section 2-107 of the Natural Resources Code Article 2 (Camping) pertains to cultural resources and states that "no person shall remove, injure, disfigure, deface or destroy and object of archaeological or historical interest or value." Section 2-108 of the Natural Resources Code Article 2 (Camping) further states that if it is found that removal, treatment, or disturbance of geological, historical, archaeological, or paleontological material is in the best interest of the tribe, the Chief Game Warden, with the concurrence of the Director of the Tribal Museum, may issue a special permit. The holder of a properly granted permit may be allowed to remove, treat, or disturb materials, and not be liable for prosecution.

3.6.1.3 State Laws and Regulations

Arizona

State Legislation
The State Historic Preservation Act of 1982 (ARS §41-861 through §41-864) requires state agencies to identify and preserve historic properties and outlines criteria for listing of properties on the state register (identical to criteria for listing on the NRHP). The act also stipulates a

consultation period for SHPO review of 30 days to provide comment on agency plans that affect historic properties or recommendations of eligibility for the state or national registers.

The Arizona Antiquities Act (ARS §41-841 through §41-847) stipulates that a permit is needed for excavation of prehistoric and historic sites on state land, county land, or land owned or controlled by municipalities, and requires that the Arizona State Museum (ASM) be notified of the discovery of cultural resources or human remains. ARS §41-844 and ARS §41-865 ensure that human remains, funerary objects, sacred objects, and objects of cultural patrimony discovered on state lands, and human remains and associated objects from private lands, are treated with respect and dignity.

These Arizona laws provide that groups claiming biological relationship or cultural affinity with the remains have a very significant role in determining the treatment and disposition of these culturally significant materials. Additionally, the laws ensure that other relevant interests are represented in the decision-making process. In Arizona, the Repatriation Coordinator at ASM is the authority designated to coordinate the treatment and disposition of human remains with tribal groups claiming biological or cultural affinity with such remains.

California

California Environmental Quality Act
The CEQA is a state law, similar to NEPA that includes cultural resources preservation within its general policy of environmental protection. CEQA requires that the lead agency determine if there are historical resources within a project area that are listed in the California Register of Historical Resources, or if additional properties not yet listed may be historical resources or legally defined unique archaeological sites for purposes of CEQA. If so, the lead agency must then determine if the proposed project has the potential to impact those resources.

Public Resources Code, Section 5020-5029, 5097 et seq.
Section 5024.1 of the Public Resources Code established the California Register of Historical Resources (CRHR), the state equivalent to the NRHP. The CRHR includes all properties listed in or determined eligible for listing in the NRHP, California Historical Landmarks from number 770 on, and resources approved for listing by the State Historical Resources Commission. Lead agencies have a responsibility to evaluate historical resources against the CRHR criteria prior to making a finding as to a proposed project's impacts to historical resources. Mitigation of adverse impacts is required if the proposed project will cause substantial adverse change. Substantial adverse change includes demolition, destruction, relocation, or alteration such that the significance of a historical resource would be impaired. While demolition and destruction are fairly obvious significant impacts, it is more difficult to assess when change, alteration, or relocation crosses the threshold of substantial adverse change.

The Public Resources Code also includes:

- Emergency Projects, Section 5028
- State-owned Historical Resources, Section 5024, 5024.5
- Archeological, Paleontological, and Historical Sites, Section 5097-5097.6
- Native American Historical, Cultural, and Sacred Sites, Section 5097.7-5097.991

Assembly Bill 52 (AB-52)
"Tribal Cultural Resources" are a new class of resource protected under AB-52 of CEQA. These resources are defined as either (1) "sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American Tribe" that are included in the state register of historical resources or a local register of historical resources, or that are determined to be eligible for inclusion in the state register; or (2) resources determined by the lead agency, in its discretion, to be significant based on the criteria for listing in the state register.

Under AB-52, a project that may cause a substantial adverse change in the significance of a tribal cultural resource is defined as a project that may have a significant effect on the environment. Where a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document must discuss the impact and whether feasible alternatives or potential adverse effect resolution measures could avoid or substantially lessen the impact.

Recognizing that tribes have expertise with regard to their tribal history and practices, AB-52 requires lead agencies to provide notice to tribes that are traditionally and culturally affiliated with the geographic area of a proposed project if they have requested notice of projects proposed within that area. If the tribe requests consultation within 30 days upon receipt of the notice, the lead agency must consult with the tribe. Consultation may include discussing the type of environmental review necessary, the significance of tribal cultural resources, the significance of the project's impacts on the tribal cultural resources, and alternatives and potential adverse effect resolution measures recommended by the tribe.

The parties must consult in good faith, and consultation is deemed concluded when either the parties agree to measures to mitigate or avoid a significant effect on a tribal cultural resource (if such a significant effect exists) or when a party concludes that mutual agreement cannot be reached.

Other Relevant Laws

California Health and Safety Code Section 7050.5, "Discovery of Human Remains," declares that, in the event of the discovery of human remains outside a dedicated cemetery, all ground disturbances must cease and the county coroner must be notified. In the case of prehistoric Native American remains, the Native American Heritage Commission must also be notified, which in turn must notify those persons believed to be most likely descended from the deceased Native American for determining the appropriate disposition of the remains.

3.6.1.4 Local Laws and Regulations

La Paz County, Arizona

La Paz County General Plan does not have specific ordinances or policies regarding the management of cultural resources. State laws apply to County-owned lands.

Maricopa County, Arizona

The Maricopa County 2030 Vision General Plan (Maricopa County 2016) recognizes the importance of historical and prehistoric cultural resource preservation. For its part, Maricopa County supports preserving significant cultural sites, particularly by coordinating with SHPO to ensure that, where necessary, land is surveyed for potential cultural resources before new development occurs, and that potential adverse effect resolution measures are used when needed (*Environment Policy #5*).

Riverside County, California

The Riverside County General Plan (Riverside County 2015a) addresses the management of cultural resources as part of the Plan's Open Space Element. The Plan identifies cultural resources as nonrenewable resources that often yield unique information about past societies and environments, and provide answers for modern day social, scientific, and heritage concerns. The consideration and preservation of important examples of history within Riverside County benefit the public by maintaining historic identity and a sense of place and tradition. Open Space (OS) Policies for the management of cultural resources include OS 19.1 Cultural resources (both prehistoric and historic) are a valued part of the history of Riverside County;

OS 19.2 Riverside County shall establish a Cultural Resources Program in consultation with tribes and the professional cultural resources consulting community that, at a minimum, would address each of the following: application of the Cultural Resources Program to projects subject to environmental review; government-to-government consultation; application processing requirements; information database(s); confidentiality of site locations; content and review of technical studies; professional consultant qualifications and requirements; site monitoring; examples of preservation and mitigation techniques and methods; curation and the descendant community consultation requirements of local, state, and Federal law;

OS 19.3 Review proposed development for the possibility of cultural resources and for compliance with the cultural resources program;

OS 19.4 To the extent feasible, designate as open space and allocate resources and/or tax credits to prioritize the protection of cultural resources preserved in place or left in an undisturbed state;

OS 19.5 Exercise sensitivity and respect for human remains from both prehistoric and historic time periods and comply with all applicable laws concerning such remains.

City of Blythe, Riverside County, California

The City of Blythe General Plan 2025 (City of Blythe 2007) addresses cultural resources in its Open Space and Conservation Element. Specifically, Section 6.7 of the Plan—*Archaeological, Historic, Paleontological Resources*—addresses prehistoric and historic cultural resources. The Plan recognizes that development of lands that are now vacant or in agricultural use could disturb surface and subsurface archaeological resources, and that site-specific analysis is needed for future development projects, particularly in areas with high sensitivity for archaeological resources.

Guidance Policy 25, *Protect archaeological, historic, and paleontological resources for their aesthetic, scientific, educational, and cultural value*, stipulates the following:

Require a records search for a development project proposed in areas of high archaeological sensitivity to determine whether the site contains known prehistoric or historic cultural resources and/or to determine the potential for discovery of additional cultural resources.

Require that sponsors of projects on sites where probable cause for discovery of archaeological resources (as indicated by records search and where resources have been discovered in the vicinity of a project) retain a consulting archaeologist to survey the project site. If unique resources, as defined by state law, are found, require preparation of an archaeological resource mitigation plan; monitor to ensure that mitigation measures are implemented.

The policy also includes stipulations of unanticipated discoveries, the discovery of human remains, and documentation standards.

3.6.2 Analysis Area

The analysis area for the Project would consist of areas where direct and indirect effects to cultural resources may occur. Direct effects are defined by areas where ground disturbance required for Project construction, such as structure locations, access roads, lay down areas, and spur roads, would occur. Indirect effects, such as visual, auditory, or atmospheric changes, would also be considered. The APE under Section 106 differs from the cultural resources analysis area discussed in this Technical Environmental Study.

Cultural resources project and site information collected and compiled by the Class I inventory are presented in two tiers: (1) an area measuring 1 mile (0.5 mile on either side of the centerline) encompassing the Proposed Action segments and Alternative Segments; and (2) a 200-foot-wide corridor (measuring 100 feet on either side of the centerline) encompassing the Proposed Action segments and Alternative Segments. For the 12kV SCS distribution line, Class I inventory data was collected for the 1-mile area and a 20-foot-wide corridor to encompass the maximum requested ROW width. This level of investigation was considered to provide the most useful quantification of existing cultural resources data for analyses.

3.6.2.1 Class I Inventory

A Class I inventory refers to the collection of data on previously conducted cultural resources investigations and the scope and adequacy of those investigations. The inventory includes the type, number, and NRHP status of previously recorded cultural resources; the presence of NRHP-listed historic properties; and areas of cultural significance to tribal communities with ties to the Project Area. As the first tier of cultural resources information gathering, the Class I inventory provides data on the nature and density of existing cultural resources so that likely effects of new ground disturbance can be evaluated as part of the basis for recommending further cultural resource work. Many of the Project alternatives have been intensively surveyed for cultural resources by other projects in the past, so the Class I overview provides substantial information about the types and distribution of known cultural resources in the Project Area. The BLM is using the substantial available Class I and ethnographic information, including feedback from the tribes, as baseline data to inform the analysis of alternatives to select the best route for the Project, should it be approved. Using this method, BLM is following Advisory Council on Historic Preservation (ACHP) guidance for coordinating Section 106 and NEPA processes for analysis (http://www.achp.gov/nepa.html).

Brodbeck et al. (2017) presents a compilation of the cultural resources Class I inventory data summarized in this section. The Class I inventory focused on a study area defined as an area measuring 1 mile encompassing the alternative and subalternative segments. Per the BLM's data needs document, and consistent with the BLM H-8100 handbook, data collection consisted of requesting and compiling data held by the following Federal, state, tribal, and local sources.

Federal Sources

- BLM field offices
- NRHP database
- General Land Office (GLO) maps
- Bureau of Indian Affairs (BIA) Western Regional Office
- Bureau of Reclamation
- Known tribal areas of concern (via BLM)

Arizona Sources

- ASM via Arizona Archaeological Site and Survey Database (AZSITE), Arizona's electronic cultural resources database
- Arizona Register of Historic Properties
- Arizona SHPO

California Sources

- California Historical Resource Information System (CHRIS), Eastern Information Center
- Known tribal areas of concern (via California Native American Heritage Commission)
- Tribal Historic Preservation Offices
- CRIT THPO (data request only)

Local Sources

- Historical societies
- Historic highway and other local maps

Cultural Resources Sensitivity Analysis

The Class I cultural resources data available for the California portion of the Project has been compiled into a sensitivity analysis (Kline 2017). The results of the sensitivity analysis are discussed in association to relevant segments, alternatives, and subalternatives located in the Colorado River and California Zone. The sensitivity analysis is a specific Project requirement for compliance with the CDCA Plan as amended (BLM 1980) and the DRECP PA (BLM California 2016). The sensitivity analysis is specific to segments within the California and Colorado River Zone and is included in confidential Appendix 3B.

Survey Adequacy

The results of the Class I inventory demonstrated that many of the previously conducted cultural resources surveys took place 10, 20, or even 40 years ago. Over the last several decades, recording standards have changed, our understanding of the archaeological record has progressed, and recording techniques have improved dramatically—such as through the implementation of GPS technology. Furthermore, the conditions of sites change over time through a combination of natural and cultural influences. Sites can be affected naturally by weathering, erosion, and depositional processes. The visibility of sites on the surface can vary over time as natural processes expose and bury cultural deposits. Cultural factors affecting site condition can include a variety of disturbances such as impacts from off-road vehicles, surface collecting, and partial to complete destruction from development. As such, Arizona and California have general guidelines for the shelf life of archaeological survey data and generally require new survey and site condition updates after periods of time.

The California Office of Historic Preservation's guidelines for conducting surveys calls for a 5-year threshold for assessing survey adequacy (http://ohp.parks.ca.gov, accessed January 17, 2017):

> *Local surveys are planning tools which, ideally, should continue to enlarge and expand on previously gathered information. While an existing survey over five years old can provide valuable information, it is appropriate to update the survey to ensure that local planning and preservation decisions are based on the most current information available.*

For Arizona, SHPO Guidance Point #5 (SHPO 2004) was issued out of concern that older surveys (approximately 10 years) may no longer constitute adequate representations of the archaeology of a given area. The guidance also acknowledges that not all older surveys are inadequate, either from the perspective of meeting state and Federal standards or from a knowledge standpoint.

Therefore, for purposes of the Project, surveys conducted in California within the last 5 years (2013 to 2018) are considered adequate and do not require new survey. Surveys in California older than 5 years (prior to 2013) would require new survey. For Arizona, surveys conducted within the last 10 years (2008 to 2018) are considered adequate and do not require new survey. Surveys in Arizona older than 10 years (prior to 2008) would require new survey. Exceptions to this rule are the prior surveys performed between 2003 and 2004 by EPG for the proposed Devers to Palo Verde 500kV No. 2 (DPV2) transmission line project (Dobschuetz et al. 2007; Luhnow 2007; Luhnow and Dickinson 2007). These surveys meet current standards and have direct relevance to the current Project. The California and Arizona SHPOs would be consulted to confirm surveys are considered adequate, and regardless of adequacy, a complete Class III pedestrian survey would be conducted for the selected route, should the Project be approved. For the purposes of this Technical Environmental Study, however, all past cultural resources inventories, regardless of age, are employed in calculating the percentage of surveyed space. Percent surveyed space is critical in understanding the basis for numbers of recorded sites and also for projecting the number of sites likely to be found in unsurveyed space.

3.6.2.2 Class III Pedestrian Cultural Resources Survey

Once Project alternatives are fully analyzed and evaluated and the final route is selected, the Class I data would be used to inform on additional field investigations that would be required (Class III cultural resources survey). Class III field investigations would not be initiated until the Project's Section 106 APE is defined. Once the route is selected and the APE is defined, the scope of the Class III cultural resources survey would be determined based on the analysis of the adequacy of existing surveys using the agency guidelines outlined above. Class III survey would be required in those portions of the APE where no previously conducted investigations could be demonstrated.

3.6.2.3 Indirect Effects Assessment Methodology

As a Federal agency, BLM is required to consider all effects of the Project to historic properties, including indirect auditory, atmospheric, and visual effects. Historic properties that are considered to be especially sensitive to indirect effects are typically those for which integrity of setting, feeling, and association are contributors to the property's NRHP eligibility and its ability to convey a sense of its own significance. Properties considered to be sensitive to indirect effects can be National Historic Landmarks (NHLs), Traditional Cultural Properties (TCPs), National Historic Trails, and other classes of historic properties that are eligible under NRHP Criteria A, B, or C.

Given the nature of the Project, indirect auditory and atmospheric effects of the Project would be associated with construction, particularly activities that would be long in duration, extensive in scope, or in close proximity to a historic property. These intensive construction areas may include equipment staging locations, areas prone to excessive noise or dust, the movement of heavy equipment, or even the flight paths of helicopters delivering large construction items. Any effects on historic properties sensitive to auditory or atmospheric effects would be measured by the potential to affect the integrity of the property's setting, feeling, and association, if that integrity has been retained.

Since the Project includes the construction of new transmission structures and other vertical elements, indirect visual effects to sensitive historic properties are of specific concern. As the Project moves forward, a full visual effects assessment would be completed on potentially sensitive properties identified by background research and field studies. Specific places of known sensitivity to Indian tribes have been identified and are outlined in the Project's Class I literature review and ethnographic reports (Brodbeck et al. 2017; Leard and Brodbeck 2017).

The analysis area for indirect effects to known places of tribal concern from a visual standpoint includes 5 miles on either side of the Project segments. This level of analysis was performed for a very few locations of known tribal sensitivity, as identified through the Class I literature review and ethnographic reports produced for the Project (Brodbeck at al. 2017; Leard and Brodbeck 2017). In certain situations, the 5-mile visual corridor was adjusted based on the presence of topography that restricted the viewshed. The purpose of the visual assessment is to assess the effects of the Project on known sensitive resources of tribal concern whose character-defining properties could be adversely impacted by visual intrusions, and other indirect effects. An expanded corridor for assessing visual effects is necessary in order to allow for relatively subtle, but potentially important, visual effects, as well as for errors or ambiguities in the recorded locations and boundaries of some resources.

Government-to-government consultation with tribes, as well as consultation with other interested communities and parties, as required by the Section 106 and CEQA process to identify properties of concern and potential visual effects is currently ongoing. The BLM, as the lead Federal agency, is guiding these government-to-government consultation efforts. Section 4.6.2 provides a summary of continuing consultation conducted for the Project; Section 3.7.1.2 provides an overview of ongoing tribal coordination through the NEPA process.

3.6.3 Existing Conditions

3.6.3.1 Cultural History

The following summary provides the interpretative framework for evaluating, interpreting, and understanding the cultural resources identified in the study area. To evaluate significance of cultural resources and their eligibility for inclusion on the NRHP, a site or property must be understood within an appropriate interpretive context. The NPS provides guidance regarding significance and eligibility, which is based on the application of historic context:

> To qualify for the National Register, a property must be significant; that is, it must represent a significant part of history, architecture, archaeology, engineering, or culture of an area, and it must have the characteristics that make it a good representative of properties associated with that aspect of the past. The significance of a historic property can be judged and explained only when it is evaluated within its historic context. Historic contexts are those patterns, themes, or trends in history by which a specific occurrence, property, or site is understood and its meaning (and ultimately its significance) within prehistory or history is made clear (NPS 1997).

Historic contexts are established by theme, period, and geographic limits and provide guidance for assessing sites associated with the context.

Human settlement across the Project Area through time was largely a function of water sources. People have lived relatively continuously just east of the Project Area in the Salt and Gila river valleys, now generally the Phoenix metropolitan area, and in the western end of the Project Area along the Colorado River. The intervening desert between these two major and reliable water courses has always been formidable desert terrain, but one with an abundance of natural resources for those who know where and how to find them. The Project Area also contains a number of trails, used prehistorically and historically, which represent conduits of cultural, economic, and social interaction between populations, and are part of the traditional landscapes of contemporary tribal groups.

A pervasive cultural context within the study area is fragile pattern archaeology. Julian Hayden introduced the concept of “fragile patterns” to identify and describe ephemeral and easily destroyed archaeological sites and features, particularly those occurring in desert landscapes such as those found in the Project Area, which can range from small ephemeral sites to long, land-extensive features such as desert trails (Altschul and Rankin 2008; Hayden 1965). Many of these may include shallow features such as stone circles, rock alignments, sparse surface artifact scatters, as well as trail segments. Fragile pattern sites often have few datable diagnostics, little to no stratigraphy, and as a result may be enigmatic or difficult to interpret. Nevertheless, as we learn more about fragile pattern areas, their significance begins to emerge (Czarzasty et al. 2009). This is especially true of trail segments, which when placed in an ethnographic or archaeological context can be related to larger regional systems of traditional indigenous travel, trade, or other socio-cultural activity.

The region’s prehistory is defined archaeologically by six main developmental periods: the possible Pre-Clovis Cultural Tradition (13,000 before Christ [BC] to 11,500 BC), the Paleoindian (San Dieguito) (11,500 BC to 6000 BC), the Archaic Period (6000 BC to *anno Domini* [AD, or in the year of our Lord] 300), the Hohokam Tradition (AD 300 to AD 1450) for the eastern portion of the Project Area, the Patayan Tradition (AD 700 to AD 1900s) for the western portion of the Project Area, and the Ethnohistoric Period (circa AD 1500 to AD 1950). An overview of these main cultural periods is presented here as context, along with a summary of the historic period.

Possible Pre-Clovis Cultural Tradition (13,000 to 11,500 BC)

Beginning about 11,500 BC, the Clovis cultural tradition is clearly recognizable in the archaeological record across North America as evidence of early humans in North America. Originating in southern Siberia, the Clovis people had crossed Beringia around 12,500 BC and subsequently migrated through a corridor between the receding Laurentide and Cordilleran ice sheets and rapidly expanded across the continent.

This traditional archaeological view of human entrance into North America is being challenged by archaeologists exploring possible pre-Clovis coastal migration of people dating back as far as 13,000 BC (Fiedel 2014). Sites such as Monte Verde in southern Chile (Dillehay 1997; Dillehay et al. 2008), the Debra L. Friedkin site in Texas (Waters et al. 2011), and the Paisley Caves in southern Oregon have provided intriguing archaeological and genetic evidence to support the pre-Clovis model (Beck and Jones 2010; Bodner et al. 2012; Erlandson and Braje 2011), although critiques of deposition contexts and site formation processes have raised doubts regarding some of the early dates purported (Fiedel 2014). Critics have also noted that no pre-Clovis sites have been identified along the entire coast from Alaska to Tierra del Fuego older than 11,500 BC (Dickinson 2011), raising further skepticism.

Paleoindian Period (11,500 to 6,000 BC)

The Paleoindian Period in southeastern California and southwestern Arizona marks the introduction of people into the region that is clearly recognizable in the archaeological record. The Paleoindian Period spans the end of the Pleistocene epoch and the first several millennia of the Holocene epoch (Huckell 1996; Rogers 1966; Stone 1991; Warren and True 1961). These early groups were highly mobile foragers that hunted a variety of large and small game animals (including extinct megafauna) and collected a diversity of wild floral resources. Paleoindian site types include isolated spear points, such as Clovis and Folsom type, small temporary campsites, and hunting/butchering sites. Evidence of Paleoindian sites is often found in eroded terrain where older stratigraphic deposits have been exposed, along the shorelines of late Pleistocene lakes, in caves, and on stable landforms exhibiting desert pavement-capped pediments and terraces. Paleoindian sites could be represented in other contexts, such as the alluvial valleys within the Project Area, where thick accumulation of Holocene sediments have covered over older Pleistocene/early Holocene surfaces. In the Chuckwalla Valley, approximately 10 miles from the Colorado River Substation in California, investigations at CA-RIV-11733 identified a Clovis spear point basal section, indicating Paleoindian use of the Project Area (George Kline, personal communication, 2017).

The Paleoindian expression in western Arizona and southern California was defined by Rogers (1939, 1958a, 1958b, 1966) into three subperiods: San Dieguito I, II, and III. Researchers questioned the validity of Roger's phased sequence, which was based on data derived from surface artifact scatters rather than from stratigraphic contexts (Stone 1991). San Dieguito Phase sites are generally defined by simple primary and secondary percussion reduction technology. In contrast, San Dieguito II and III site assemblages are defined by more complex production technologies and a wider diversity of artifact types, such as bifacial and unifacial chopping tools, spoke-shave scrapers, scraper planes, and bilaterally notched pebbles (Dobschuetz et al. 2007). Furthermore, San Dieguito II and III are differentiated by further refinement of lithic production techniques and resulting artifact types. San Dieguito II assemblages include a variety of small bifacial points, choppers, and scrappers. San Dieguito III sites are associated with finely crafted pressure flake blades, leaf-shaped projectiles, scraper planes, plano-convex scrapers, crescentrics, and elongated bifacial knives (Rogers 1939; Warren and True 1961).

Archaic Period (6,000 BC to AD 300)

Following climate changes at the end of the Pleistocene, the Archaic Period was characterized by small, mobile bands of hunter-gatherers foraging within seasonal rounds and using a more diversified tool assemblage, including milling stones that reflect an increased reliance on processing wild foods. This hunter-gathering lifestyle was a very stable cultural pattern that persisted for approximately six millennia, prior to the introduction of agriculture. As populations slowly grew and seasonal mobility became more restricted, Archaic people adapted by aggregating into larger social groups. Sites such as camp clearings, petroglyphs, zoomorphic geoglyphs (intaglios), trails, and shrines are often associated with the Archaic Period (Dobschuetz et al. 2007). In California, the Genesis Solar Facility Project identified Archaic period sites that exhibited diagnostic artifacts such as Lake Mojave/Silver Lake and Pinto projectile points in the vicinity of the Project Area (AECOM 2016).

In parts of Arizona, such as the Tucson Basin, there is evidence of early cultivation and use of canals dating to approximately the last 2,000 years of the Archaic Period (Mabry 1998), which archaeologists have now defined as the Early Agricultural Period. The transmission to agriculture, more sedentary settlements, and the development of pottery technology was certainly gradual beginning in a few areas and was slowly adapted across much of the Southwest. By AD 300, the shift to agricultural lifestyles is evident with the emergence of the Hohokam of central Arizona and the Patayan of the Lower Colorado River Valley.

Hohokam Tradition (AD 300 to AD 1450)

The archaeological record of south-central Arizona, which included the Phoenix metropolitan area, is dominated by evidence of village-dwelling farmers known as the Hohokam, whom archaeologists have investigated for more than a century. Some of the early research focused on explaining the transition from the nomadic hunting and gathering subsistence strategy of the Archaic Period to the village-farming subsistence strategy of the Hohokam. Haury (1945, 1950) originally postulated that the Hohokam lifeway developed from the local Archaic culture, but later argued that the Hohokam immigrated to the Gila-Salt Basin from the south, bringing their crops and ceramic-container technology with them (Haury 1976). A variation of that model posits that the Hohokam immigrants subjugated indigenous peoples (the O'odham) who had already adopted farming and pottery making (Di Peso 1956, 1979). According to that model, the O'odham, after several centuries, overthrew the Hohokam and became the people now known as the Akimel O'odham (Pima) and the Tohono O'odham (Papago).

A number of years ago, researchers began to examine Hohokam data within the framework of a far-flung regional system (Crown and Judge 1991; Wilcox 1979, 1980). The Gila-Salt Basin was viewed as the Hohokam core area, surrounded by a number of peripheral subareas. To the north and east, peripheral areas center in the Agua Fria River, Verde River, and Tonto Basin areas.

Peripheries south and east include the Safford, San Pedro, Tucson Basin, and Upper Santa Cruz areas. To the west and south, peripheral areas include the Gila Bend area and the eastern and western subdivisions of Papaguería where the western end of the Project Area is located. Evidence of Hohokam influence can be found archaeologically beyond this main area of occupation, including along the Arizona and California sides of the lower Colorado River where small quantities of red-on-buff ceramics have been observed. While the presence of Hohokam artifacts in these distant regions does not indicate the presence of Hohokam settlements, they do provide evidence of long-distance social connections, exchanges of information, and participation in regional social networks.

The Hohokam cultural tradition is distinguished by the development of hierarchical settlement systems; large-scale irrigation agriculture; production of red-on-buff pottery; highly stylized artifacts made of shell, stone, and bone; wide-ranging trade networks; a highly developed burial ritual involving cremations; and the development of public architecture that included ballcourts and platform mounds. The sequence is defined archaeologically into four general periods: Pioneer (AD 300 to 750), Colonial (AD 750 to 950), Sedentary (AD 950 to 1150), and Classic (AD 1150 to 1450) (Haury 1976).

The Pioneer Period is distinguished by the introduction of red ware and, somewhat later, red-on-buff pottery, and by the establishment of the first large, nucleated villages with plazas along the Gila and Salt rivers (Gregory and Huckleberry 1994). This was followed by a rapid expansion of irrigation systems and habitation centers across the river basins during the Colonial Period (Doyel 1991). The Colonial Period was also characterized by increasing social complexity. Pithouses were clustered into discrete courtyards, which, in turn, were organized into larger village segments, each with their own roasting area and cemetery (Henderson 1987; Wilcox et al. 1981). Around AD 800, ballcourts were built at a number of the largest villages (Wilcox and Sternberg 1983). The presence of the ballcourt is thought to represent the emergence of a regional system with religious, economic, and political functions, tied together by the exchange of plain and buff ware ceramics, marine shell, foodstuffs, and other items (Abbott 2001; Wilcox and Sternberg 1983).

In the Sedentary Period, settlements across the Gila-Salt Basin continued to increase in number and size. It was also a time of change when some long-time large settlements, such as Snaketown, were abandoned entirely while others, like the Grewe Site, shifted in location (Craig 2001). Many of the canal systems were reconfigured during this time (Howard 1991), with some consolidation of separate systems (Woodson 2010). The reconfiguration and expansion through consolidation coincided with a more developed settlement hierarchy in the river basins—that is, each canal system having at least one large village in addition to smaller ones (Gregory and Nials 1985). By the late Sedentary, house clusters were arranged in more formalized rectangular patterns that forecast the development of the supra-household compounds seen in the Classic Period (Wilcox et al. 1981).

The Classic Period is marked by dramatic changes in Hohokam material culture, architecture, and traditions. Surface adobe-compound architecture appeared for the first time, supplementing, but not replacing, the tradition of semi-subterranean pithouse architecture. Burial modes also changed, with an increasing dominance of inhumation over cremation burial. Buff ware pottery diminished in frequency during the period and was replaced by red ware pottery and, later, polychrome types. Ballcourts were largely abandoned during the late eleventh century (Wallace et al. 1995), and sometime around the late thirteenth century (Gregory 1987), large earthen features called platform mounds replaced ballcourts as the principal form of public architecture. Adobe roomblocks served as the principal form of residence, often surrounded by massive compound walls.

Large irrigation communities spaced at regular intervals along the canal systems were prevalent in the Salt and Gila river valleys. Casa Grande Ruins, Arizona's most famous prehistoric landmark, was a four-story structure and the downstream terminus and largest settlement along a 20-mile canal that originated east of present-day Florence (Laurenzi 2012). Because construction of these features required considerable levels of organized labor, many think the mounds and canal systems are symbols of a socially differentiated society (Doelle et al. 1995; Elson 1998; Fish and Fish 1992; Gregory 1987).

Most notable during this period is the overall aggregation of Hohokam villages into fewer, but larger, villages found primarily along the middle Gila and lower San Pedro rivers and McClellan Wash and Santa Cruz Flats areas (Laurenzi 2012). Beginning in the early fourteenth century, population declined steadily in most areas, and by the mid-to-late fifteenth century, the manifestations of what are recognized as Hohokam disappeared from the archaeological record (Hill et al. 2004). To date, few archaeological sites dating to the period between the collapse of Hohokam society and the arrival of the Spanish in southern Arizona have been found or investigated. However, some modern-day Indian tribes consider themselves among the descendants of the Hohokam, including the O'odham and several clans of the Hopi and Zuni Tribes. Many traditional histories also maintain that although the political structure of Hohokam society may have dissolved, the people themselves persisted and thrived throughout the Protohistoric Period and continue to occupy the region today (Loendorf and Lewis 2011; Wells 2006).

Patayan Tradition (AD 700 to AD 1900s)

Contemporary with the Hohokam, the Patayan cultural tradition of the Lower Colorado River basin and Papaguería appears in the first millennium AD. The Patayan practiced a mix of floodwater farming and gathering of wild foods (Stone 1991). In the Papaguería, Patayan populations placed a higher value on wild food gathering than Hohokam populations; as a result, Patayan settlements were of a more seasonal nature than settlements in the Hohokam core area (McGuire and Schiffer 1982). The Patayan culture is believed to have originated in southern California and extended across the Lower Colorado River Basin and Papagueria. Evidence of the Patayan has been documented in the archaeological record across the southern California desert regions as far as the Sierra Pinacate, Mexico, to the south; the Gila Bend area to the east; and the Parker area to the north (McGuire and Schiffer 1982; Rogers 1945; Stone 1986, 1991), although expressions of the Patayan are not strictly limited to this area.

The Patayan cultural tradition is characterized by riverine-oriented agricultural villages and seasonal camps away from the river (Baker 2004). Architectural styles varied and include masonry surface structures, timber framed pithouses, and ephemeral brush shelters. Trails, shrines, roasting pits, and geoglyphs, also referred to as intaglios, are common Patayan features encountered across the landscape. Many of these intaglios were documented and studied by BLM Yuma District archaeologist Boma Johnson, who noted that Yuman people descended from the Patayan continued the tradition of creating geoglyphs (Johnson 2003:160).

Patayan farmers relied on seasonal inundation of the river flood plains, in contrast to the canal irrigation used by the Hohokam. Subsistence included procurement of a variety of game animals, fish, and wild floral resources. Patayan material culture included plain brown wares, buff wares, and red-on-brown wares manufactured using a paddle-and-anvil technique; groundstone milling equipment; and utilitarian flaked stone tools. Following AD 700, Patayan cultural development is defined archaeologically by three periods: Patayan I (AD 800 to 1000); Patayan II (AD 1000 to 1500); and Patayan III/Yuma (AD 1500 to 1900). The latter segment of this temporal sequence extends into the Historic Period. There is direct cultural continuity demonstrated between the cultural attributes of the Patayan and the historic/modern-day Yuman Indian Tribes, specifically the Mohave, Quechan, Cocopah, Paipai, and Yavapai (Johnson 2003: 160). As discussed by Johnson, the sacred Patayan geography demonstrated by geoglyphs, trails, and rock art is shared by today's native Yuman communities. Today's Mohave and Quechan people also identify themselves as descendants of the Patayan.

Ethnohistoric/Historic Period (AD 1500 to 1900s)

Detailed overviews of the ethnohistoric/historic period are provided in prior transmission line cultural resources studies through the area (Bean et al. 1978; Carrico and Quillen 1982; Dobschuetz et al. 2007). The following paragraphs, from *A Cultural Resource Survey of Tower Locations and Associated Spur Roads for the Devers-Palo Verde No. 2, Maricopa and La Paz Counties, Arizona* (Dobschuetz et al. 2007:11–12) and the Devers–Palo Verde 2 EIS provide a brief description of the cultural development and events during this period.

> The Colorado River terraces were used by several groups such as the Mohave, Panya, Quechan, and possibly Cocopah (Bean et al. 1978). According to Bean et al. (1978), the Panya moved east to the Gila River, leaving a gap that was filled by the Mohave and Quechan people. The Western Yavapai gradually took control of the study area.
>
> Carrico and Quillen (1982) provide a lengthy description of the ethnobotany of the Western Yavapai. Their report provides a detailed description of the hunting and gathering subsistence strategies employed by the Western Yavapai during the nineteenth century. Limited agriculture was incorporated into their subsistence pattern. According to Carrico and Quillen (1982), most of the seeds that were used in the limited agriculture were obtained from the Quechan.
>
> A variety of natural resources were available for exploitation including mescal, mesquite, screw bean, saguaro, paloverde, and ironwood. The harvest time for each of the above-mentioned resources are primarily July and June with the exception of ironwood, which has a September harvest.
>
> Spanish explorers traveled southern Arizona during the sixteenth through the eighteenth centuries. Within the Project Area, the Spanish explorer Juan de Onate traveled the Colorado River in 1604 (Walker and Bufkin 1979). Early explorers were lured to the area by a desire for vast wealth, springing from the legendary Seven Cities of Cibola (Whittlesey et al. 1994).
>
> Historic land use activities within the Project Area are primarily associated with mining with some marginal homesteading. Mining in Arizona began in the 1850s,

but the mining boom was heaviest in the 1870s and 1880s. The need to service the mining towns created several stagecoach and freight companies during this time. Steamboats used the Colorado River for transportation between 1852 and 1909 with several different ports along the way, but La Paz was the central port until the river shifted and Ehrenberg became the central port.

The construction of the railroads across Arizona greatly increased the overland transportation of goods and people. Railroads began to be constructed in Arizona between 1877 and 1890. These first routes include the Southern Pacific railroad along the southern part of Arizona extending from El Paso through to Yuma, and the Atchinson, Topeka & Santa Fe, which extends west from Albuquerque toward California.

Mining is an important aspect of Arizona's history. Several different commodities were identified within Arizona mines including copper, gold, silver, lead, zinc, iron, uranium, manganese, tungsten, and mercury. Although the state of Arizona has recorded over 400,000 mines, there is one particular mining district in close proximity to the proposed route—the La Paz (Weaver) Mining District. This district includes most of the Dome Rock Mountains with the exception of the Middle Camp, Oro Fino, and La Cholla mining districts.

Quartzsite, Arizona, was founded on the location of Fort Tyson, a private fort built by Charles Tyson in 1856 to protect the area from Indian raids. The nearby Tyson's Wells was a stage station on the road between Ehrenberg and Prescott. The opening of the Bradshaw Trail, a stagecoach running into the region from the east, in 1862, facilitated movement into the area. This trail was part of a route that followed water sources along the southern pediments of the Orocopia, Chuckwalla, and Mule Mountains. The trail was originally introduced to early explorer William Bradshaw by Cabezon, a Torres Martinez Cahuilla man (George Kline, personal communication, 2018). In California, the Bradshaw Trail was used to transport ores and metals to markets in the coastal cities. By 1877, the Southern Pacific Railroad had been completed, thus making movement into the area even more convenient, and the Bradshaw Trail was used sporadically afterward. A small mining boom in 1897 necessitated the opening of a short-lived post office in Tyson's Wells. Later, the post office was reopened, although because of regulations prohibiting the re-use of names, Tyson's Wells could not be used. At this time the town name Quartzsite was adopted.

The town of Blythe grew out of agricultural development in the Palo Verde Valley that began in 1877 when the first primary water rights to the Colorado River in the region were filed. The California Southern Railroad reached the town in 1916, boosting economic growth in the area. Blythe was eventually incorporated in 1921. The town's economy was further enhanced by the construction of the first bridge over the Colorado River between Blythe and Ehrenberg in 1928 as part of US Highway 60 (US 60), and later the establishment of I-10 in 1973.

The Kofa NWR was established in 1939 and is managed by the USFWS. The refuge encompasses 665,400 acres of desert that is home to a wide variety of plant and animal species, including the desert bighorn sheep and the California palm (the only native palm in Arizona). In the early part of this century, a number of mines were established in the mountainous areas of the refuge. One of the most notable was the King of Arizona mine. It gave the Kofa Mountains their name; "Kofa" being contracted from King of Arizona.

The western end of the Project Area, generally west of the Copper Bottom Pass, was within the training area of General George Patton during World War II. Patton's Desert Training Center, California-Arizona Maneuver Area (DTC-CAMA), covered large portions of the desert in California, Arizona, and Nevada. Evidence of the training exercises are still present on the landscape as part of the archaeological record, such as foxhole features, refuse dumps, camp areas, and other features related to various practice maneuvers. In addition to the DTC-CAMA, the area was subjected to military maneuvers for two weeks in 1964 during Operation Desert Strike. Because of the use of military surplus, the archaeological signature of Operation Desert Strike would be much the same as that from the DTC-CAMA, with some technological variations.

The Project Area includes a portion of the CRIT Reservation that extends south to Copper Bottom Pass. The CRIT includes four distinct tribes: the Mohave, Chemehuevi, Hopi, and Navajo. There are currently about 3,500 active tribal members. The CRIT Reservation was created in 1865 by the Federal government for "Indians of the Colorado River and its tributaries," originally for the Mohave and Chemehuevi, who had inhabited the area for centuries. People of the Hopi and Navajo Tribes were relocated to the reservation in later years. The reservation stretches along the Colorado River, north of the Project, on both the Arizona and California sides. It includes almost 300,000 acres of land, with the river serving as the focal point and lifeblood of the area. The primary community in the CRIT Reservation is Parker, Arizona, which is located on a combination of tribal land, leased land that is owned by CRIT, and land owned by non-tribal members. Other, smaller communities are on the reservation, including Poston, located 10 miles south of Parker.

Ethnohistoric/Present Day Land Use and Cultural Affiliation of Indian Tribes

As outlined above, the Project Area has traditionally been utilized by numerous Indian tribes. Given the length of the Project, these traditional boundaries in some cases overlap; however, most generally, tribal use areas can be described for the western and central/eastern portions of the Project. Based on Section 106 consultation and information provided by the Native American Heritage Commission, the following tribal associations have been defined and are discussed in greater detail below.

Eastern/Central Project Area

The central and eastern portions of the Project are in Arizona in the arid desert lands between the Colorado and Gila rivers. This hot, dry place was not conducive to large village settlements; springs, seeps, wells, and seasonal water sources are present for those familiar with the landscape. Small settlements, campsites, resource procurement areas, places of religious and ceremonial importance, rock art, and an extensive network of travel corridors cross this desert area. The eastern portion of the Project crosses ancestral lands occupied by the Yavapai, Piipaash, and O'odham, and is largely contained within the East Plains and Kofa Zone of the Project Area, with some overlap into the Quartzsite Zone.

Yavapai

Historically, the Yavapai lived in central and western Arizona. They were primarily hunter-gatherers, and also practiced agriculture, as did most Indian tribes in the Southwest (Khera and Mariella 1983). The westernmost range of the Yavapai included the mountains and sometimes lowland along the Colorado River, and as far south as Yuma. The Yavapai range also included the Colorado, Verde, and Salt rivers, which were all perennial, as well as the springs, numerous seasonal washes, and seasonal tanks of water–*tinajas*–in the western desert region where the Project is located.

Modern Yavapai communities are located on the Yavapai-Prescott Indian Tribe reservation and the Yavapai-Apache Nation of the Camp Verde Indian Reservation. Both are located north of the Project Area in Yavapai County, Arizona.

O'odham and Piipaash

Historically, the O'odham people lived across the western two-thirds of what is now southern Arizona and northern Sonora, Mexico. The O'odham includes several primary subgroups. The Akimel O'odham (River People) lived along the reaches of the middle Gila River. The Tohono O'odham (Desert People) resided farther south from Tucson to Yuma. The Sobaipuris were east in the San Pedro River Valley. The O'odham were sedentary agriculturists practicing various forms of farming as their primary subsistence. Today, the O'odham live on the Gila River Indian Community, the Salt River Pima-Maricopa Indian Community, the Ak-Chin Indian Community, and the Tohono O'odham Nation in Maricopa and Pinal Counties, Arizona.

The Piipaash, sometimes referred to as the Maricopa, is a Colorado River Tribe that moved up to the middle Gila due to conflicts with their river neighbors in the seventeenth and eighteenth centuries. The Piipaash language is closely related to the Quechan and Mojave. These three languages are generally considered members of the river branch of the Yuman language family (Joel 1964). The Piipaash now reside primarily on the Gila River Indian Community and the Salt River Pima-Maricopa Indian Community in Maricopa and Pinal Counties, Arizona.

Modern Tribal Affiliations for the Central/Eastern Project Area:

- Yavapai (represented by the Yavapai Apache Nation and the Yavapai-Prescott Indian Tribe)
- Piipaash (represented by the Salt River Pima-Maricopa Indian Community and the Gila River Indian Community)
- O'odham (represented by the Salt River Pima-Maricopa Indian Community, the Gila River Indian Community, the Ak-Chin Indian Community, and the Tohono O'odham Nation)

Western Project Area

The western portion of the Project is in California and Arizona along the fertile lands of the Colorado River and adjoining plains and mountains. This area was conducive to large village settlements and prehistoric agriculture, and, as such, was home to numerous Indian groups throughout prehistory and history.

The western portion of the Project crosses ancestral lands occupied by the Cahuilla, the Chemehuevi, the Halchidhoma, the Mohave, and the Quechan. It roughly corresponds to the Quartzsite, Copper Bottom, and Colorado River and California Zones of the Project Area.

Cahuilla

The Cahuilla people are the native inhabitants of the Coachella Valley and surrounding mountains. The Cahuilla landscape included the territory from the Orocopia Mountains in the east to San Gorgonio Pass and the area near Riverside. Anthropologists have subdivided the Cahuilla into three geographical divisions: the Mountain, Pass, and Desert Cahuilla. The Desert Cahuilla lived closest to the Project Area in the Coachella Valley, Chuckwalla Valley, and areas west of the Colorado River.

Traditional subsistence patterns involved the movements of parts of the Cahuilla community to areas where they would collect and harvest plant resources as they became available. The Desert Cahuilla gathered wild plant foods from the lowland environments, in particular, honey mesquite, screwbean, cactus fruit, agave, yucca, and certain grass seeds (Bean 1978:578). Upland excursions were focused on harvesting key nut crops, including acorns and pinyon pine nuts. Both nut crops were storable and could last for many months (AECOM 2012:12-14; Lerch et al. 2016:20).

The Cahuilla also hunted various game animals, including rabbit, deer, and bighorn sheep. Large game was typically hunted with bow-and-arrow, sometimes with the aid of blinds or deer-head decoys (Bean 1978:578). Small game was shot with bow and arrow, stunned and killed by throwing sticks, or captured with snare, trap, or deadfall. Hunting could be an individual or group pursuit, and large groups of people occasionally came together to participate in communal hunts. Fishing was also carried out with hook and line, nets, basketry traps, spears, bow and arrow, and vegetal poisons (Lerch et al. 2016:20).

Pre-contact Cahuilla settlement patterns appear to have incorporated semi-permanent village sites situated near reliable sources of water. The location and size of villages varied across environmental zones. Available water sources included streams in the foothills and permanent water sources on the desert floor or in areas where wells could be easily dug (Bean 1978:575; Lerch et al. 2016:20). Villages consisted of loose clusters of houses and at least one large ceremonial center. These sites were occupied year-round by a single lineage group and could be connected by a complex system of trails (Bean 1972:72-74; Lerch et al. 2016:20). Springs and resource patches might be owned by a specific lineage. Additionally, by 1824, the Desert Cahuilla were practicing irrigation agriculture and growing foods similar to the Colorado River Yuman groups. Those foodstuffs included maize, beans, squash, pumpkins, melons, and wheat (AECOM 2012:13-14).

The Cahuilla were avid traders and exchanged food, utilitarian items, and ceremonial items with their neighbors. Generally, obsidian, furs, hides, nuts, and seeds moved west, while shell beads, tourmaline, steatite, asphaltum, sea-otter pelts, and dried fish moved east (Bean 1972:68-74; Lerch et al. 2016:22). The Coco-Maricopa Trail connected southern California with the Southwest and brought turquoise, pottery, grooved axes, and agricultural products to the region.

Many rituals were prominent in Cahuilla life, and both Strong (1929) and Bean (1972) have identified at least 10 or more types of rituals. The most important of these ceremonies were the annual mourning ceremony, eagle ceremony, rites of passage (particularly birth, naming, adolescent initiation, and marriage), status changes of adults, and increase rites (inducing supernatural beings to provide increased number of animals or plants, ensuring an adequate and abundant food supply). The emphasis in many of these rituals was the performance of song cycles, setting the place of the Cahuilla in the universe and affirming the relationship of the past to the present, one to another, and to all things (AECOM 2012:12-14).

There are nine modern Cahuilla Indian Nations: the Torres Martinez Desert Cahuilla Indians, Cabazon Band of Mission Indians, the Augustine Band of Cahuilla Indians, Agua Caliente Band of Cahuilla Indians, Morongo Band of Mission Indians, Cahuilla Band of Mission Indians, Ramona Band of Cahuilla Indians, Santa Rosa Band of Mission Indians, and Los Coyotes Band of Cahuilla Indians. Historically, all spoke the Cahuilla language, had similar lifestyles, and practiced the same cultural traditions.

Chemehuevi

The traditional territory of the Chemehuevi included an expanse of land within the eastern Mojave Desert stretching from the Colorado River westward to the Kingston Range, through Providence Mountains, to approximately the modern-day boundaries of Riverside and Imperial Counties in California (Lerch et al. 2016:22). Kroeber (1925:595) noted that this was the largest piece of land inhabited by any single ethnolinguistic group in California, and also one of the most thinly populated. He estimated that between 500 and 800 Chemehuevi were living within their territory during prehistory (Kroeber 1925:595). Californian ethnographers Bean and Vane disagree with Kroeber's population estimate and argue that a minimum of 13,000 Chemehuevi inhabited a territory from what is now Las Vegas south to the Palo Verde Valley, and from the Colorado River into the Iron Mountains (Bean and Vane 1978:5–20). Consultation received from the Twenty-Nine Palms Band of Mission Indians, which include the Chemehuevi, refer to the larger area of Chemehuevi occupation as the "Chemehuevi Traditional Use Area," (Madrigal [Twenty-Nine Palms Band of Mission Indians] to Macdonald [BLM], 10/6/2016; 5/12/2017). The exact limits of the Chemehuevi Traditional Use Area have not yet been identified by the tribe.

The Chemehuevi practiced a foraging subsistence strategy adapted to an arid desert environment with marked seasonal variability in the availability of food. They were hunter-gatherers who moved seasonally to exploit differential availability of key economic plant and animal resources. A wide variety of resources were utilized, including deer, rabbits, reptiles, pinyon, honey mesquite, screwbean, desert greens, agave, cacti, and other succulents. More permanent settlements were located near reliable sources of potable water. Hunting parties traveled to more distant upland areas to acquire bigger game animals, principally bighorn sheep and deer. Antelope and jack rabbits were also hunted communally with drives using lengthy nets and constructed diversion fences. The Chemehuevi also collaborated with neighboring tribes in the pursuit of large game. Hunting parties traveled to the San Bernardino Mountains for cooperative efforts with their allies, the Serrano and Vanyume (AECOM 2012). Foods had to be stored to survive the winter and early spring months (Kelly and Fowler 1986:370).

Seasonal mobility was essential to the Chemehuevi way of life. Plant food sources were temporally and spatially variable in abundance. From spring through fall, individual families or small family clusters foraged in groups, moving according to the availability of plants. During the winter, the Chemehuevi aggregated in villages of several families, located near their caches of stored food (Kelly and Fowler 1986:371; Lerch et al. 2016:23). Harvesting pinyon was an important winter activity.

Because resources were widely scattered across the landscape, a group's composition in any given year was dependent on who chose which patch of land. Related families tended to dwell in proximity and cooperated in hunting and gathering activities. Among the Chemehuevi, springs were considered private property. Chemehuevi men could also inherit rights to hunt large game within certain tracts of territory. These tracts were defined in songs, and one had to have the proper song, or be with one who did, in order to hunt these areas (Laird 1976; Lerch et al. 2016:24).

By the time of the first Euro-American explorers, the Chemehuevi were living on irrigated horticultural lands along the Colorado River. In this part of their territory, their numbers were greater and permanent villages existed. The Chemehuevi may have adopted this pattern of floodplain agriculture from the Mohave. Agricultural food plants included gourds, winter wheat, yellow maize, and certain cultivated grasses (Kelly and Fowler 1986:371). Farming was supplemented by wild plants including the collection of blazing star, chia, rice grass, goosefoot, pinyon pine nuts, and acorns.

Historical accounts suggest that the Chemehuevi belief systems include a form of shamanism where power was bestowed upon a person through dreams. A prospective shaman would be visited in his dream by one or more guardians—usually in animal form—who would give him instructions, teach him songs, and bestow upon him shamanistic power (Kelly and Fowler 1986:383). The songs passed on through dreams were, and remain, of great importance culturally and include the Funeral, Deer and Mountain Sheep, Bird, Salt, Quail, and Coyote songs. These songs are generally descriptions of travels, complete with place names, important landmarks, and descriptions of the natural environment. The recitation of important songs is common at Chemehuevi cultural events.

Three modern Chemehuevi populations live in proximity to the Project Area. Modern populations and reservation lands include the Twenty-Nine Palms Band of Mission Indians, the Chemehuevi Indian Tribe of the Chemehuevi Indian Reservation, and the CRIT.

Halchidhoma

Halchidhoma populations lived along the Colorado River between what is now known as Blythe and Needles, Riverside County, California, and above Parker, La Paz County, Arizona, until about 1825. The Halchidhoma are Yuman speakers, and closely related with other Yuman groups, such as the Mojave, Quechan, and Piipaash. In his expeditions of 1604-1605, Oñate identified eight villages on the Colorado River, south of the Gila River in the vicinity of modern-day Yuma, with 160 homes and a population at the northernmost village alone approximating 2,000 people (Kroeber 1925:802). The Quechan and Mojave drove the Halchidhoma from the area and forced them to migrate to the east (Kroeber 1925). The Halchidhoma ultimately joined the Piipaash at the confluence of the Salt and Gila rivers in southern Arizona (Kroeber 1925:801; Harwell and Kelly 1983:71).

Similar to other Indian groups who lived along the lower Colorado River, the Halchidhoma were horticulturalists who practiced dry farming supplemented by foraging. They lived in hamlets on large habitation spaces located on river terraces above the floodplain. Villages were regularly relocated when the river changed course. Plantings were made after the floodwaters receded (AECOM 2012:17-19).

When floods were at their peak, areas of the Palo Verde Valley and Cibola were inundated. As the floodwaters declined during the summer, seed crops could be planted. Maize, tepary beans, black-eyed beans (cowpeas), squash, and pumpkins were standard foodstuffs. Wild supplements included mesquite and screwbean harvests. Mesquite pods could be eaten fresh from the tree but more commonly were harvested in July or gathered after falling to the ground. The pods were then milled into flour and processed using wooden mortars and pestles of wood or stone (Castetter and Bell 1951; Gifford 1931).

Seeds of the ironwood tree and the Palo Verde tree were also regularly gathered. Both plants are drought-tolerant species that inhabit areas away from the river and therefore would have been reliable food sources even in years of crop failure. Seeds would be removed, parched, ground on a milling slab, and leached to remove the bitter taste. Ironwood seeds were also roasted and made into a meal that was fashioned into thin loaves and baked.

Anthropologists have documented that the Halchidhoma participated in extensive long-distance trade, particularly with the Cahuilla, Hualapai, Tohono O'odham, and Akimel O'odham people (Bean and Vane 1978). Of particular importance was the Coco-Maricopa Trail, a prominent travel corridor that leads west and southwest from the Colorado River near Blythe to the Pacific Coast. Reed rafts or swimmers were used to ferry goods across the river. Palo Verde Peak, one of the three primary mountains, or "Big Houses," of the Yuman *Xam Kwatcan* Trail is associated with the Halchidhoma and located to the south of the Project (Johnson 2003: 163). The *Xam Kwatcan* Trail intersects with a network of other trails that originate from CA-RIV-773 on the northern pediment of the Mule Mountains (George Kline, personal communication, 2018).

Today, along with the Piipaash, the Halchidhoma are part of the Salt River Pima-Maricopa Indian Community located in the metropolitan Phoenix, Arizona area (AECOM 2012).

Mohave

The ancestral Mohave territory encompassed riverine and inland areas. Riverine settlements were concentrated north of the Bill Williams River up to the southern Nevada border and extended down both sides of the lower Colorado River (Stewart 1983:55). The historical record also indicates that the Juan de Oñate expedition encountered the Mohave in 1604 as far south as the present CRIT (Stewart 1969:257-276), and that they intermittently controlled areas as far south as Palo Verde Valley. After the Halchidhoma exited the Parker-Blythe region during the period from 1825 to 1830, the Mohave briefly took up residence in the area, but they ultimately returned to their central homeland in the Mohave Valley north of the Project Area (Bean and Vane 1978).

The Mohave employed a mixed subsistence strategy partially dependent on agriculture crops such as maize, tepary beans, pumpkins, and melons, with maize being of primary importance. Sedentary farming villages were made possible by the flooding of the lower Colorado River in the late spring. When the floodwaters receded, they left behind a rich silt that required no fertilization or irrigation (Lerch et al. 2016). Cultigens were supplemented by wild native plants, including honey mesquite, screwbean, and pinyon; hunting; and fishing. Men typically cleared and burned the land before the flooding began and women did most of the planting, cultivating, harvesting, and storage (Stewart 1983:58). Mesquite and screwbean plants produced seedpods that could be eaten green but were typically processed with a wooden mortar and a stone or wooden pestle. Spring was considered the preferred time to obtain game animals, and rabbits were taken with traps and communal netting. Fish was the most important protein source for the Mohave, with dip nets, drag nets, traps, and large basketlike scoops used to catch fish out of the river (Kroeber 1925; Stewart 1957).

The Mohave lived in sprawling settlements, scattered throughout the valleys on low rises above the floodplain. Permanent settlements were only occupied during the winter and spring flooding seasons. During the summer and fall, family groups dispersed to the bottomlands to live in temporary camps. Several extended families occupied each settlement, and each household was composed of an extended family and related, unmarried adults (Stewart 1983:57; Lerch et al. 2016:26). The extended family formed the basic cooperative unit of subsistence, although several families might pool labor to clear land, weed, or harvest.

Cultivated land could be considered private property among the Mohave. Any tract of land that was not in use could be cleared and planted, becoming the property of the man who performed the labor (Stewart 1983:59; Lerch et al. 2016:26). These plots were not inherited after death but were abandoned.

In addition to their local economy, the Mohave participated in a formalized long distance trade network that extended as far east as the Hopi town of Oraibi in Arizona; and as far west as the Chumash villages on the Pacific Coast, an established trade route known as the Mohave Trail. Known for their stamina as runners, the Mohave men would travel at night, with a typical journey to the coast from the Colorado River lasting approximately 15 days (Bean and Vane 1978; McCawley 1996).

Traditional Mohave religion emphasizes the importance of dreams and their role as the connection between the natural and spiritual worlds. Every Mohave was recognized as having an ability to connect with the spirit world through dreams, which were seen as a means of traveling or journeying back through time. During these travels, the Mohave would see important places and identify geographical locations where certain important springs or mountains were situated (AECOM 2012).

Interpretation of these dreams affected nearly all facets of life and behavior. Stewart (1983:65) describes dreams as having a "pivotal concept in their culture as a whole, permeating almost every phase of Mojave thought and endeavor. All special talents and skills, and all noteworthy successes in life, whether in warfare, lovemaking, gambling, or as a shaman, were believed to be dependent upon proper dreaming."

The learning of songs was (and continues to be) an important aspect of religious belief and practice. Sacred songs about the events that occurred at the time of the creation of the world were learned through dreaming. Sacred places could be visited and sacred landscape traversed through the dreaming experience rather than through conventional travel. Physical travel along trails to sacred places was also an important aspect of the religious experience. Travel on key Indian trails continues to be a cultural practice today to commemorate and experience traditional culture (AECOM 2012:24-25). The geography of sacred places related to the sacred song cycles of Yuman groups is a major cultural feature of the lower Colorado River region. Kroeber (1925:786) collected large quantities of information on places mentioned in Mohave song cycles, from as far afield as the Pacific Ocean and the Tehachapi Mountains, the Gulf of California, Tucson, and southern Nevada.

Descendants of the Mohave reside on or near two reservations located on the Colorado River, the Fort Mojave Indian Reservation and the CRIT. Fort Mojave is headquartered north of the Project Area in Needles, Riverside County, California. The CRIT is both within and adjacent to the Project Area. It is headquartered in Parker, La Paz County, Arizona.

Quechan

Quechan territory is now divided by the states of Arizona and California and is located near the confluence of the Gila and Colorado rivers. Their traditional territory ranged from the modern City of Blythe south to the current international border. Four to six locations were identified as ethnohistoric Native villages, all situated along the lower Colorado River. In proximity to the Project Area, *Avi Kwotapai* was located between the Palo Verde Valley and the modern City of Blythe on the west side of the Colorado River; *Xenu mal vax* was located near the contemporary town of Ehrenberg on the east side (AECOM 2012).

The Quechan subsisted primarily on domesticated cultigens, wild plants, and fish (Bee 1983; Forde 1931). Domesticated cultigens were planted in the rich silt of the Colorado River floodplain and included maize, tepary beans, watermelon, black-eyed beans, pumpkins, and muskmelons. In the historic era, winter wheat was added to the diet. Seine nets were used when the water was low enough to catch razorback, sucker, pike minnow, and bonytail chub from the Colorado River (AECOM 2012). Wild edible plants like mesquite pods and screwbeans were also gathered to supplement the diet. The pods could be crushed and eaten, ground into flour and formed into cakes, or steeped in water as a beverage.

Quechan settlements were separated into a series of dispersed villages scattered across the flood plain of the Colorado River (Bee 1983:87-88). The boundaries and sizes of these villages changed throughout the year. During winter months, people congregated on the high points of the floodplain while the river was in flood stage. As the river subsided and the planting season began, people dispersed into the bottomlands to tend the crops. During harvest time, people again aggregated into denser concentrations. The locations of the villages varied through time (Lerch et al. 2016:31)

Similar to the Mohave, Quechan traditional religious beliefs involved the acquisition of spiritual power derived from special dreams and continuing interaction with the souls of the dead. This dream power is bestowed by the first people, created by *Kukumat* (Creator), but imbued with spiritual power through *Kukumat*'s son *Kumastamxo*. Dream power was critical to an individual's success. Traditionally, the Quechan also had guardian spirits identified by the unique voices that spoke to them from time to time. Spirits and agents of the ancient ones, the first people, reside on the sacred mountain of *Avikwame* or other prominences in their territory. Only special speakers or singers had esoteric knowledge of religious matters. The singular collective tribal ritual where these religious specialists held sway was the *karuk*. This Mourning Ceremony was fashioned to revere relatives who had passed away. The ritual was recognized as a reenactment of the original Mourning Ceremony following the Creator's death (AECOM 2012).

The Quechan community is now mostly concentrated on the Fort Yuma-Quechan Reservation, located along the lower Colorado River in Arizona and California. The Quechan reservation is within their ancestral homeland.

Modern Tribal Affiliations for the Western Project Area:

- Cahuilla (represented by the Torres Martinez Desert Cahuilla Indians, Cabazon Band of Mission Indians, Agua Caliente Band of Cahuilla Indians, Augustine Band of Cahuilla Indians, Morongo Band of Mission Indians, Cahuilla Band of Mission Indians, Ramona Band of Cahuilla Indians, Santa Rosa Band of Mission Indians, and Los Coyotes Band of Cahuilla Indians)
- Chemehuevi (represented by the CRIT, Twenty-Nine Palms Band of Mission Indians, and the Chemehuevi Indian Tribe)
- Halchidhoma (represented by the Salt River Pima-Maricopa Indian Community)
- Mohave (represented by the Fort Mojave Indian Tribe and the CRIT)
- Quechan (represented by the Fort Yuma Quechan Tribe).

These Indian tribal groups have occupied the landscape of the Project Area throughout the prehistory into the modern day. Their footprint on the landscape is visible in the material remains contained in cultural resource sites. However, their ties to places may not be tangible in all cases. In addition to more traditionally defined sites that may be evaluated under the NRHP criteria for eligibility, other types of cultural resources of potential cultural and religious significance to Indian tribes include ceremonial locations, historical habitation sites, trails, burials/cremations, and others. These are discussed in Section 3.7.3.2.

3.6.3.2 Zone-Specific Conditions

Within each of the four zones, individual segments are discussed in terms of previously conducted cultural resources investigations and known cultural resources by the two Class I inventory tiers of a 1-mile-wide corridor and a 200-foot-wide corridor, encompassing the Proposed and Alternative Segments.

A total of 918 cultural sites were identified by the Class I investigations (606 in Arizona and 312 in California). The NRHP status of these sites is detailed in Tables 3.6–1 and 3.6-2.

Previous survey coverage of the 1-mile-wide and 200-foot-wide corridor were used to provide calculations for existing survey coverage and project site densities per 100-acre unit to provide a measure of comparison between zones and individual segments. The discussion below is based on cultural resources data collected by HDR and presented in Brodbeck et al. (2017).

Table 3.6-1 Cultural Sites per NRHP Eligibility by Site Type in Arizona (All Segments, 1-Mile-Wide Corridor)

ELIGIBILITY[1]	HISTORIC	PREHISTORIC	MULTI COMPONENT	UNKNOWN CHRONOLOGY	TOTAL
NRHP-listed	0	0	0	0	0
Determined eligible	1	2	0	10	13
Recommended eligible	5	6	0	33	44
Determined ineligible	1	0	0	11	12
Recommended ineligible	1	0	0	0	1
Unevaluated/ Unknown	19	158	2	357	536
Total	27	166	2	411	606

[1]Recommended= recorder's opinion. Determined=agency determination.

Table 3.6-2 Cultural Sites per NRHP Eligibilities by Site Types in California (All Segments, 1-Mile-Wide Corridor)

ELIGIBILITY[1]	HISTORIC	PREHISTORIC	MULTI COMPONENT	UNKNOWN CHRONOLOGY	TOTAL
NRHP-listed	0	0	0	0	0
Determined eligible	0	4	3	0	7
Recommended eligible	0	2	3	0	5
Determined ineligible	106	36	16	0	158
Recommended ineligible	0	0	0	0	0
Unevaluated/ Unknown	64	64	13	1	142
Total	170	106	35	1	312

[1]Recommended= recorder's opinion. Determined=agency determination.

East Plains and Kofa Zone

The East Plains and Kofa Zone includes Proposed Action Segments p-01, p-02, p-03, p-04, p-05, and p-06; and Alternative Segments d-01, i-01, i-02, i-03, i-04, in-01, x-01, x-02, x-03, and x-04. These are discussed in more detail by segment below.

A complete discussion of the results of a Class I inventory for each segment is presented in Brodbeck et al. (2017). Tables 3.6-3 and 3.6-4 summarize the previous survey coverage and site density within the 1-mile-wide and 200-foot-wide corridors, respectively. Tables 3.6-5 and 3.6-6 summarize the NRHP eligibility of those sites within the 1-mile-wide and 200-foot-wide corridors, respectively. The descriptions below these tables summarize site types within the 1-mile corridor of each segment.

Table 3.6-3 Previous Survey Coverage and Cultural Resources Identified Within a 1-Mile-Wide Corridor along Segments in the East Plains and Kofa Zone

SEGMENT	AREA[1] (ACRES)	PREVIOUS SURVEY COVERAGE (ACRES)	PREVIOUS SURVEY COVERAGE (%)[2]	TOTAL # OF SITES	SITE DENSITY (# PER 100 ACRES SURVEYED)
Proposed Action Segments					
p-01	16,812.2	10,804.6	64.3	25	0.2
p-02	679.8	731.4	107.6[1]	9	1.3
p-03	1,332.5	323.0	24.2	8	2.5
p-04	3,544.7	675.5	19.1	20	3.0
p-05	1,262.5	178.1	14.1	3	1.7
p-06	22,844.7	3,419.4	15.0	55	1.6
Alternative Segments					
d-01	16,296.6	1,743.1	10.7	17	1.0
i-01	5,333.6	2,051.7	38.5	6	0.3
i-02	2,109.2	218.8	10.4	0	0.0
i-03	12,771.6	2,395.8	18.8	16	0.7
i-04	6,655.7	1,428.3	21.5	5	0.4
in-01	8,811.7	2,319.4	26.3	15	0.6
x-01	5,063.7	4,809.0	95.0	8	0.2
x-02	4,310.3	1,598.2	37.1	5	0.3
x-03	3,605.1	117.3	3.3	1	0.9
x-04	14,491.2	1,396.8	9.6	11	0.8
SCS Distribution Line (20-foot-wide corridor)					
12kV Line	3.1	2,437.3	290.2	11.9	4

[1]Segment area calculated using line miles and one-mile corridor width.

[2] Percentages represented in the table represent the sum total of acres previously surveyed and does not account for overlapping project areas. Consequently, some calculations of coverage are greater than 100 percent, as they have resulted in more acreage than comprises the segment corridor.

Table 3.6-4 Previous Survey Coverage and Cultural Resources Identified Within a 200-Foot-Wide Corridor along Segments in the East Plains and Kofa Zone

SEGMENT	AREA[1] (ACRES)	PREVIOUS SURVEY COVERAGE (ACRES)	PREVIOUS SURVEY COVERAGE (%)	TOTAL # OF SITES	SITE DENSITY (# PER 100 ACRES SURVEYED)
Proposed Action Segments					
p-01	643.2	300.3	46.7	10	3.3
p-02	26.1	3.5	13.5	3	85.7
p-03	50.8	7.5	14.7	0	0.0
p-04	115.7	30.0	26.0	7	23.3
p-05	68.0	12.1	17.9	3	24.8
p-06	865.9	205.7	23.8	17	8.3
Alternative Segments					
d-01	612.8	35.1	5.7	2	5.7
i-01	205.0	21.2	10.3	2	9.4
i-02	77.5	0.0	0.0	0	0.0
i-03	488.1	20.6	4.2	4	19.4
i-04	256.1	5.0	1.9	0	0.0
in-01	337.5	6.6	2.0	2	30.3
x-01	195.1	3.9	2.0	1	25.6
x-02	164.0	7.1	4.3	0	0.0
x-03	137.3	2.3	1.7	0	0.0
x-04	549.7	24.2	4.4	1	4.1
SCS Distribution Line (20-foot-wide corridor)					
12kV Line	7.6	0.4	5.3	0	0.0

[1]Segment area calculated using line miles and 200-foot corridor width.

Table 3.6-5 NRHP Eligibility of Sites within the 1-Mile-Wide Corridor along Segments in the East Plains and Kofa Zone

SEGMENT	DETERMINED ELIGIBLE	RECOMMENDED ELIGIBLE	DETERMINED INELIGIBLE	RECOMMENDED INELIGIBLE	NOT EVALUATED/ UNKNOWN	TOTAL # OF SITES
Proposed Action Segments						
p-01	4	1	13	0	7	25
p-02	3	0	3	0	3	9
p-03	1	0	5	0	2	8
p-04	2	1	12	0	5	20
p-05	0	0	3	0	0	3
p-06	8	1	37	1	8	55
Alternative Segments						
d-01	0	1	1	0	15	17
i-01	3	0	0	0	3	6
i-02	0	0	0	0	0	0
i-03	0	2	0	1	13	16
i-04	2	0	0	1	2	5
in-01	3	3	1	2	6	15
x-01	1	0	4	0	3	8
x-02	1	0	1	0	3	5
x-03	0	0	0	0	1	1
x-04	0	0	0	1	10	11
SCS Distribution Line		**(20-foot-wide corridor)**				
12kV Line	2	0	1	1	0	4

Table 3.6-6 NRHP Eligibility of Sites within the 200-Foot-Wide Corridor along Segments in the East Plains and Kofa Zone

SEGMENT	DETERMINED ELIGIBLE	RECOMMENDED ELIGIBLE	DETERMINED INELIGIBLE	RECOMMENDED INELIGIBLE	NOT EVALUATED/ UNKNOWN	TOTAL # OF SITES
Proposed Action Segments						
p-01	0	2	1	0	7	10
p-02	1	0	1	0	1	3
p-03	0	0	0	0	0	0
p-04	2	0	4	0	1	7
p-05	0	1	2	0	0	3
p-06	4	0	11	0	2	17
Alternative Segments						
d-01	0	0	0	0	2	2
i-01	0	0	0	0	2	2
i-02	0	0	0	0	0	0
i-03	0	1	0	0	3	4
i-04	0	0	0	0	0	0
in-01	1	1	0	0	0	2
x-01	0	0	1	0	0	1
x-02	0	0	0	0	0	0
x-03	0	0	0	0	0	0
x-04	0	0	0	0	1	1
SCS Distribution Line (20-foot-wide corridor)						
12kV Line	0	0	0	0	0	0

Proposed Action Segments p-01 through p-06

Segment p-01

The Class I inventory (Brodbeck et al. 2017) results for Segment p-01 indicate that previously recorded prehistoric site types include artifact scatters of different compositions (lithics, ceramics, and groundstone), rock rings, a hearth, and milling stations. Previously recorded historic sites include a check dam, concrete block structures, and a trash dump.

Segment p-02

The Class I inventory (Brodbeck et al. 2017) results for Segment p-02 indicate that previously recorded prehistoric site types consist of artifact scatters. One historic site, a trash dump, is also present.

Segment p-03

The Class I inventory (Brodbeck et al. 2017) results for Segment p-03 indicate that previously recorded sites are all prehistoric artifact scatters.

Segment p-04

The Class I inventory (Brodbeck et al. 2017) results for Segment p-04 indicate that previously recorded prehistoric site types consist of prehistoric lithic scatters, some with rock rings and rock alignments, and trails. No information is available for one previously recorded site.

Segment p-05

The Class I inventory (Brodbeck et al. 2017) results for Segment p-05 indicate that both prehistoric and historic sites are present. Previously recorded prehistoric site types consist of a lithic scatter, and a lithic and groundstone scatter with an associated hearth. The historic site consists of rock wall structures.

Segment p-06

The Class I inventory (Brodbeck et al. 2017) results for Segment p-06 indicate that previously recorded prehistoric site types include artifact scatters, trails, rock rings, cleared circles, cairns, hearths, and petroglyphs. Previously recorded historic sites consist of the historic El Paso Natural Gas Line, historic camp sites, and trash scatters.

Alternative Segments: d-01, i-01 through i-04, in-01, x-01 through x-04

Segment d-01

The Class I inventory (Brodbeck et al. 2017) results for Segment d-01 indicate that previously recorded sites are all prehistoric, and consist of artifact scatters, trails, and a lithic quarry.

Segment i-01

The Class I inventory (Brodbeck et al. 2017) results for Segment i-01 indicate that previously recorded sites are all prehistoric artifact scatters.

Segment i-02

The Class I inventory (Brodbeck et al. 2017) results for Segment i-02 indicate that no sites have been previously identified within either the 1-mile, or the 200-foot-wide corridor of this segment.

Segment i-03

The Class I inventory (Brodbeck et al. 2017) results for Segment i-03 indicate that previously recorded prehistoric and historic sites are present. The previously recorded prehistoric sites include prehistoric artifact scatters, a rock ring, trails, and a rock alignment. The previously recorded historic sites include World War II (WWII)-era military foxholes, WWII-era bunkers, roads, and a well.

Segment i-04

The Class I inventory (Brodbeck et al. 2017) results for Segment i-04 indicate that previously recorded prehistoric and historic sites are present. The prehistoric sites include a prehistoric hearth and a prehistoric rock alignment. The historic sites are roads.

Segment in-01

The Class I inventory (Brodbeck et al. 2017) results for Segment in-01 indicate that previously recorded prehistoric and historic sites are present. The previously recorded prehistoric sites include rock rings, alignments, rock piles, and cleared circles. Previously recorded historic sites include historic roads and highways, and a historic geoglyph.

Segment x-01

The Class I inventory (Brodbeck et al. 2017) results for Segment x-01 indicate that previously recorded sites consist of prehistoric artifact scatters.

Segment x-02

The Class I inventory (Brodbeck et al. 2017) results for Segment x-02 indicate that previously recorded sites consist of prehistoric artifact scatters and trails.

Segment x-03

The Class I inventory (Brodbeck et al. 2017) results for Segment x-03 indicate that no sites have been previously recorded along this segment. However, one previously unrecorded cultural resource is the Salome Emergency Airfield along the x-03 alignment. Identified on historic aerials, the airfield was built by American Airlines as an emergency land strip for its Phoenix-Los Angeles route sometime in the 1920s or early 1930s. The airfield is listed in the 1934 US Department of Commerce, Bureau of Air Commerce *Description of Airports and Landing Fields in the United States,* as an "American Airline Field, auxiliary." Such sites would be evaluated under historic contexts related to early air transportation.

Segment x-04

The Class I inventory (Brodbeck et al. 2017) results for Segment x-04 indicate that previously recorded prehistoric and historic sites are present. Previously recorded prehistoric sites consist of artifact scatters, trails, and rock alignments. Previously recorded historic sites consist of a road and a well.

12kV Distribution Line

Class I inventory conducted for the 12kV distribution line indicates that previously recorded historic sites are present. Previously recorded sites include road alignments and artifact scatters with features.

Cultural Resources Sensitive to Indirect Effects
Indirect auditory, atmospheric, and visual effects to historic properties could occur with Project construction and would need to be assessed by indirect effect analysis. Three cultural resources identified by the Class I research in the East Plains and Kofa Zone are beyond the 1-mile-wide corridor limits but were identified as resources that the Project could potentially affect indirectly because of their sensitivity to visual changes.

On Segment p-06, the BLM YFO archaeologist identified two sites that warrant an impact analysis:

- The Indian Well Site, AZ-050-1445 consists of two groups of petroglyphs near a spring or seep. Petroglyph sites associated with natural water sources are typically places of elevated cultural significance to Indian tribes.
- The other is an area of undocumented rock rings just west of site AZ-0502592.

The third cultural resource, the Eagletail Petroglyph Site, an NRHP-listed property, is located within the 5-mile indirect effects analysis area of Segment d-01 in the Eagletail Mountains. The site's NRHP eligibility and cultural significance to Indian tribes may include a visual component.

As components of traditional native infrastructure, prehistoric trail segments may be sensitive to indirect effects considerations. These occur along Proposed Action Segments p-04 and p-06; and along Alternative Segments d-01, i-03, x-02, and x-04.

Quartzsite Zone

The Quartzsite Zone includes Proposed Action Segments p-07 and p-08; and Alternative Segments i-05, qn-01, qn-02, qs-01, qs-02, x-05, x-06, and x-07. These are discussed in more detail by segment below.

A complete discussion of the results of a Class I inventory for each segment is presented in Brodbeck et al. (2017). Tables 3.6-7 and 3.6-8 summarize the previous survey coverage and site density within the 1-mile-wide and 200-foot-wide corridors, respectively. Tables 3.6-9 and 3.6-10 summarize the NRHP eligibility of those sites within the 1-mile-wide and 200-foot-wide corridors, respectively. The descriptions below these tables summarize site types within the 1-mile corridor of each segment.

Table 3.6-7 Previous Survey Coverage and Cultural Resources Identified Within the 1-Mile-Wide Corridor along Segments in the Quartzsite Zone

SEGMENT	AREA[1] (ACRES)	PREVIOUS SURVEY COVERAGE (ACRES)	PREVIOUS SURVEY COVERAGE (%)	TOTAL # OF SITES	SITE DENSITY (# PER 100 ACRES SURVEYED)
Proposed Action Segments					
p-07	1,356.6	297.6	21.9	22	7.4
p-08	429.5	137.9	32.1	8	5.8
Alternative Segments					
i-05	1,827.0	1,452.5	79.5	23	1.6
qn-01	381.1	630.7	165.5	16	2.5

SEGMENT	AREA[1] (ACRES)	PREVIOUS SURVEY COVERAGE (ACRES)	PREVIOUS SURVEY COVERAGE (%)	TOTAL # OF SITES	SITE DENSITY (# PER 100 ACRES SURVEYED)
qn-02	6,912.5	4,238.5	61.3	62	1.5
qs-01	1,954.4	2,141.4	109.6	28	1.3
qs-02	3,090.6	1,393.2	45.1	13	0.9
x-05	6,550.1	311.5	4.8	18	5.8
x-06[2]	7,587.7	1,631.7	21.5	6	0.4
x-07[2]	6,410.9	863.9	13.5	7	0.8

[1]Segment area calculated using line miles and one-mile corridor width.

[2] Data presented for segments x-06 and x-07 are derived from information provided by HDR independent of Brodbeck et al. 2017.

Table 3.6-8 Previous Survey Coverage and Cultural Resources Identified Within the 200-Foot-Wide Corridor along Segments in the Quartzsite Zone

SEGMENT	AREA[1] (ACRES)	PREVIOUS SURVEY COVERAGE (ACRES)	PREVIOUS SURVEY COVERAGE (%)	TOTAL # OF SITES	SITE DENSITY (# PER 100 ACRES SURVEYED)
Proposed Action Segments					
p-07	51.6	14.6	28.4	5	34.2
p-08	16.6	5.6	33.7	1	17.9
Alternative Segments					
i-05	69.6	25.2	36.3	1	4.0
qn-01	15.1	13.5	89.6	3	22.2
qn-02	263.3	149.0	56.6	7	4.7
qs-01	75.1	70.7	94.1	0	0.0
qs-02	118.0	45.3	38.4	5	11.0
x-05	248.9	2.4	1.0	1	41.1
x-06[2]	225.1	53.4	23.7	6	11.2
x-07[2]	188.2	5.7	3.1	7	122.8

[1]Segment area calculated using line miles and 200-foot corridor width.

[2] Data presented for segments x-06 and x-07 are derived from information provided by HDR independent of Brodbeck et al. 2017.

Table 3.6-9 NRHP Eligibility of Sites within the 1-Mile-Wide Corridor along Segments in the Quartzsite Zone

SEGMENT	DETERMINED ELIGIBLE	RECOMMENDED ELIGIBLE	DETERMINED INELIGIBLE	RECOMMENDED INELIGIBLE	NOT EVALUATED/ UNKNOWN	TOTAL # OF SITES
Proposed Action Segments						
p-07	3	2	15	0	2	22
p-08	0	0	5	0	3	8
Alternative Segments						
i-05	3	7	0	1	12	23
qn-01	1	1	4	1	9	16
qn-02	5	9	16	34	26	90
qs-01	2	1	3	5	17	28
qs-02	1	1	4	3	4	13
x-05	4	0	2	0	12	18
x-06[1]	3	4	7	3	23	40
x-07[1]	1	3	0	2	120	126

[1]Data presented for segments x-06 and x-07 are derived from information provided by HDR independent of Brodbeck et al. 2017.

Table 3.6-10 NRHP Eligibility of Sites within the 200-Foot-Wide Corridor along Segments in the Quartzsite Zone

SEGMENT	DETERMINED ELIGIBLE	RECOMMENDED ELIGIBLE	DETERMINED INELIGIBLE	RECOMMENDED INELIGIBLE	NOT EVALUATED/ UNKNOWN	TOTAL # OF SITES
Proposed Action Segments						
p-07	0	1	0	0	4	5
p-08	0	0	1	0	0	1
Alternative Segments						
i-05	0	0	0	0	1	1
qn-01	0	1	0	1	1	3
qn-02	1	2	1	2	1	7
qs-01	0	0	0	0	0	0
qs-02	0	1	1	3	0	5
x-05	0	1	0	0	0	1
x-06[1]	2	1	1	0	2	6
x-07[1]	0	0	1	0	6	7

[1]Data presented for segments x-06 and x-07 are derived from information provided by HDR independent of Brodbeck et al. 2017.

Proposed Action Segments: p-07 and p-08

Segment p-07

The Class I inventory (Brodbeck et al. 2017) results for Segment p-07 indicate that only previously recorded prehistoric sites are present. They consist of artifact scatters, trails, rock rings, rock alignments, and cleared circles.

Segment p-08

The Class I inventory (Brodbeck et al. 2017) results for Segment p-08 indicate that previously recorded prehistoric and historic sites are present. The previously recorded prehistoric sites consist of artifact scatters, rock rings, rock alignments, and rock features. The historic site is the Parker-Gila 161kV transmission line.

Alternative Segments: i-05, qn-01, qn-02, qs-01, qs-02, x-05, x-06, and x-07

Segment i-05

The Class I inventory (Brodbeck et al. 2017) results for Segment i-05 indicate that previously recorded prehistoric and historic sites are present. The previously recorded prehistoric sites include artifact scatters, rock rings, cleared circles, rock alignments, a depression, and rock piles. The previously recorded historic site is the alignment of US 60.

Segment qn-01

The Class I inventory (Brodbeck et al. 2017) results for Segment qn-01 indicate that previously recorded prehistoric and historic sites are present. The previously recorded prehistoric sites consist of rock alignments, rock rings, cairns, and cleared circles. The historic site is the alignment of US 60.

Segment qn-02

The Class I inventory (Brodbeck et al. 2017) results for Segment qn-02 indicate that previously recorded prehistoric and historic sites are present. Prehistoric sites consist of artifact scatters, trails, rock rings, alignments, cairns, cleared circles, and an intaglio. Historic sites consist of transmission lines, roads, and mines.

Segment qs-01

The Class I inventory (Brodbeck et al. 2017) results for Segment qs-01 indicate that previously recorded prehistoric and historic sites are present. Prehistoric sites consist of artifact scatters, trails, rock rings, rock alignments, cairns, and cleared circles. The historic site is the alignment of US 60.

Segment qs-02

The Class I inventory (Brodbeck et al. 2017) results for Segment qs-02 indicate that previously recorded prehistoric and historic sites are present. Prehistoric sites consist of artifact scatters, rock rings and alignments, cleared circles, and intaglios. Historic sites consist of the alignment of US 60, and the Parker-Gila 161kV transmission line.

Segment x-05

The Class I inventory (Brodbeck et al. 2017) results for Segment x-05 indicate that previously recorded prehistoric and historic sites are present. The previously recorded prehistoric sites consist of artifact scatters, trails, rock rings, rock features, and a cleared circle. One previously recorded historic site consists of a natural gas pipeline.

Segment x-06

The Class I inventory (Brodbeck et al. 2017) results for Segment x-06 indicate that previously recorded prehistoric and historic sites are present. Prehistoric sites consist of artifact scatters, trails, cleared circles, and rock rings. Historic sites consist of rock alignments, hearths, cairns, mine pits and waste, roads, and a utility line.

Segment x-07

The Class I inventory (Brodbeck et al. 2017) results for Segment x-07 indicate that previously recorded sites consist of prehistoric artifact scatters, trails, rock rings, rock alignments, rock features, rock piles, cleared circles, and an isolated biface.

Cultural Resources Sensitive to Indirect Effects

Indirect auditory, atmospheric, and visual effects to historic properties could occur with Project construction and would need to be assessed by indirect effect analysis. The Class I research identified two known cultural sites in the Quartzsite Zone that could potentially be indirectly affected by the Project because of their sensitivity to visual changes. These sites are:

- A recorded intaglio, site AZ-050-1887, is located within the 1-mile-wide corridor of alternative Segment qn-02. The site has not been evaluated for NRHP eligibility.
- Site AZ-050-1309 exhibits an intaglio, and prehistoric and historic petroglyphs. This site has been recommended eligible for inclusion in the NRHP and is within the 1-mile-wide corridor of alternative Segment qs-02.

As components of traditional native infrastructure, prehistoric trail segments may be sensitive to indirect effects considerations. Previously recorded cultural resources that contain prehistoric trail segments are located on Proposed Action Segments p-07 and p-09, as well as along Alternative Segments qn-02, qs-01, x-05, x-06 and x-07.

Copper Bottom Zone

The Copper Bottom Zone includes Proposed Action Segments p-09 through p-14; and Alternative Segments cb-01 through cb-06, i-06, i-07, and x-08. These are discussed in more detail by segment below.

A complete discussion of the results of a Class I inventory for each segment is presented in Brodbeck et al. (2017). Tables 3.6-11 and 3.6-12 summarize the previous survey coverage and site density within the 1-mile-wide and 200-foot-wide corridors, respectively. Tables 3.6-13 and 3.6-14 summarize the NRHP eligibility of those sites within the 1-mile-wide and 200-foot-wide corridors, respectively. The descriptions below these tables summarize site types within the 1-mile corridor of each segment.

Table 3.6-11 Previous Survey Coverage and Cultural Resources Identified Within the 1-Mile-Wide Corridor along Segments in the Copper Bottom Zone

SEGMENT	AREA[1] (ACRES)	PREVIOUS SURVEY COVERAGE (ACRES)	PREVIOUS SURVEY COVERAGE (%)	TOTAL # OF SITES	SITE DENSITY (# PER 100 ACRES SURVEYED)
Proposed Action Segments					
p-09	4,413.8	1,287.8	29.2	21	1.6
p-10	735.2	158.4	21.5	8	5.1
p-11	2,553.8	962.9	37.7	9	0.9
p-12	1,695.0	434.0	25.6	7	1.6
p-13	2,217.4	643.3	29.0	18	2.8
p-14	599.5	189.1	31.5	12	6.3
Alternative Segments					
cb-01	2,044.3	150.8	7.4	9	6.0
cb-02	2,189.0	177.3	12.6	6	3.4
cb-03	3,752.1	1,057.2	38.6	8	0.9
cb-04	1,195.3	148.6	12.4	8	5.4
cb-05	2,840.7	494.7	17.4	17	3.4
cb-06	1,225.3	124.3	10.1	3	2.4
i-06	4,555.6	2,242.5	49.2	10	0.4
i-07	4,135.2	2,331.7	56.4	40	1.7
x-08	811.4	569.8	70.2	7	1.2

[1]Segment area calculated using line miles and one-mile corridor width.

Table 3.6-12 Previous Survey Coverage and Cultural Resources Identified Within the 200-Foot-Wide Corridor along Segments in the Copper Bottom Zone

SEGMENT	AREA[1] (ACRES)	PREVIOUS SURVEY COVERAGE (ACRES)	PREVIOUS SURVEY COVERAGE (%)	TOTAL # OF SITES	SITE DENSITY (# PER 100 ACRES SURVEYED)
Proposed Action Segments					
p-09	168.0	130.0	77.4	2	1.5
p-10	28.3	17.8	62.8	1	5.6
p-11	100.1	61.5	61.4	2	3.3
p-12	64.2	6.3	9.8	0	0.0
p-13	84.0	81.9	97.5	6	7.3
p-14	23.1	17.3	74.9	4	23.1
Alternative Segments					
cb-01	77.9	3.8	4.8	0	0.0
cb-02	81.6	31.4	38.5	1	3.2
cb-03	106.0	16.6	15.6	2	12.0
cb-04	45.7	20.6	45.2	3	14.6
cb-05	107.9	9.3	8.7	0	0.0
cb-06	46.9	0.1	0.3	0	0.0
i-06	176.2	66.4	37.7	1	1.5
i-07	154.7	51.6	33.3	4	7.8
x-08	32.4	7.6	23.5	1	13.2

[1]Segment area calculated using line miles and 200-foot corridor width.

Table 3.6-13 NRHP Eligibility of Sites within the 1-Mile-Wide Corridor along Segments in the Copper Bottom Zone

SEGMENT	DETERMINED ELIGIBLE	RECOMMENDED ELIGIBLE	DETERMINED INELIGIBLE	RECOMMENDED INELIGIBLE	NOT EVALUATED/ UNKNOWN	TOTAL # OF SITES
Proposed Action Segments						
p-09	0	0	10	2	9	21
p-10	1	0	4	0	3	8
p-11	2	1	3	0	3	9
p-12	1	1	2	0	3	7
p-13	3	0	11	1	3	18
p-14	0	0	9	1	2	12

SEGMENT	DETERMINED ELIGIBLE	RECOMMENDED ELIGIBLE	DETERMINED INELIGIBLE	RECOMMENDED INELIGIBLE	NOT EVALUATED/ UNKNOWN	TOTAL # OF SITES
Alternative Segments						
cb-01	0	0	1	0	8	9
cb-02	1	0	1	0	5	7
cb-03	1	1	3	1	2	8
cb-04	0	0	0	0	8	8
cb-05	0	2	5	1	9	17
cb-06	0	0	1	0	2	3
i-06	2	1	1	2	4	10
i-07	3	2	0	5	30	40
x-08	3	1	0	1	2	7

Table 3.6-14 NRHP Eligibility of Sites within the 200-Foot-Wide Corridor along Segments in the Copper Bottom Zone

SEGMENT	DETERMINED ELIGIBLE	RECOMMENDED ELIGIBLE	DETERMINED INELIGIBLE	RECOMMENDED INELIGIBLE	NOT EVALUATED/ UNKNOWN	TOTAL # OF SITES
Proposed Action Segments						
p-09	0	0	0	0	2	2
p-10	0	0	0	0	1	1
p-11	0	0	0	0	2	2
p-12	0	0	0	0	0	0
p-13	2	0	4	0	0	6
p-14	0	0	4	0	0	4
Alternative Segments						
cb-01	0	0	0	0	0	0
cb-02	0	0	1	0	0	1
cb-03	1	0	0	1	0	2
cb-04	0	0	0	0	3	3
cb-05	0	0	0	0	0	0
cb-06	0	0	0	0	0	0
i-06	0	0	0	1	0	1
i-07	0	0	0	1	3	4
x-08	1	0	0	0	0	1

Proposed Action Segments: p-09 through p-14

<u>Segment p-09</u>

The Class I inventory (Brodbeck et al. 2017) results for Segment p-09 indicate that previously recorded prehistoric and historic sites are present. The prehistoric sites consist of prehistoric artifact scatters, trails, rock rings, a stone circle, roasting pits, and rock features. The historic site is the Parker-Gila 161kV transmission line.

<u>Segment p-10</u>

The Class I inventory (Brodbeck et al. 2017) results for Segment p-10 indicate that previously recorded sites consist of prehistoric artifact scatters, trails, and a stone circle.

<u>Segment p-11</u>

The Class I inventory (Brodbeck et al. 2017) results for Segment p-11 indicate that previously recorded prehistoric sites consist of artifact scatters, trails, and rock rings. Historic sites include a mining camp, a mine shaft, and a house foundation.

<u>Segment p-12</u>

The Class I inventory (Brodbeck et al. 2017) results for Segment p-12 indicate that previously recorded prehistoric and historic sites are present. The previously recorded prehistoric sites consist of artifact scatters, trails, and rock rings. Historic sites include mining camps, a mine shaft, and a house foundation.

<u>Segment p-13</u>

The Class I inventory (Brodbeck et al. 2017) results for Segment p-13 indicate that previously recorded prehistoric and historic sites are present. The previously recorded prehistoric sites consist of artifact scatters, stone circles, trails, rock rings, and an intaglio. Historic sites include rock cairns.

<u>Segment p-14</u>

The Class I inventory (Brodbeck et al. 2017) results for Segment p-14 indicate that previously recorded prehistoric sites consist of artifact scatters, trails, rock rings, and stone circles.

Alternative Segments: cb-01 through cb-06, i-06, i-07, and x-08

The information on cultural resources provided for Segments cb-03, i-06, i-07, and x-08 does not include any potential cultural resources or project data from the CRIT. Tribal data is sensitive information and can only be accessed through the tribe. This information was not available at the time of reporting; as a result, it is not included in the discussion herein.

<u>Segment cb-01</u>

The Class I inventory (Brodbeck et al. 2017) results for Segment cb-01 indicate that previously recorded prehistoric and historic sites are present. The prehistoric sites consist of artifact scatters, roasting pits, trails, stone circles, and rock rings. The historic site is a trash scatter.

Segment cb-02

The Class I inventory (Brodbeck et al. 2017) results for Segment cb-02 indicate that previously recorded prehistoric and historic sites are present. The previously recorded prehistoric sites consist of artifact scatters, a roasting pit, a rock circle, and a trail. Historic sites include house remains and a trash scatter.

Segment cb-03

The Class I inventory (Brodbeck et al. 2017) results for Segment cb-03, not including CRIT land, indicate that previously recorded prehistoric and historic sites are present. The prehistoric sites consist of artifact scatters, trails, and rock features. The historic sites are associated with mining.

Segment cb-04

The Class I inventory (Brodbeck et al. 2017) results for Segment cb-04 indicate that previously recorded prehistoric and historic sites are present. The prehistoric sites consist of artifact scatters. The historic site includes the remains of a house with an associated trash scatter.

Segment cb-05

The Class I inventory (Brodbeck et al. 2017) results for Segment cb-05 indicate that only previously recorded prehistoric sites are present, and consist of artifact scatters, rock rings, stone circles, trails, circular depressions, and a petroglyph.

Segment cb-06

The Class I inventory (Brodbeck et al. 2017) results for Segment cb-06 indicate that previously recorded prehistoric sites consist of artifact scatters and a trail.

Segment i-06

The Class I inventory (Brodbeck et al. 2017) results for Segment i-06, not including CRIT land, indicate that previously recorded prehistoric and historic sites are present. Prehistoric sites include artifact scatters, trails, rock rings, and a circular rock alignment. Previously recorded historic sites include a trash scatter and an El Paso Natural Gas line.

Segment i-07

The Class I inventory (Brodbeck et al. 2017) results for Segment i-07, not including CRIT land, indicate that previously recorded prehistoric and historic sites are present. Prehistoric sites consist of artifact scatters, trails, rock rings, cleared circles, and quarries. A prehistoric site containing an intaglio is present in the 200-foot-wide corridor. Historic sites consist of a mining shack, a road, a trash scatter, and an El Paso Natural Gas line.

Segment x-08

The Class I inventory (Brodbeck et al. 2017) results for Segment x-08, not including CRIT land, indicate that previously recorded prehistoric and historic sites are present. Prehistoric sites consist of artifact scatters, trails, rock features, and rock rings. Historic sites consist of a house foundation and mine shaft, and a historic trash scatter.

Cultural Resources Sensitive to Indirect Effects

Indirect auditory, atmospheric, and visual effects to historic properties could occur with Project construction and would need to be assessed by indirect effect analysis. The Project potentially could affect known intaglio/rock art/petroglyph sites in the Copper Bottom Zone because of their sensitivity to visual changes:

- Site AZ R:7:55 (ASM)/Limekiln Wash Intaglio, is located within the 200-foot-wide corridor of Proposed Action Segment p-13. The site consists of an intaglio and has been determined eligible for inclusion in the NRHP.
- Site AZ-050-0764 is located within the 200-foot-wide corridor of alternative Segment i-07. The site consists of an intaglio and has not been evaluated for NRHP significance.
- An anthropomorphic intaglio present at site AZ-050-0822 is located within the 200-foot-wide corridor of Segment p-13. This site has not been evaluated for NRHP significance.
- Petroglyph sites are also recorded along Alternative Segment i-06.

As components of traditional native infrastructure, prehistoric trail segments may be sensitive to indirect effects considerations. Previously recorded cultural resources that contain prehistoric trail segments are located on Proposed Action Segments p-10, p-11, p-12, p-13, and p-14, as well as along Alternative Segments cb-01, cb-02, cb-03, cb-05, cb-06, cb-10, i-08s, i-07, and x-08.

Colorado River and California Zone

The Colorado River and California Zone includes Proposed Action Segments p-[1]5e, p-15w, p-16, p-17, and p-18; and Alternative Segments ca-01, ca-02, ca-04 through ca-07, ca-09, cb-10, i-08s, x-09 through x-13, x-15, x-16, and x-19. These are discussed in more detail by segment below.

A complete discussion of the results of a Class I inventory for each segment is presented in Brodbeck et al. (2017) and Leard and Brodbeck (2017). Tables 3.6-15 and 3.6-16 summarize the previous survey coverage and site density within the 1-mile-wide and 200-foot-wide corridors, respectively. Tables 3.6-17 and 3.6-18 summarize the NRHP eligibility of those sites within the 1-mile-wide and 200-foot-wide corridors, respectively. The descriptions below these tables summarize site types within the 1-mile corridor of each segment.

Table 3.6-15 Previous Survey Coverage and Cultural Resources Identified Within the 1-Mile-Wide Corridor along Segments in the Colorado River and California Zone[1,2]

SEGMENT	AREA[3] (ACRES)	PREVIOUS SURVEY COVERAGE (ACRES)	PREVIOUS SURVEY COVERAGE (%)	TOTAL # OF SITES	SITE DENSITY (# PER 100 ACRES SURVEYED)
Proposed Action Segments					
p-15e	2,306.3	479.5	20.8	5	1.0
p-15w	4,727.5	353.0	7.5	11	3.1
p-16	3,532.3	447.8	12.7	43	9.6
p-17	2,429.5	1,547.4	63.7	106[4]	6.9

SEGMENT	AREA[3] (ACRES)	PREVIOUS SURVEY COVERAGE (ACRES)	PREVIOUS SURVEY COVERAGE (%)	TOTAL # OF SITES	SITE DENSITY (# PER 100 ACRES SURVEYED)
p-18	1,965.9	1,135.0	57.7	95	8.4
Alternative Segments					
ca-01	4,741.0	98.5	2.1	13	13.2
ca-02[5]	2,755.3	401.3	14.6	25	6.2
ca-04	1,015.3	125.0	12.3	1	0.8
ca-05	4,714.7	243.4	5.2	11	4.5
ca-06	2,194.0	638.3	29.1	9	1.4
ca-07	1,629.9	880.2	54.0	22	2.5
ca-09	2,378.2	1,548.8	65.1	66	4.3
cb-10	1,696.2	315.1	18.6	8	2.5
i-08s	1,311.1	361.2	27.5	1	0.3
x-09	837.8	73.0	8.7	1	1.4
x-10	1,389.2	74.6	5.4	1	1.3
x-11	1,815.5	86.4	4.8	2	2.3
x-12	1,414.4	66.7	4.7	8	12.0
x-13	1,864.2	84.9	4.6	6	7.1
x-15	1,579.3	768.5	48.7	22	2.9
x-16	1,934.7	1,066.4	55.1	63	5.9
x-19	1,067.0	830.3	77.8	62	7.5

[1]The sites summarized in this table are located in California and Arizona.

[2]Data presented in this table are derived from information provided by HDR independent of Brodbeck et al. 2017.

[31]Segment area calculated using line miles and one-mile corridor width.

[4]Data for segments p-16, p-17, and p-18 are based on recent Class III survey conducted by Applied EarthWorks (Gardner et al. 2018).

[5]Two large and complex sites, CA-RIV-1819/H and CA-RIV-1821/H, contain multiple features and loci surrounded and connected by a more diffuse scatter of prehistoric and historical artifacts. Applied EarthWorks (Gardner et al. 2018) found a largely continuous scatter of artifacts connecting these two sites to others that had been recorded originally as separate cultural resources. As a result, five of the smaller previously recorded sites were merged with CA-RIV-1819/H and 18 were merged with CA-RIV-1821/H. These smaller resources are now considered parts of the larger site.

Table 3.6-16 Previous Survey Coverage and Cultural Resources Identified Within the 200-Foot-Wide Corridor along Segments in the Colorado River and California Zone[1]

SEGMENT	AREA[2] (ACRES)	PREVIOUS SURVEY COVERAGE (ACRES)	PREVIOUS SURVEY COVERAGE (%)	TOTAL # OF SITES	SITE DENSITY (# PER 100 ACRES SURVEYED)
Proposed Action Segments					
p-15e	68.5	21.3	31.1	3	14.1
p-15w	161.5	52.4	32.4	8	15.3
p-16	116.1	16.9	14.6	8	47.3
p-17	71.2	71.2	100.0	25[3]	35.1
p-18	62.9	62.9	100.0	14	22.3
Alternative Segments					
ca-01	162.2	3.3	2.0	9	272.7
ca-02[4]	82.8	8.4	10.1	3	35.7
ca-04	9.4	2.0	21.3	0	0.0
ca-05	161.9	5.5	3.4	6	109.1
ca-06	64.1	21.2	33.1	1	4.7
ca-07	74.7	52.6	70.5	2	3.8
ca-09	64.6	64.6	100.0	2	3.1
cb-10	46.8	6.6	14.1	0	0.0
i-08s	32.5	9.4	28.9	0	0.0
x-09	19.8	6.0	30.3	0	0.0
x-10	31.1	18.9	60.8	0	0.0
x-11	51.7	0.8	1.5	1	125.0
x-12	30.7	1.5	4.9	2	133.3
x-13	48.7	1.6	3.3	1	62.5
x-15	35.6	22.4	62.9	0	0.0
x-16	57.3	7.6	13.3	2	26.2
x-19	24.2	24.2	100.0	4	16.5

[1]Data presented in this table are derived from information provided by HDR independent of Brodbeck et al. 2017.
[2]Segment area calculated using line miles and 200-foot corridor width.
[3]Data for segments p-16, p-17, and p-18 are based on recent Class III survey conducted by Applied EarthWorks (Gardner et al. 2018).
[4]Two large and complex sites, CA-RIV-1819/H and CA-RIV-1821/H, contain multiple features and loci surrounded and connected by a more diffuse scatter of prehistoric and historical artifacts. Applied EarthWorks (Gardner et al. 2018) found a largely continuous scatter of artifacts connecting these two sites to others that had been recorded originally as separate cultural resources. As a result, five of the smaller previously recorded sites were merged with CA-RIV-1819/H and 18 were merged with CA-RIV-1821/H. These smaller resources are now considered parts of the larger site.

Table 3.6-17 NRHP Eligibility of Sites within the 1-Mile-Wide Corridor along Segments in the Colorado River and California Zone[1]

SEGMENT	DETERMINED ELIGIBLE	RECOMMENDED ELIGIBLE	DETERMINED INELIGIBLE	RECOMMENDED INELIGIBLE	NOT EVALUATED/ UNKNOWN	TOTAL # OF SITES
Proposed Action Segments						
p-15e	0	1	0	0	4	5
p-15w	0	0	0	0	11	11
p-16	0	0	20	0	23	43
p-17	3	4	63	0	36	106[2]
p-18	4	0	38	0	53	95
Alternative Segments						
ca-01	0	0	0	0	13	13
ca-02[3]	0	1	0	18	6	25
ca-04	0	0	0	0	1	1
ca-05	0	0	0	0	11	11
ca-06	0	0	2	0	7	9
ca-07	0	0	15	0	7	22
ca-09	0	0	40	0	26	66
cb-10	0	0	0	0	8	8
i-08s	0	0	0	0	1	1
x-09	0	0	0	0	1	1
x-10	0	0	0	0	1	1
x-11	0	0	0	0	2	2
x-12	0	0	0	0	8	8
x-13	0	0	0	0	6	6
x-15	0	1	19	0	2	22
x-16	0	1	45	0	17	63
x-19	2	0	24	0	36	62

[1]Data presented in this table are derived from information provided by HDR independent of Brodbeck et al. 2017.

[2]Data for segments p-16, p-17, and p-18 are based on recent Class III survey conducted by Applied EarthWorks (Gardner et al. 2018).

[3]Two large and complex sites, CA-RIV-1819/H and CA-RIV-1821/H, contain multiple features and loci surrounded and connected by a more diffuse scatter of prehistoric and historical artifacts. Applied EarthWorks (Gardner et al. 2018) found a largely continuous scatter of artifacts connecting these two sites to others that had been recorded originally as separate cultural resources. As a result, five of the smaller previously recorded sites were merged with CA-RIV-1819/H and 18 were merged with CA-RIV-1821/H. These smaller resources are now considered parts of the larger site.

[4]ca-02 data is not differentiated between "determined" or "recommended" ineligibility. Since agency determination was not available, all sites are presented as "recommended ineligible."

Table 3.6-18 NRHP Eligibility of Sites within the 200-Foot-Wide Corridor along Segments in the Colorado River and California Zone[1]

SEGMENT	DETERMINED ELIGIBLE	RECOMMENDED ELIGIBLE	DETERMINED INELIGIBLE	RECOMMENDED INELIGIBLE	NOT EVALUATED/ UNKNOWN	TOTAL # OF SITES
Proposed Action Segments						
p-15e	0	0	0	0	3	3
p-15w	0	0	0	0	8	8
p-16	0	0	3	0	5	8
p-17	2	0	16	0	7	25[2]
p-18	1	0	6	0	7	14
Alternative Segments						
ca-01	0	0	0	0	9	9
ca-02[3]	0	0	0	0	3	3
ca-04	0	0	0	0	0	0
ca-05	0	0	0	0	1	1
ca-06	0	0	0	0	6	6
ca-07	0	0	0	2	0	2
ca-09	0	0	0	2	0	2
cb-10	0	0	0	0	0	0
i-08s	0	0	0	0	0	0
x-09	0	0	0	0	0	0
x-10	0	0	0	0	0	0
x-11	0	0	0	0	1	1
x-12	0	0	0	0	2	2
x-13	0	0	0	0	1	1
x-15	0	0	0	0	0	0
x-16	0	0	0	1	1	2
x-19	0	0	1	0	3	4

[1]Data presented in this table are derived from information provided by HDR independent of Brodbeck et al. 2017.

[2]Data for segments p-16, p-17, and p-18 are based on recent Class III survey conducted by Applied EarthWorks (Gardner et al. 2018).

[3]Two large and complex sites, CA-RIV-1819/H and CA-RIV-1821/H, contain multiple features and loci surrounded and connected by a more diffuse scatter of prehistoric and historical artifacts. Applied EarthWorks (Gardner et al. 2018) found a largely continuous scatter of artifacts connecting these two sites to others that had been recorded originally as separate cultural resources. As a result, five of the smaller previously recorded sites were merged with CA-RIV-1819/H and 18 were merged with CA-RIV-1821/H. These smaller resources are now considered parts of the larger site.

Proposed Action Segments: p-15e, p-15w, p-16, p-17, and p-18

Segment p-15e

The Class I inventory (Brodbeck et al. 2017) and Class I addendum (Brodbeck 2017) results for Segment p-15e indicate that previously recorded sites consist of prehistoric artifact scatters, trails, and rock rings.

Segment p-15w

The Class I inventory (Brodbeck et al. 2017) and Class I addendum (Brodbeck 2017) results for Segment p-15w indicate that previously recorded prehistoric and historic sites are present. The prehistoric site consists of a bedrock milling station. Previously recorded historic sites consist of agricultural canals and drains, roads, and an Atchison, Topeka, and Santa Fe Railroad (AT&SF) railroad grade.

Segment p-16

The Class I inventory (Brodbeck et al. 2017) and Class I addendum (Brodbeck 2017) results for Segment p-16 indicate that previously recorded prehistoric sites consist of artifact scatters, features with artifact concentrations, and trails. Previously recorded historic sites consist of agricultural canals, a survey marker, roads, tank tracks, transmission lines, and trash scatters. One previously recorded site is of unknown chronology. Segment p-16 is further discussed in the Project's sensitivity analysis (Appendix 3B).

Segment p-17

The Class I inventory (Brodbeck et al. 2017) and Class I addendum (Brodbeck 2017) results for Segment p-17 indicate that prehistoric and historic sites are present. Prehistoric sites include many lithic and ceramic scatters, but also sites with lithics, ceramics, faunal bone, hearths, and calcined bone consistent with human cremains. Large artifact scatters with many loci, many sites with hearths or other thermal cobble features, and trail sites have been previously recorded. Previously recorded historic sites are dominated by trash scatters but also include roads, communication wire, tank tracks, trails, and transmission lines. Multicomponent sites containing prehistoric and historic artifacts/features are also present Segment p-17 is further discussed in the Project's sensitivity analysis (Appendix 3B).

One site of particular concern along Segment p-17 is CA-RIV-1821 (now identified as CA-RIV-1821/H based on recent research conducted by Applied Earthworks), which includes calcined bone consistent with human cremains. The site was originally recorded in 1980 by the BLM during the Southern California Edison Devers–Palo Verde cultural resources survey (Day et al. 1980) and was subsequently revisited in 2004 by Mooney and Associates, who updated the site boundary and documented calcined bone in association with a small thermal cobble feature (Way and Eckhardt 2004). In 2005, Mooney Jones & Stokes updated the site's condition (Wilson et al. 2005). In 2008, the site was once again updated by ICF Jones & Stokes during a survey for the proposed Blythe Energy Transmission Project (Eckhardt et al. 2008).

In 2014, the site was revisited by Statistical Research, Inc. (SRI), during a survey for the Desert Quartzsite solar project (Lerch et al. 2016). SRI located the previously recorded thermal cobble feature but did not observe calcined bone in association. However, SRI also found a newly identified scatter of calcined bone outside the previously defined site boundary. The scatter included approximately 12 pieces of bone within a 13- by 15-m area. The site boundary was updated accordingly. SRI noted that the site is in an active drainage subject to erosion and depositional processes, and that it appears the artifacts and the potential human cremains are actively being exposed and covered over by sediments over time.

Applied EarthWorks revisited the site in 2017 during survey for the Ten West Link project (Gardner et al. 2018). The boundaries of the site were expanded significantly to incorporate 18 smaller previously recorded cultural resources, including a continuous scatter of prehistoric and historic artifacts and numerous associated prehistoric and historic features. The calcined bone reported by previous researchers (Lerch et al. 2016; Way and Eckhardt 2004) was not identified by the Gardner et al. (2018) fieldwork.

Another cultural resource of special note near Segment p-17 is the Mule Tank Discontiguous Rock Art District, containing archaeological sites CA-RIV-504 and CA-RIV-773. The district is listed on the NRHP and is of known significance to Indian tribes. It is located outside the 1-mile-wide corridor but is close enough for consideration of potential indirect and cumulative effects.

Segment p-18

The Class I inventory (Brodbeck et al. 2017) and Class I addendum (Brodbeck 2017) results for Segment p-18 indicate that both prehistoric and historic sites are present. Prehistoric sites consist of ceramic scatters/pot drops, lithic scatters, artifact scatters with hearths or thermal cobble features, and an extensive artifact scatter with several loci. Previously recorded historic sites consist of trash scatters, a military campsite, military fox holes, a road, and GLO survey monuments. Multicomponent sites containing prehistoric and historic artifacts/features are also present Segment p-18 is further discussed in the Project's sensitivity analysis (Appendix 3B).

Alternative Segments: ca-01, ca-02, ca-04 through ca-09, x-09 through x-13, x-15, x-16, and x-19

Segment ca-01

The Class I inventory (Brodbeck et al. 2017) and Class I addendum (Brodbeck 2017) results for Segment ca-01 indicate that only previously recorded historic sites are present. They consist of residences, an industrial yard, agricultural canals, a railroad spur, and roads.

Segment ca-02

The Class I inventory (Brodbeck et al. 2017) results indicate that a previously recorded prehistoric trail occurs within the segment. The balance of the previously recorded sites is historic, and consists of agricultural canals, roads, historic trails, trash scatters, GLO survey datums, and transmission lines. Segment ca-02 is further discussed in the Project's sensitivity analysis (Appendix 3B).

Segment ca-04

The Class I inventory (Brodbeck et al. 2017) and Class I addendum (Brodbeck 2017) results for Segment ca-04 indicate that the previously recorded sites are all historic agricultural canals.

Segment ca-05

The Class I inventory (Brodbeck et al. 2017) and Class I addendum (Brodbeck 2017) results for Segment ca-05 indicate that previously recorded sites are all historic; the site types include agricultural canals, roads, and a utility line.

Segment ca-06

The Class I inventory (Brodbeck et al. 2017) and Class I addendum (Brodbeck 2017) results for Segment ca-06 indicate that previously recorded prehistoric and historic sites are present. The prehistoric site is characterized as an artifact scatter with lithics and ceramics. Historic sites consist of an agricultural canal and an associated road, transmission line, and roads.

Segment ca-07

The Class I inventory (Brodbeck et al. 2017) and Class I addendum (Brodbeck 2017) results for Segment ca-07 indicate that previously recorded prehistoric and historic sites are present. Prehistoric sites include a hearth and a small ceramic and shell scatter. The historic sites include trash scatters, roads, a survey marker, a transmission line, and a well. Segment ca-07 is further discussed in the Project's sensitivity analysis (Appendix 3B).

Segment ca-09

The Class I inventory (Brodbeck et al. 2017) and Class I addendum (Brodbeck 2017) results for Segment ca-09 indicate that previously recorded prehistoric and historic sites are present. The prehistoric sites include artifact scatters and one site of unknown function. Historic site types are dominated by trash scatters, but also include military activity sites, roads, trails, and GLO/USGS survey markers and monuments. Multicomponent sites containing prehistoric and historic artifacts/features are also present. Segment ca-09 is further discussed in the Project's sensitivity analysis (Appendix 3B).

Segment cb-10

The Class I inventory (Brodbeck et al. 2017) results for Segment cb-10 indicate that previously recorded sites include prehistoric artifact scatters, rock rings, and trails.

Segment i-08s

The Class I inventory (Brodbeck et al. 2017) results for Segment i-08s indicate that previously recorded prehistoric and historic sites are present. The prehistoric sites include artifact scatters, trails, a cleared circle, quarries, rock rings, and petroglyphs. Previously recorded historic sites include a trash scatter, and an El Paso Natural Gas line.

Segment x-09

The Class I inventory (Brodbeck et al. 2017) and Class I addendum (Brodbeck 2017) results for Segment x-09 indicate that previously recorded sites are all historic agricultural canals.

Segment x-10

The Class I inventory (Brodbeck et al. 2017) and Class I addendum (Brodbeck 2017) results for Segment x-10 indicate that one previously recorded historic site consists of a canal with a concrete overpass

Segment x-11

The Class I inventory (Brodbeck et al. 2017) and Class I addendum (Brodbeck 2017) results for Segment x-11 indicate that previously recorded prehistoric and historic sites are present. Prehistoric sites consist of artifact scatters. The historic sites consist of canals.

Segment x-12

The Class I inventory (Brodbeck et al. 2017) and Class I addendum (Brodbeck 2017) results for Segment x-12 indicate that previously recorded sites are all historic agricultural canals and roads.

Segment x-13

The Class I inventory (Brodbeck et al. 2017) and Class I addendum (Brodbeck 2017) results for Segment x-13 indicate that all previously recorded sites are historic and consist of agricultural canals, roads, an artifact scatter, and a transmission line.

Segment x-15

The Class I inventory (Brodbeck et al. 2017) and Class I addendum (Brodbeck 2017) results for Segment x-15 indicate that previously recorded prehistoric and historic sites are present. The prehistoric sites consist of a lithic scatter, a pot drop, and a trail. The historic sites are artifact concentrations, military activity sites, roads, a survey marker, and transmission lines. Segment x-15 is further discussed in the Project's sensitivity analysis (Appendix 3B).

Segment x-16

The Class I inventory (Brodbeck et al. 2017) and Class I addendum (Brodbeck 2017) results for Segment x-16 indicate that previously recorded prehistoric and historic sites are present. Prehistoric sites include lithic scatters, ceramic scatters, several artifact scatters with associated features, and trails. The historic sites are characterized mostly as artifact scatters but also include roads, tank tracks, transmission lines, and GLO survey markers. One previously recorded site is of unknown chronology and site type. Segment x-16 is further discussed in the Project's sensitivity analysis (Appendix 3B).

Segment x-19

The Class I inventory (Brodbeck et al. 2017) and Class I addendum (Brodbeck 2017) results for Segment x-19 indicate that previously recorded prehistoric and historic sites are present. Prehistoric site types include lithic and ceramic scatters, several also containing associated hearths. Historic site types include primarily trash scatters but also a USGS survey monument, military campsites, and GLO survey markers. Multicomponent sites containing prehistoric and historic artifacts/features are also present. Segment x-19 is further discussed in the Project's sensitivity analysis (Appendix 3B).

Cultural Resources Sensitive to Indirect Effects
The Project potentially could affect known intaglio and petroglyph sites in the Colorado River and California Zone because of their sensitivity to visual changes.

Site AZ R:10:1 (ASM)/Ripley Intaglio Site, is listed in the NRHP (#75000368; 11/20/1975). It is situated on the terraces overlooking the Colorado River on the Arizona side of the state line (Ezzo 1993; Holmlund 1993). In this zone, the site is located within the 5-mile indirect effects analysis area of the Proposed Action Segment p-15e and includes a set of large anthropomorphic, geometric, and abstract figures etched into the desert surface.

Mule Tank Discontiguous Rock Art District, containing archaeological sites CA-RIV-504 and CA-RIV-773, is located in the northern Mule Mountains to the southwest of the Proposed Action Segments p-17 and p-18. It consists of an archaeological district that is listed in the NRHP and is culturally significant for the Indian tribes along the Colorado River. The district includes a natural water catchment and was—and is—an important junction of indigenous travel routes and a focal point of human activity. Numerous trails extend away from this district and are related to the intaglios and petroglyphs. Petroglyph sites are also recorded within the 1-mile-wide corridor of alternative Segment i-08s.

Site CA-RIV-000661 is a multicomponent site that consists of a cobble rock alignment and possible intaglio. It is located within the 1-mile corridor of Alternative Segments ca-07 and ca-09. The status of the site's NRHP eligibility is unknown.

Site CA-RIV-000662 consists of a cobble rock alignment and possible intaglio. It is located within the 1-mile corridor of Alternative Segment ca-09 and has not been evaluated for NRHP eligibility.

As components of traditional native infrastructure, prehistoric trail segments may be sensitive to indirect effects considerations. Previously recorded cultural resources that contain prehistoric trail segments are located on Proposed Action Segments p-15e and p-17, as well as Alternative Segments x-15 and x-16.

3.7 CONCERNS OF INDIAN TRIBES

3.7.1 Applicable Laws, Regulations, Policies, and Plans

The following is an overview of those regulatory requirements specific to the protection of tribal sacred sites, traditional cultural places, and other areas of cultural or religious significance to Indian tribes; as well as protocols regarding consultation with Indian tribes.

3.7.1.1 Federal

NHPA Amendment for the Protection of Native American Cultural and Religious Sites

As discussed in Section 3.6.1.1, Section 106 of the NHPA requires that federal agencies take into account the effects of undertakings on historic properties. An amendment to the NHPA was issued in 1992 to officially recognize that traditional Native American cultural and religious sites–TCPs–are historic properties that may be eligible for the NRHP, and therefore must be considered to ensure compliance with Section 106 of the NHPA.

To ensure that TCPs are identified and considered during the planning process, federal agencies must identify federally recognized Indian tribes with affiliation to project areas and consult with them. The purpose of this consultation is to identify areas of tribal concern, which are often not tangible on the landscape, assess potential effects to these resources, and to develop potential adverse effect resolution measures with tribal input.

AIRFA

The AIRFA of 1978 (Public Law 95-341) was passed by Congress to protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise their traditional religions, including, but not limited to, access to sites, use and possession of sacred objects, and the freedom to worship through ceremonies and traditional rites. Thus, any site or place (prehistoric or historic) with religious, ceremonial, or sacred aspects or components needs to be evaluated within the context of this law. The law requires that Federal agencies review policies for compliance, but it contains no enforcement provisions or sanctions for protocols or procedures that do not comply with the overall policy.

Native American Graves Protection and Repatriation Act

The Native American Graves Protection and Repatriation Act of 1990 and the regulations that allow for its implementation (43 CFR 10) address the rights of lineal descendants, Indian tribes, and Native Hawaiian organizations to tribal human remains, funerary objects, sacred objects, and objects of cultural patrimony (cultural items). The statute requires Federal agencies and museums that receive Federal funds to provide information about the cultural items of Indian tribes to parties with standing and, upon presentation of a valid claim, ensure the item(s) undergo disposition or repatriation.

Archaeological Resource Protection Act of 1979

The purpose of the ARPA is to secure the protection of archaeological resources and sites on public lands and Indian lands, and to foster increased cooperation and exchange of information between governmental authorities, the professional archaeological community, and private individuals having collections of archaeological resources. The law applies to any agency that receives information that a direct or Federally assisted activity could cause irreparable harm to prehistoric, historic, or archaeological data and provides criminal penalties for prohibited activities. ARPA requires notification to an Indian tribe before approving a Cultural Resource Use Permit for the excavation of archaeological resources if it is determined that a place having cultural or religious importance to the tribe may be harmed or destroyed by the permitted work.

Other Relevant Federal Laws and Policies

- EO 13007, "Indian Sacred Sites," was designed to protect, when practical, access to tribal sacred sites on Federal land;
- EO 13175, "Consultation and Coordination with Indian Tribal Governments," encourages the strengthening of government-to-government relations between the US government and Indian tribes;

BLM Tribal Consultation Manual, "MS-1780 – Tribal Relations" and Handbook "H-1780-1 – Improving and Sustaining BLM-Tribal Relations" (BLM 2016f and 2016g).

3.7.2 Analysis Area

The analysis area for concerns of Indian tribes is the same as that described in Section 3.6.2.

3.7.3 Existing Conditions

The Project is within ancestral lands of Indian tribes, and tribal communities have maintained a spiritual stewardship and cultural connection to the landscape. The numerous natural and cultural resources in and around the Project Area contain cultural and spiritual significance for Indian tribes, and continues to play fundamental roles in cultural traditions, group identities, and ongoing religious and ceremonial traditions. Consultation and coordination with several of the tribes suggests that the Project Area is both a traditional cultural landscape and there may be TCPs present.

Information provided by tribes about areas of specific tribal concern has been and will continue to be identified during Section 106 and Government-to-Government consultation processes and considered during the evaluation and assessment of effects under Section 106 and NEPA. An ethnographic overview has been prepared to present baseline information on tribal cultural connections within the Project Area. As the Project develops, new cultural sites and places become known, and input from Indian tribes is gathered and integrated into Project planning; the resulting information has been and will continue to be incorporated into resource assessments.

Given the physical length of the Project, several Indian tribes with affiliation to the greater Project Area have been identified during the initial consultation process. Information regarding these Indian tribal communities is presented in Section 3.6.3.1 and based on a literature search of existing ethnographic sources compiled by Leard and Brodbeck (2017).

3.7.3.1 Potential Resource Types of Cultural Significance

In addition to more traditionally defined sites that may be evaluated under the NRHP criteria for eligibility (Section 3.6), other types of cultural resources that may be of cultural and religious significance to Indian tribes within the Project Area should be addressed and evaluated. Tribal cultural resources can include a site, feature, place, cultural landscape, sacred place, or an object of cultural value. The following cultural resources types are borrowed from AECOM's (2012) ethnographic assessment for the McCoy Solar Energy Project. Though cultural resources of these types may not qualify as eligible under the NRHP, or sometimes even as archaeological sites, certain types of cultural resources may still be considered significant. Such cultural resource types significant to Indian tribes include, but are not limited to:

A. *Traditional Origin and Mythological Places.* Such places are locations associated with beliefs concerning tribal origins and mythology or the nature of the world. Physical archaeological evidence may not exist at such locations and they may consist only of geographic features.
B. *Ceremonial Locations.* Ceremonial locations include places where religious practitioners go, either in the past or present, to perform ceremonial activities based on the traditions of the culture. Examples could include rock art sites, dance sites, hot springs, and places where objects have been ritually placed. These locations may or may not show evidence of

archaeological use; and, even if archaeological remains are present, the function of the site may not be readily apparent.

C. *Historical Tribal Locations.* Historical tribal locations are places where an important historical event has occurred relating to particular Indian tribes. This category might include battle sites, sites associated with historic Tribal members, or locations where treaties were negotiated.

D. *Ethnohistoric Habitation Sites.* These are habitation sites known to have been used by a particular tribe or culture. The location of such sites may be known through either written or oral histories. Most of these sites will likely contain archaeological evidence.

E. *Trails.* Trails, particularly those associated with migration or traded routes, are considered culturally significant by many Indian tribes. Trails represent links between various tribes and regions and may also lead to places of spiritual significance. The act of following a trail can be a spiritual journey in itself.

F. *Burial Sites.* Burial sites are culturally significant to Indian tribes. The exact locations of burial sites are not always known or divulged.

G. *Resource Collection Areas.* Resource collection areas include a wide variety of places from which plants, animals, minerals, and water are gathered for medicinal or other subsistence purposes. It is sometimes difficult to establish concise boundaries for these locations. Examples of resource collection areas include groves of ethnobotanically important plant materials, quarries, lakes, and springs.

Given the nature of cultural resources of these types, it can be concluded that not all of these sites are tangible or observable locations and, as such, may or may not be readily identifiable during an archaeological survey or meet NRHP eligibility. Nevertheless, such site types may be culturally significant to Indian tribes, regardless of NRHP eligibility, and therefore should be taken into consideration. Certain locations may only be known through oral traditions or recorded through ethnographic work.

3.7.3.2 Tribal Consultation

As the lead Federal agency responsible for ensuring compliance with the provisions of Section 106 of the NHPA, and other regulatory requirements specific to historic properties and tribal concerns, the BLM has initiated consultation with affiliated Indian tribes. Affiliated Indian tribes were identified by BLM Field Offices (Yuma, Palm Springs-South Coast, Lake Havasu, Hassayampa, and Lower Sonoran), as well as through communication with the Native American Heritage Commission in California.

The BLM's consultation protocols include formal government-to-government and Section 106 consultation through letters and outreach, and face-to-face meetings and conference calls. In addition, the BLM has requested tribal input through the NEPA scoping process and workshops.

Efforts to initiate government-to-government consultation with Indian tribes with jurisdiction or interest in the Project have been undertaken. A separate summary of government-to-government consultation will be prepared at a later date and included in the Project's administrative record.

The following tribes have been contacted regarding the Project:

Agua Caliente Band of Cahuilla Indians
Ak-Chin Indian Community
Augustine Band of Cahuilla Indians
Cabazon Band of Mission Indians
Chemehuevi Tribe
Cocopah Indian Tribe of Arizona
Colorado River Indian Tribes (CRIT)
Fort McDowell Yavapai Nation
Fort Mojave Tribe of Arizona
Fort Yuma Quechan Tribe
Gila River Indian Community Hopi Tribe of Arizona
Moapa Band of Paiute Indians
Morongo Band of Mission Indians
Salt River Pima-Maricopa Indian Community
San Manuel Band of Mission Indians
Soboba Band of Luiseno Indians
Tohono O'odham Nation
Torres Martinez Desert Cahuilla Indians
Twenty-Nine Palms Band of Mission Indians
Yavapai-Apache Nation
Yavapai-Prescott Indian Tribes

Pueblo of Zuni

The BLM initiated consultation through an initial Section 106 information letter providing an overview of the Project with an invitation to participate in the government-to-government and Section 106 consultation process.

Table 3.7-1 summarizes tribal consultation and coordination to date. This will be ongoing during the NEPA process.

Table 3.7-1 Tribal Consultation and Coordination to Date

DATE	TRIBE	DESCRIPTION
2/16/16	Agua Caliente Band of Cahuilla Indians Ak-Chin Indian Community Augustine Band of Cahuilla Indians Cabazon Band of Mission Indians Chemehuevi Tribe Cocopah Indian Tribe Colorado River Indian Tribes Fort McDowell Yavapai Nation Fort Mojave Tribe Gila River Indian Community Hopi Tribe Morongo Band of Mission Indians Fort Yuma Quechan Tribe Salt River Pima-Maricopa Indian Community San Manuel Band of Mission Indians Soboba Band of Luiseno Indians Tohono O'odham Nation Torres Martinez Desert Cahuilla Indians Twenty-Nine Palms Band of Mission Indians Yavapai-Apache Nation Yavapai-Prescott Indian Tribe	Initial letters to tribes inviting government to government consultation on the Project, including Project description.
2/16/16	Agua Caliente Band of Cahuilla Indians	Declined to participate.
2/16/16	Ak-Chin Indian Community	Deferred to Gila River Indian Community THPO. Requested continued consultation.
2/16/16	Augustine Band of Cahuilla Indians	Declined to participate. Requested continued consultation if there are discoveries.
2/16/16	Cabazon Band of Mission Indians	Declined to participate.
2/16/16	Chemehuevi Tribe	Requested continued consultation if there are discoveries.
2/16/16	Cocopah Indian Tribe	Requested consulting party status.
2/16/16	Colorado River Indian Tribes	Requested consulting party status.
2/16/16	Fort McDowell Yavapai Nation	No response.
2/16/16	Fort Mojave Indian Reservation	Requested consulting party status.
2/16/16	Gila River Indian Community	Requested consulting party status.
2/16/16	Hopi Tribe of Arizona	Requested continued consultation.
2/16/16	Morongo Band of Mission Indians	Requested continued consultation and consulting party status.
2/16/16	Fort Yuma Quechan Tribe	Requested consulting party status.
2/16/16	Salt River Pima-Maricopa Indian Community	Requested consulting party status.
2/16/16	San Manuel Band of Mission Indians	Declined to participate.
2/16/16	Soboba Band of Luiseño Indians	Requested continued consultation.
2/16/16	Tohono O'odham Nation	Requested consulting party status and continued consultation.
2/16/16	Torres-Martinez Desert Cahuilla Indians	Requested consulting party status.
2/16/16	Twenty-Nine Palms Band of Mission Indians	Requested continued consultation and consulting party status.

DATE	TRIBE	DESCRIPTION
2/16/16	Yavapai-Apache Nation	Requested consulting party status.
2/16/16	Yavapai-Prescott Indian Tribe	No response.
3/30/16	See above recipients (2/16/2016 entry)	Letter inviting tribe to attend public scoping meetings for the Ten West Link Project.
4/8/16	Morongo Band of Mission Indians	BLM Project Manager and Palm Springs Field Office Manager attended an in-person meeting with the Morongo Band.
5/26/16	See above recipients (2/16/2016 entry)	Letter inviting tribe to attend the Economic Strategies Workshop on 6/14/16 in Quartzsite, AZ for the Ten West Link Project.
3/13/17	Agua Caliente Band of Cahuilla Indians Augustine Band of Cahuilla Indians Cocopah Indian Tribe Colorado River Indian Tribes Fort McDowell Yavapai Nation Fort Mojave Tribe Gila River Indian Community Morongo Band of Mission Indians Fort Yuma Quechan Tribe Salt River Pima-Maricopa Indian Community Soboba Band of Luiseno Indians Tohono O'odham Nation Torres Martinez Desert Cahuilla Indians Twenty-Nine Palms Band of Mission Indians Yavapai-Apache Nation Yavapai-Prescott Indian Tribe	Letter inviting tribe to attend a Section 106 kick-off meeting in either Blythe, CA (3/23/17) or Phoenix, AZ (3/24/17).
3/16/17	See above recipients. (3/13/17 recipients)	Letter inviting the tribe to become a Cooperating Agency for the Ten West Link Project.
3/16/17	Agua Caliente Band of Cahuilla Indians Augustine Band of Cahuilla Indians Cocopah Indian Tribe Colorado River Indian Tribes Fort McDowell Yavapai Nation Fort Mojave Tribe Gila River Indian Community Morongo Band of Mission Indians Fort Yuma Quechan Tribe Salt River Pima-Maricopa Indian Community Soboba Band of Luiseno Indians Tohono O'odham Nation Torres Martinez Desert Cahuilla Indians Twenty-Nine Palms Band of Mission Indians Yavapai-Apache Nation Yavapai-Prescott Indian Tribe	Letter inviting tribes to become a Cooperating Agency for the Ten West Link Project.
3/17/17	See above recipients. (3/16/17 recipients)	Letter inviting tribes to participate in a tribal field tour of Project alternatives for the Ten West Link Project.
3/23/17	Colorado River Indian Tribes	Participated in Section 106 meeting in Blythe, CA

DATE	TRIBE	DESCRIPTION
3/24/17	Ak-Chin Indian Community Gila River Indian Community	Participated in Section 106 meeting in Phoenix, AZ
3/29/17	Agua Caliente Band of Cahuilla Indians Augustine Band of Cahuilla Indians Cocopah Indian Tribe Colorado River Indian Tribes Fort McDowell Yavapai Nation Fort Mojave Tribe Gila River Indian Community Morongo Band of Mission Indians Fort Yuma Quechan Tribe Salt River Pima-Maricopa Indian Community Soboba Band of Luiseno Indians Tohono O'odham Nation Torres Martinez Desert Cahuilla Indians Twenty-Nine Palms Band of Mission Indians Yavapai-Apache Nation Yavapai-Prescott Indian Tribe	Letter transmitting the Class I and draft Ethnographic reports to tribes and requesting feedback.
3/29/17	Ak-Chin Indian Community	Letter indicating that the tribe does not know of any cultural resources in the Project Area. Please contact if any are found.
3/29/17	Morongo Band of Mission Indians	Palm Springs Field Office Management and George Kline participated in a Project update meeting with Raymond Huaute.
4/10/17	Ak-Chin Indian Community	Letter deferring to the Tohono O'odham Nation for Project consultation.
4/14/17	Colorado River Indian Tribes	Letter from tribe requesting additional information on becoming a Cooperating Agency.
4/18/17	Colorado River Indian Tribes Fort Yuma Quechan Tribe Twenty-Nine Palms Band of Mission Indians	Sixteen members of the CRIT, three members of the Quechen tribe, and two Twenty-nine Palms tribal members attended the first day of the field tour.
4/19/17	Colorado River Indian Tribes Fort Yuma Quechan Tribe	Eleven CRIT members and three members of the Fort Yuma Quechan Tribe attended the second day of the field tour.
5/12/17	Twenty-Nine Palms Band of Mission Indians	Letter response to BLM Class I and Ethnographic reports stating areas of sensitive cultural resources should be avoided.
5/23/17	Colorado River Indian Tribes	Letter declining participation as a Cooperating Agency for the Project. Letter also expresses tribal concerns about Class III information for Segments p-17 and p-18. The tribe provided proposed guidance for government-to-government consultation under Section 106.

DATE	TRIBE	DESCRIPTION
6/9/17	Colorado River Indian Tribes	Letter from tribe indicating a tribal preference for in-person meetings rather than conference calls and formal letters rather than emails. The letter also requests further clarification on the BLM's decision to move forward with a PA vs. MOA.
6/15/17	Ak-Chin Indian Community Cocopah Indian Tribe Colorado River Indian Tribes Fort McDowell Yavapai Nation Fort Mojave Tribe Gila River Indian Community Morongo Band of Mission Indians Fort Yuma Quechan Tribe Salt River Pima-Maricopa Indian Community Soboba Band of Luiseno Indians Tohono O'odham Nation Torres Martinez Desert Cahuilla Indians Twenty-Nine Palms Band of Mission Indians Yavapai-Apache Nation Yavapai-Prescott Indian Tribe	Letter to tribes requesting written tribal input on the Ten West Link Project alternatives.
7/11/17	Colorado River Indian Tribes	Email to tribe requesting a meeting with the tribal council in order to gain feedback on the Project alternatives.
7/13/17	Colorado River Indian Tribes	Letter to tribe in response to CRIT's 5/23/17 letter.
7/13/17	Colorado River Indian Tribes	Letter to tribe in response to CRIT's 6/9/17 letter.
7/14/17	Colorado River Indian Tribes	Letter from tribe inviting the Palm Springs Field Office manager to meet with the tribal council on 8/10/17.
7/18/17	Colorado River Indian Tribes	Letter to tribe accepting CRIT's 7/14/17 invitation to meet with the tribal council on 8/10/17.
7/19/17	Colorado River Indian Tribes Fort Yuma Quechan Tribe Twenty-Nine Palms Band of Mission Indians	Email to tribes inviting them to attend an 8/15/17 meeting on the viewshed analysis for the Project.
7/26/17	Colorado River Indian Tribes	Email to tribe updating acting THPO on the status of the Project and reiterating the contents of the 6/15/17 letter to the tribe requesting input on the Project alternatives.
7/27/17	Fort Yuma Quechan Tribe	Letter from tribe expressing agreement on potential indirect effects to cultural sites and the need for a Class III survey.

DATE	TRIBE	DESCRIPTION
8/1/17	Ak-Chin Indian Community Cocopah Indian Tribe Colorado River Indian Tribes Fort McDowell Yavapai Nation Fort Mojave Tribe Gila River Indian Community Morongo Band of Mission Indians Fort Yuma Quechan Tribe Salt River Pima-Maricopa Indian Community Soboba Band of Luiseno Indians Tohono O'odham Nation Torres Martinez Desert Cahuilla Indians Twenty-Nine Palms Band of Mission Indians Yavapai-Apache Nation Yavapai-Prescott Indian Tribe	Letter to tribes providing an overview of the Project APE and identification efforts for cultural resources and historic properties that the applicant will be required to complete.
8/10/17	Colorado River Indian Tribes	Meeting with the CRIT Tribal Council and Palm Springs Field Office Manager to discuss Project alternatives.
8/15/17	Colorado River Indian Tribes	Letter from tribe containing summary of the 8/10/17 meeting. Letter also requested an opportunity to review the PDEIS.
8/15/17	Colorado River Indian Tribes	Letter from tribe providing CRIT's comments on the 7/19/17 draft of the PA.
8/15/17	Colorado River Indian Tribes	PA writing group meeting to review comments on draft PA.
8/23/17	Colorado River Indian Tribes Fort Yuma Quechan Tribe Twenty-Nine Palms	Letter to tribes transmitting portions of the PDEIS for tribal review. Sections include Cultural Resources, Concerns of Indian Tribes, and Socioeconomics.
8/23/17	Ak-Chin Indian Community	Letter to BLM re; APE and Historic Property Identification.
8/30/17	Colorado River Indian Tribes	Letter from tribe providing additional comments on the PA to those in the 8/15/17 letter.
8/31/17	Colorado River Indian Tribes	PA writing group meeting to review comments on draft PA.
9/1/17	Ak-Chin Indian Community Cocopah Indian Tribe Fort McDowell Yavapai Nation Fort Mojave Tribe Gila River Indian Community Morongo Band of Mission Indians Salt River Pima-Maricopa Indian Community Soboba Band of Luiseno Indians Tohono O'odham Nation Torres Martinez Desert Cahuilla Indians Yavapai-Apache Nation Yavapai-Prescott Indian Tribe	Letter to tribes transmitting portions of the PDEIS for tribal review. Sections include Cultural Resources, Concerns of Indian Tribes, and Socioeconomics.

DATE	TRIBE	DESCRIPTION
9/1/17	Twenty-Nine Palms Band of Mission Indians	Letter from tribe in response to 8/1/17 letter regarding the Project APE. Letter also notes areas of concern for potential indirect effects.
9/6/17	Twenty-Nine Palms Band of Mission Indians	In-person meeting of Palm Springs Field Office manager with Tribal Council to discuss Project and alternatives.
9/18/17	Colorado River Indian Tribes	Letter from tribe expressing concern about sections of the PDEIS and requesting in-person meeting on 10/23/17 to discuss.
9/22/17	Twenty-Nine Palms Band of Mission Indians	Email to tribe acknowledging receipt of 9/1/17 letter.
9/26/17	Ak-Chin Indian Community	Letter from tribe acknowledging receipt of PDEIS sections for review. Tribe will await the DEIS to submit any comments. Letter reiterates that the Ak-Chin will defer to the Tohono O'odham.
10/5/17	Colorado River Indian Tribes	Letter to tribe acknowledging receipt of the tribe's 8/15/17 and 8/29/17 letters regarding the PA. A comment matrix with the BLM's responses is included for reference.
10/6/17	Fort Yuma Quechan Tribe	In-person meeting with tribal cultural committee to give a general update on the Project.
10/10/17	Ak-Chin Indian Community Cocopah Indian Tribe Colorado River Indian Tribes Fort McDowell Yavapai Nation Fort Mojave Tribe Gila River Indian Community Morongo Band of Mission Indians Fort Yuma Quechan Tribe Salt River Pima-Maricopa Indian Community Soboba Band of Luiseno Indians Tohono O'odham Nation Torres Martinez Desert Cahuilla Indians Twenty-Nine Palms Band of Mission Indians Yavapai-Apache Nation Yavapai-Prescott Indian Tribe	Letter to tribes transmitting the Research Design and Work Plan for review.
10/12/17	Colorado River Indian Tribes	Letter from tribe providing comments on the 9/12/17 draft of the PA. The letter also requests that an ethnographic assessment be completed for the Project.
10/23/17	Colorado River Indian Tribes	In person meeting to discuss maps included in the PDEIS.
10/24/17	Colorado River Indian Tribes Quechan Tribe	PA writing group meeting to discuss edits to 9/12/17 version of PA.
11/1/17	Colorado River Indian Tribes	Letter responding to tribe's comments on the PA.
11/1/17	Colorado River Indian Tribes	Letter responding to tribe's comments on the PA.
11/7/17	Colorado River Indian Tribes	In person meeting to discuss documentation of the ethnographic background information.

DATE	TRIBE	DESCRIPTION
11/9/17	Colorado River Indian Tribes	Letter containing tribe's comments on the PDEIS sections related to Cultural Resources and Native American Concerns.
11/15/17	Ak-Chin Indian Community Cocopah Indian Tribe Colorado River Indian Tribes Fort McDowell Yavapai Nation Fort Mojave Tribe Gila River Indian Community Morongo Band of Mission Indians Fort Yuma Quechan Tribe Salt River Pima-Maricopa Indian Community Soboba Band of Luiseno Indians Tohono O'odham Nation Torres Martinez Desert Cahuilla Indians Twenty-Nine Palms Band of Mission Indians Yavapai-Apache Nation Yavapai-Prescott Indian Tribe	Letter containing the 11/13/17 draft of the Project PA for review by all consulting parties and tribes.
11/27/17	Yavapai-Prescott Indian Tribe	Email request from tribe for a copy of the Draft Research Design and Work Plan.
12/1/17	Yavapai Apache Nation	Email stating tribe has no comments on the draft PA.
12/19/17	Colorado River Indian Tribes Quechan Tribe Twenty-Nine Palms Band of Mission Indians	PA writing group consulting parties meeting to review comments on the draft PA.
1/8/18	Colorado River Indian Tribes	Letter acknowledging receipt of CRIT's Government-to-Government Consultation Policy.
2/5/18	Colorado River Indian Tribes	Letter responding to tribe's 12/15/17 comments on the draft PA.
2/09/18	Colorado River Indian Tribes, Tribal Council Meeting	Meeting with Yuma Field Manager to discuss the Project, Section 106 consultation, and other related topics.
2/12/18	Quechen Tribal Council Meeting	Meeting with Yuma Field Manager to discuss the Project, Section 106 consultation, and other related topics.
2/14/18	Ak-Chin Indian Community Cocopah Indian Tribe Colorado River Indian Tribes Fort McDowell Yavapai Nation Fort Mojave Tribe Gila River Indian Community Morongo Band of Mission Indians Fort Yuma Quechan Tribe Salt River Pima-Maricopa Indian Community Soboba Band of Luiseno Indians Tohono O'odham Nation Torres Martinez Desert Cahuilla Indians Twenty-Nine Palms Band of Mission Indians	Email with 2/14/18 version of draft PA for review by consulting parties.

DATE	TRIBE	DESCRIPTION
	Yavapai-Apache Nation Yavapai-Prescott Indian Tribe	
2/21/18	Twenty-nine Palms Band of Mission Indians, Tribal Council Meeting	Meeting with Palm Springs Field Office manager to discuss the Project, Section 106 consultation, and other related topics.
3/13/18	Torres Martinez Desert Cahuilla Indians	Email requesting copies of all cultural reports and to initiate government-to-government consultation.
3/19/18	Ak-Chin Indian Community Cocopah Indian Tribe Colorado River Indian Tribes Fort McDowell Yavapai Nation Fort Mojave Tribe Gila River Indian Community Morongo Band of Mission Indians Fort Yuma Quechan Tribe Salt River Pima-Maricopa Indian Community Soboba Band of Luiseno Indians Tohono O'odham Nation Torres Martinez Desert Cahuilla Indians Twenty-Nine Palms Band of Mission Indians Yavapai-Apache Nation Yavapai-Prescott Indian Tribe	Letter asking if tribe would like to participate in Ethnographic Assessment.
3/21/18	Morongo Band of Mission Indians	Email discussion of Morongo's comments on draft PA.
3/21/18	Torres Martinez Desert Cahuilla Indians	Email response to 3/13/18 email requesting copies of reports and to initiate government-to-government consultation.
3/29/18	Morongo Band of Mission Indians	Meeting to update tribe on various energy projects, including Ten West Link.
4/11/18	Colorado River Indian Tribes	Letter responding to tribe's 3/16/18 comments on the draft PA.
4/17/18	Colorado River Indian Tribes Fort Mojave Tribe Quechan Tribe	PA writing group consulting parties meeting to review comments on draft PA.
4/20/18	Fort Yuma Quechan Tribe	Email requesting more time to consider tribe's involvement in the ethnographic assessment.
4/24/18	Colorado River Indian Tribes	Email asking for a copy of the letter indicating the CRIT's participation in Ethnographic Assessment.
5/29/18	Colorado River Indian Tribes	Letter transmitting May 2018 draft of PA that will be included in the DEIS for comment.
8/30/18	Colorado River Indian Tribes	Letter transmitting the DEIS and informing the recipient of the agency and public DEIS meetings
9/27/18	Colorado River Indian Tribes	Email confirming that BLM's project management consultant (Galileo Project, LLC) sent the CRIT a copy of the DEIS on a flashdrive.
10/1/18	Yavapai-Prescott Indian Tribe	Response from the Yavapai-Prescott Indian Tribe on the Draft EIS. The Tribe indicated that they want to be a consulting party to the Programmatic Agreement.

DATE	TRIBE	DESCRIPTION
11/5/18	Colorado River Indian Tribes	Raymond Suazo requesting a meeting with Dennis Patch of the Colorado River Indian Tribe to discuss the Project, the DEIS, and the PA.
11/7/18	Colorado River Indian Tribes	Email to discuss a date for the BLM to go to CRIT for consultation on the Project DEIS.
11/15/18	Colorado River Indian Tribes	Email discussing dates and format of a meeting between the BLM and CRIT for consultation on the Project DEIS.
11/20/18	Colorado River Indian Tribes	Confirming dates for a BLM / CRIT meeting regarding the Project DEIS in Parker, Arizona.
11/28/18	Twenty-Nine Palms Band of Mission Indians	Twenty-Nine Palms addressing 'applicant proposed measures' and BLM Best Management Practices and requested continued Section 106 consultation.
1/25/19	Twenty-Nine Palms Band of Mission Indians	Email to Twenty-Nine Palms with transmittal of the requested Project sensitivity analysis.
2/15/19	Agua Caliente Band of Cahuilla Indians Ak-Chin Indian Community Augustine Band of Cahuilla Indians Cabazon Band of Mission Indians Chemehuevi Tribe Cocopah Indian Tribe Colorado River Indian Tribes Fort McDowell Yavapai Nation Fort Mojave Tribe Gila River Indian Community Morongo Band of Mission Indians Fort Yuma Quechan Tribe Salt River Pima-Maricopa Indian Community San Manuel Band of Mission Indians Soboba Band of Luiseno Indians Tohono O'odham Nation Torres Martinez Desert Cahuilla Indians Twenty-Nine Palms Band of Mission Indians Yavapai-Apache Nation Yavapai-Prescott Indian Tribe	Ethnographic Literature Review Transmittal letter.
3/14/19	Ak Chin Indian Community Augustine Band of Cahuilla Indians Cocopah Indian Tribe of Arizona Colorado River Indian Tribes Fort McDowell Yavapai Nation Fort Mojave Tribe of AZ Gila River Indian Community Morongo Band of Mission Indians Fort Yuma Quechan Tribe of the Fort Yuma Indian Reservation Salt River Pima-Maricopa Indian Community Soboba Band of Luiseño Indians	Section 106 Consulting Parties Meeting Webinar.

DATE	TRIBE	DESCRIPTION
	Tohono O'odham Nation Torres Martinez Desert Cahuilla Indians Twenty-Nine Palms Band of Mission Indians Yavapai-Apache Nation of the Camp Verde Indian Reservation Yavapai-Prescott Indian Tribe	
3/14/19	Colorado River Indian Tribes Fort Mojave Tribe Gila River Indian Community Quechan Tribe Twenty-Nine Palms Band of Mission Indians Yavapai-Prescott Indian Tribe	PA writing group consulting parties meeting to review comments on draft PA.

3.7.3.3 Project-Specific Concerns of Indian Tribes

Based on communications with Indian tribal representatives from the CRIT, Fort Yuma Quechan Tribe, Twenty-Nine Palms Band of Mission Indians, and the Gila River Indian Community, several issues of tribal concern were identified. These are not all inclusive, and other areas of tribal concerns may be identified during continued Section 106 consultation.

- Existing Access: Tribal representatives from the CRIT, Fort Yuma Quechan Tribe, and the Twenty-Nine Palms Band of Mission Indians all expressed concerns regarding construction of the Project limiting existing access into areas of spiritual use, especially in the Mule Mountains.
- New Access: Tribal representatives from the CRIT, Fort Yuma Quechan Tribe, and the Twenty-Nine Palms Band of Mission Indians all expressed concerns regarding construction of the Project providing new access into areas that were previously inaccessible. Concerns were expressed that new access routes would lead to increased OHV use and lead to the damage and vandalism of historic properties.
- Native Infrastructure and the Interconnection of the Cultural and Natural Environment: the CRIT, Fort Yuma Quechan Tribe, the Torres Martinez Desert Cahuilla Indians, and Twenty-Nine Palms Band of Mission Indians all expressed concerns regarding the interconnectedness of cultural resource sites, natural features of the landscape, and prehistoric trail networks. Concern was expressed regarding the cumulative effects of projects erasing the ancestral footprint of the tribes from the landscape.
- Places of Elevated Spiritual Importance to Tribes: the CRIT, Fort Yuma Quechan Tribe, and Twenty-Nine Palms Band of Mission Indians all expressed concerns regarding specific culturally sensitive areas, especially in the Mule Mountains. Concern was expressed regarding visual impacts to other areas of elevated spiritual importance to tribes, such as the Ripley Intaglio Site. Formal evaluation and consultation on these specific areas as TCPs would need to be conducted by BLM. In consultation (Madrigal [Twenty-Nine Palms Band of Mission Indians] to MacDonald [BLM], 5/12/2017), the Twenty-Nine Palms Band of Mission Indians additionally noted that the Project may cross into a culturally sensitive area, and that a culturally sensitive site not previously identified by the background

research was located within or near the Project. Formal consultation would need to be conducted by the BLM to identify and evaluate these locations, as applicable.

- The Colorado River: the CRIT, Fort Yuma Quechan Tribe, and the Twenty-Nine Palms Band of Mission Indians all expressed concern about the Colorado River, and its influence on their spiritual belief and cultural history. As such, the Colorado River crossing and the indirect and direct effects of its siting on the landscape and potential impact to historic properties are of great concern to Indian tribes.
- Treatment of Human Remains: The CRIT expressed concern regarding the treatment of human remains and mortuary items. It is their belief that if human remains are encountered, they should not be removed but avoided entirely and left in place.
- Intrusion on Pristine Landscapes: The CRIT, Fort Yuma Quechan Tribe, and the Twenty-Nine Palms Band of Mission Indians all expressed desire to restrict Project disturbance to areas already disturbed in order to limit impacts to pristine landscapes. Pristine and undisturbed landscapes are important to tribal spiritual life and are high-energy places that should be preserved.

3.7.3.4 Zone-Specific Conditions

This section discusses known cultural resources within or adjacent to the Project Area that are likely significant to Indian tribes. Not all of the cultural resources discussed have been formally evaluated for NRHP significance; as a result, the term "cultural resources" is used throughout. This is not a comprehensive list; it is expected that additional resources would be identified during the life of the Project through ongoing Section 106 consultation.

East Plains and Kofa Zone

Known cultural resources in the East Plains and Kofa Zone include trails and rock art/petroglyph sites.

Rock Art/Petroglyphs
One site located along the Proposed Action Segment p-06 is reported as containing petroglyphs. Petroglyph sites may have a ceremonial function and are typically places of elevated cultural importance to Indian tribes.

Eagletail Petroglyph Site

The Eagletail Petroglyph Site is located in the Eagletail Mountains within the 5-mile indirect effects analysis area of Alternative Segment d-01. The Eagletail Mountains are a culturally important feature of the environment, and the petroglyph site is of particular importance as a node of cultural activity (Berry 1978). Information on the Eagletail site is restricted; however, the site is well-known among the general public for its impressive collection of petroglyphs, which number in the thousands. The visual setting could be an integral component of the site's importance.

Indian Well Site

The Indian Well Site, AZ-050-1445, consists of two groups of petroglyphs near a spring or seep. Petroglyph sites associated with natural water sources are typically places of elevated cultural importance to Indian tribes. It is located within the 5-mile indirect effects analysis area of Segment p-06. Little information about the site was included in the Class I data.

Trails
Trails are of potential significance to Indian tribes as part of traditional native infrastructure associated with travel across the landscape. The significance of specific trails can be understood in their relationship to specific geomorphological settings, connection to known resource areas, and habitation sites in the regional settlement pattern.

Previously recorded cultural resources that contain prehistoric trail segments are located on Proposed Action Segments p-04 and p-06; and along Alternative Segments d-01, i-03, x-02, and x-04.

Quartzsite Zone

Known cultural resources in the Quartzsite Zone include trails and rock art/petroglyph/intaglio sites.

Known Intaglio and Rock Art Sites
Intaglio, petroglyph, and rock art sites are often of significance to tribal groups. Two known intaglio (i.e., engraved design) sites have been previously documented in the Quartzsite Zone.

A recorded intaglio, site AZ-050-1887, is within the 1-mile corridor of Alternative Segment qn-02.

Site AZ-050-1309 exhibits an intaglio, and prehistoric and historic petroglyphs. This site is within the 1-mile corridor of Alternative Segment qs-02.

Trails
Previously recorded cultural resources that contain prehistoric trail segments are located on Proposed Action Segment p-07, as well as along Alternative Segments qn-02, qs-01, x-06, and x-07.

Copper Bottom Zone

Known cultural resources in the Copper Bottom Zone include trails and rock art/petroglyph/intaglio sites.

CRIT Cultural Resources
The Copper Bottom Zone crosses through CRIT lands. Cultural resources located on CRIT lands have not been identified, as their locations are confidential, and the distribution of confidential data requires special consideration from the CRIT Tribal Council. For alternative segments that include CRIT lands, more information would be required to ensure the identification of potential historic properties.

Known Intaglio and Rock Art/Petroglyph Sites
Intaglio, petroglyph, and rock art sites are often of significance to tribal groups. Three known intaglio/rock art/petroglyph sites have been previously documented in the Copper Bottom Zone.

Site AZ R:7:55 (ASM)/Limekiln Wash Intaglio, is located within the 200-foot-wide corridor of Proposed Action Segment p-13. The site consists of an intaglio.

Site AZ-050-0764 is located within the 200-foot-wide corridor of Alternative Segment i-07. The site consists of an intaglio.

Petroglyph sites are also recorded along Alternative Segments cb-05 and i-08s.

Trails
Previously recorded cultural resources that contain prehistoric trail segments are located on Proposed Action Segments p-09, p-10, p-11, p-12, p-13, and p-14, as well as along Alternative Segments cb-01, cb-02, cb-03, cb-05, cb-06, cb-10, i-06, i-07, x-05, and x-08.

Colorado River and California Zone

Given the presence of the Colorado River, it is not surprising that many of the most sensitive tribal cultural resources are located within this zone. The high density of known cultural resource sites in the Mule Mountains and on the Palo Verde Mesa indicates that this area was significant in the prehistoric past and continues to be important to Indian tribal communities today. Significant known cultural resources within the Colorado River and California Zone include trails and intaglio/petroglyph/rock art sites. The types of prehistoric sites, their distribution and density, as well as the environmental setting of this area offers an insight into the regional settlement and land use pattern operating during prehistory, and demonstrate the interconnectedness of the cultural and natural environment. Two cultural properties, AZ R:10:1(ASM)/Ripley Intaglio Site and Mule Tank Discontiguous Rock Art District, containing archaeological sites CA-RIV-504 and CA-RIV-773, are located within this zone.

The Mule Mountains

The Mule Mountains are to the south of the Project Area and are within line-of-sight of Segments p-17 and p-18. Previous research has suggested that the Mule Mountains contain sensitive archaeological sites including trails and ceremonial sites (AECOM 2012:37, AECOM 2016: 6-40). The mountains also form the center of a regional trail network (Leard and Brodbeck 2017). Bean and Vane (1978:7-27) describe "A rock tank in this area stores up water when it rains, and may have been a permanent water source in past years. Consequently, this is a site where travelers, traders, and ritualists probably stopped off regularly."

The Mule Tank Discontiguous Rock Art District, containing archaeological sites CA-RIV-504 and CA-RIV-773 is located in the northern Mule Mountains to the southwest of the Segments p-17 and p-18. The district includes a natural water catchment and was—and is—an important junction of indigenous travel routes and a focal point of human activity. Numerous trails extend away from this site district and are related to the intaglios and petroglyphs (Brodbeck et al. 2017).

Government-to-government consultation with tribes for this Project have identified the Mule Mountains and surrounding area as a traditional cultural landscape. The consulting tribes consider natural resources to be cultural resources, and that together these resources constitute a cultural landscape that provide a sense of place and identity and are important to their cultural heritage. In addition, the project analysis area is within the ancestral territory of the consulting tribes' that contains multiple, linked features that have cultural and historical meanings attached to them by the peoples who have traveled, used, and interwoven these places into generations of practice that are integral to their way of life.

Palo Verde Mesa

While not a specific property, AECOM (2012) describes the eastern base of the Palo Verde Mesa as a culturally and biologically sensitive area of great importance. Known features in this area include plants, seasonal habitation sites, graves, trails, and important natural resource collection areas (Bean and Vane 1978). Of particular importance are mineral sources and plants used for medicinal purposes and basketry. Mineral resources can include clay for ceramic production and crystal sources for ceremonial purposes.

CA-RIV-1821, an artifact scatter with thermal features and cremains, is a known area of sensitivity to the CRIT and Quechan Tribe of the Fort Yuma Indian Reservation. It is located along an existing access road in Segment p-17.

Trails

Previously recorded cultural resources that contain prehistoric trail segments are located on Proposed Action Segments p-15e, p-16, and p-17, and Alternative Segments ca-01, ca-02, x-15, cb-10, and x-16.

The Coco-Maricopa Trail

The Coco-Maricopa Trail was a heavily traveled east-west trade route connecting the Los Angeles Basin with the Colorado River at the Palo Verde Valley. It also continued eastward to the Maricopa villages on the Gila and Salt rivers in the Phoenix area. The trail was first noted by Euro-Americans in the early 1800s as a route used by the Halchidhoma (Lerch et al. 2016:60). The physical location of the entire trail is not known and only a few segments have been recorded.

Unnamed North-South Trails

While the Coco-Maricopa Trail is the most well-known trail through the area, AECOM (2012:37) also notes the likely presence of north-south running trails through the Palo Verde Mesa. North-south trails have been associated with a specific mourning ritual, or *keruk*, that involved following the path between two spiritual peaks: *Akikwalal* at Pilot Knob near Yuma and *Avikwami* in the Newberry Mountains near Needles. This trail is also referred to as *Xam Kwatcan* Trail (Lerch et al. 2016:59).

Salt Song Trail

In addition to these known and recorded trail systems, the Project Area is within the general area described by the Salt Song Trail (Lerch et al. 2016:61; AECOM 2012:37-38). The Salt Song Trail is considered to be the path to the afterlife used by the Chemehuevi, Southern Paiute, and Hualapai. The Salt Song Trail is described in the Salt Songs, which are a series of songs sung at funerals. The path is metaphysical and the locations identified in the Salt Songs can be considered to be Traditional Origin and Mythological Places. While the trail itself is not considered an on-the-ground cultural resource, consultation received from the Twenty-Nine Palms Band of Mission Indians notes that locations named in the Salt Songs may be tied to physical locations of importance in or around the Project (Madrigal [Twenty-Nine Palms Band of Mission Indians] to MacDonald [BLM], 5/12/2017).

Known Intaglio Sites

Intaglio, petroglyph, and rock art sites are often of elevated significance to tribal groups. Three known intaglio sites have been documented in the Colorado River and California Zone, and may be of significance to Indian tribes:

Site AZ R:10:1 (ASM)/Ripley Intaglio Site is situated on the terraces overlooking the Colorado River on the Arizona side of the state line (Ezzo 1993; Holmlund 1993). The site is located within the 5-mile indirect effects analysis area and includes a set of large anthropomorphic, geometric, and abstract figures etched into the desert surface. The Ripley Intaglio Site may represent a healing dance area (Johnson 1985:18).

Site CA-RIV-000661 is a multicomponent site that consists of a cobble rock alignment and possible intaglio. It is located within the 1-mile corridor of Alternative Segments ca-07 and ca-09.

Site CA-RIV-000662 consists of a cobble rock alignment and possible intaglio. It is located within the 1-mile corridor of Alternative Segment ca-09.

3.8 LAND USE

3.8.1 Applicable Laws, Regulations, Policies, and Plans

The following Federal, state, and local laws, regulations, and standards govern land use in the land use study area.

3.8.1.1 Federal

Lower Sonoran Resource Management Plan

Approximately 2 miles of the Project would cross the Lower Sonoran Field Office planning area in Maricopa County, Arizona. The Lower Sonoran RMP (BLM 2012a) directs management of the Federal surface and mineral estate managed by the Lower Sonoran Field Office primarily in Maricopa County, Arizona, but also includes portions of Pinal, Pima, Yuma, and Gila Counties. The Lower Sonoran planning area encompasses approximately 930,200 acres in south-central Arizona, mostly south and west of Phoenix, and extends south to the US-Mexico border, west to the Yuma County line, and as far east as the town of Globe. The planning area includes remote and undeveloped desert as well as the major metropolitan center of Phoenix and the communities of Goodyear, Buckeye, Gila Bend, Ajo, Globe-Miami, Tonopah, Mobile, Maricopa, Casa Grande, and Sells.

Bradshaw-Harquahala Resource Management Plan

Approximately 24 miles of the Project would cross the Hassayampa Field Office planning area in Maricopa County, Arizona. The Bradshaw-Harquahala RMP (BLM 2010c) directs management of the Federal surface and mineral estate managed by the Hassayampa Field Office within Maricopa, Yavapai, and La Paz Counties in Arizona. The Hassayampa planning area includes over 3 million acres in southern and central Arizona and includes remote and undeveloped zones of desert and mountain ranges, recreation sites, wilderness, and urban areas such as Phoenix, Prescott, Buckeye, and Wickenburg.

Lake Havasu Resource Management Plan

The Project, as proposed, would not cross the Lake Havasu planning area; however, approximately 7 miles of alternative segments would be in this planning area in La Paz County, Arizona. The Lake Havasu RMP (BLM 2007) directs management of the Federal surface and mineral estate managed by the Lake Havasu Field Office in portions of Mohave, La Paz, Yavapai, and Maricopa Counties in Arizona and San Bernardino County in California. The Lake Havasu planning area encompasses approximately 1.3 million acres from the Colorado River from Davis Dam in the north (bordering Nevada/Arizona) to south of Parker Dam. The planning area includes two incorporated cities (Lake Havasu City and Bullhead City) and the town of Parker, Arizona, along with more than a dozen smaller communities. The planning area is known as a recreation destination and includes two NWRs, five designated BLM WAs, and other critical fisheries, migratory waterfowl, and desert plant and wildlife habitats. Seven Indian tribes either currently reside within boundaries of the planning area or have recognized cultural ties to these lands.

A potential amendment to the Lake Havasu RMP would include modifying VRM classes to address Project non-conformance issues.

Yuma Resource Management Plan

Approximately 74 miles of the Project would cross the YFO planning area in Maricopa and La Paz Counties in Arizona, and Riverside County, California. The Yuma RMP (BLM 2010b) directs management of the Federal surface and mineral estate managed by the YFO within Yuma, La Paz, and Maricopa Counties in Arizona, and small portions of Imperial and Riverside Counties in California. The YFO planning area encompasses more than 1.3 million acres along the lower Colorado River in southwest Arizona and southeast California and extends eastward into Maricopa County in Arizona. The area includes remote and undeveloped desert and mountain ranges, as well as wildland-urban interface zones near the city of Yuma, several towns, and other small communities. The YFO planning area surrounds two NWRs, several AGFD-managed areas, and two military installations. These lands also provide a wide range of recreational opportunities and natural and cultural resources to the public. The Yuma RMP also provides management guidance for the BLM-administered New Water Mountains Wilderness that adjoins the Kofa NWR to the north.

Potential amendments to the Yuma RMP include permitting ROWs for the Project outside existing utility corridors, expanding existing utility corridors to accommodate the Project, and modifying VRM classes to address Project non-conformance issues.

California Desert Conservation Area Plan

Approximately 14 miles of the Project would cross the PSSCFO planning area in Riverside County, California, of which 3.7 miles is BLM-administered land. Therefore, this portion of the Project is located on public lands managed under the CDCA Plan of 1980 as amended.

The CDCA Plan, (BLM 1980) as amended, provides the management framework for approximately 25 million acres of California desert, including 12 million acres of public land administered by the BLM. The goal of the Plan is to provide for the use of public lands within the CDCA in a “manner which enhances wherever possible – and which does not diminish, on balance – the environmental, cultural, and aesthetic values of the Desert and its productivity” (BLM 1980).

All discussion in this document of possible RMP amendments within the California Desert District refers to the CDCA Plan, as amended.

The DRECP (BLM 2016a) is a collaborative effort between the BLM, USFWS, California Energy Commission (CEC), and CDFW to provide planning and conservation for 22.5 million acres of California desert. The California desert provides habitat for unique plant and wildlife species, has a rich cultural and historic heritage, and provides a variety of recreational opportunities. The California desert also has abundant solar, wind, and geothermal resources that play a key role in providing renewable energy to the nation's energy supply. The DRECP is a landscape-scale planning document that aims to both facilitate ongoing renewable energy development in the California desert and protect the valuable and sensitive desert resources. The BLM approved the DRECP LUPA to the CDCA Plan in September 2016, which implemented Phase I of the DRECP; this LUPA covers the 10 million acres of BLM-administered land in the DRECP planning area. The DRECP LUPA contains CMAs for each land use allocation, as well as certain types of use. CMAs are the specific set of avoidance, minimization, and compensation measures, and allowable and non-allowable uses for siting, design, pre-construction, construction, maintenance, implementation, operation, and decommissioning activities on BLM land.

The DRECP LUPA included land use allocations that supported the DRECP's overall renewable energy and conservation goals, as well as measures designed to protect other values and uses of the public lands. Key allocations include:

- DFAs – public lands that are available for solar, wind, and geothermal development and ancillary facilities. Applications benefit from a streamlined permitting process with predictable survey requirements and simplified mitigation measures.
- Conservation Designations – public lands designated as National Conservation Lands (NCLs), California Desert National Conservation Lands, ACECs, wildlife allocations, and National Scenic and Historic Trail management corridors to conserve biological, cultural, and other values.
- Recreation Designations – public lands designated as Special Recreation Management Areas (SRMAs) and Extensive Recreation Management Areas (ERMAs) to recognize a range of recreational values in the desert.
- Variance Process Lands (VPL) – public lands potentially available for renewable energy development but require an extensive pre-application process to collect additional information before BLM makes a determination on an application.
- General Public Lands (GPL) – public lands not covered by any of the above designations, although the DRECP creates new management prescriptions for these lands. These lands are potentially available for renewable energy development.

The Project would cross a DFA identified in the DRECP (Appendix 1, Figure 3.11-1c). In addition to being pre-screened and available for renewable energy development and transmission, projects in DFAs benefit from consistent and predictable mitigation requirements identified in the DRECP and can take advantage of the database of resource data collected as part of the DRECP.

Designated Utility Corridors

Designated utility corridors are an important characteristic of the land use study area. The Federal government has designated utility corridors, often 1 or 2 miles wide, that cross lands under its management.

There are two principal directives by which the Federal government has designated such corridors – FLPMA, Section 503, and the Energy Policy Act of 2005, Section 368. Under FLPMA, Section 503, agencies should create such corridors and should require utilities to be co-located within the same general corridors. As a result, BLM and other Federal agencies have designated transportation and utility corridors across their lands through their RMPs. FLPMA, Section 503 states, "The utilization of rights-of-way in common shall be required to the extent practical," and "each right-of-way or permit shall reserve to the Secretary concerned the right to grant additional rights-of-way or permits for compatible uses on or adjacent to rights-of-way granted pursuant to this Act." BLM RMPs in the land use study area discuss multiple designated corridors, most of which have been designated along existing ROWs for natural gas pipelines, highways, and power transmission lines.

Under the Energy Policy Act, Section 368, Congress directed the Federal Departments of Agriculture, Commerce, Defense, Energy, and the Interior to designate corridors on their Federal lands in 11 contiguous western states for oil, gas, and hydrogen pipelines and for electricity transmission and distribution facilities. Arizona and California were among these 11 states. The Departments collaborated on a programmatic EIS and approved a system of 6,000 miles of such corridors, known as the West-wide Energy Corridors (WWECs). There is one such corridor in the land use study area, WWEC 30-52, which encompasses areas of I-10 located on BLM-administered land except for a short stretch between Quartzsite, Arizona, and Blythe, California, where the energy corridor leaves the I-10 alignment. The WWECs have been incorporated into BLM RMPs for the BLM field offices, which overlap the land use study area.

Utility corridors designated via either FLPMA, Section 503 or Energy Policy Act, Section 368 are generally 1 mile wide in the land use study area. They are meant to be locations where new linear facilities should be located as directed by the various BLM RMPs to minimize overall impacts associated with new projects. However, the act of designating a corridor does not confer any land rights; such designation only indicates agencies' preferences for locating utilities in these areas and lets agencies require utilities to be co-located in a corridor unless there is a technical or topographical reason why co-location is not feasible. Any company or agency that wants to establish a transmission line, pipeline, or other utility must individually seek permits and easements from the appropriate Federal agencies and from other landowners such as state, private, and tribal entities.

In some instances, existing utilities cross state and private lands. However, the BLM does not designate utility corridors on land that it does not manage. As such, the Federally designated utility corridors are intermittent – they stop and start across a patchwork of Federal, state, tribal, and private land. On private land or land owned by a non-Federal entity where existing transmission lines or other utilities are present, the utility companies typically hold individual easements across the land.

Farmland Protection Policy Act

Under the Agriculture and Food Act, passed by Congress in 1981, the Farmland Protection Policy Act was established to minimize the impact Federal actions have on irreversible conversion of farmland to other non-agricultural uses. The Act applies to farmland of unique or statewide importance, including prime farmland. A project is subject to meeting the requirements of the Act if it is a Federal project or if the project requires assistance from a Federal agency, such as transportation and electric cooperative construction projects.

National Wildlife Refuge System

The National Wildlife Refuge System Administration Act of 1966 provided guidelines and directives for management of all areas within the USFWS system to that point, as several refuges and other protected areas had been authorized under separate laws or regulations. In addition to providing guidance, the Act established the definition of refuges as, "…areas for the protection and conservation of fish and wildlife that are threatened with extinction, wildlife ranges, game ranges, wildlife management areas, and waterfowl production areas." The law also established the standard of compatibility, whereby the use of refuge lands must be determined to be compatible with the purposes for which said refuge was established, which varies by refuge (USFWS 2016b).

In 1973, the ESA was passed, providing protection for sensitive species and guidelines for managing species determined to be endangered or threatened. This law also redirected management actions on some refuges and over 25 new refuges have been added to the National Wildlife Refuge System under this authority for the purpose of providing protected habitat for listed species (USFWS 2016b).

The National Wildlife Refuge System Improvement Act was passed by Congress in 1997 which amended the National Wildlife Refuge System Administration Act of 1966. This law provided new guidance for management of the National Wildlife Refuge System by directing that the system be managed as a national system of lands and waters devoted to conserving wildlife and maintaining biological integrity of ecosystems. The Act also clarified that certain wildlife-dependent activities are appropriate on refuge lands, such as hunting, strengthened the compatibility determination process, and required the USFWS to undertake conservation planning for each refuge (USFWS 2016b).

Kofa National Wildlife Refuge Management Plan

The Kofa NWR and Wilderness and New Water Mountains Wilderness Interagency Management Plan provides long-term management direction for the USFWS-managed Kofa NWR (BLM, USFWS, and AGFD 1996). The New Water Mountains Wilderness is now managed under the Yuma RMP. The Kofa NWR utilizes USFWS policies on appropriateness (USFWS 2006a) and compatibility (USFWS 2000) when processing ROW applications.

Yuma Proving Ground Integrated Natural Resources Management Plan

The Yuma Proving Ground Integrated Natural Resources Management Plan guides and documents how the YPG will sustain the military mission on YPG while maintaining the health of natural resources. Natural resources management is integrated into the YPG environmental program and military testing and training. The plan's goals and objectives promote sound land management, protection of the environment, and compliance with all relevant laws, regulations, and applicable state and Federal management plans (YPG 2017).

Reclamation Act of 1902

In 1902, Congress passed the Reclamation Act, requiring that water users, specifically settlers in Western states, repay construction costs from which they received benefits, such as irrigation projects. During the early 1900s, Reclamation was known as the Reclamation Service and was focused on developing water projects in Western states with lands owned by the Federal government. Specifically, the Reclamation Service was concerned with developing irrigation solutions for farming. In 1907, the Reclamation Service moved under the purview of the US Department of the Interior (DOI) and was renamed the Bureau of Reclamation. Although the agency has been reorganized several times over the years, the governing laws and regulations remain the same (Reclamation 2016a).

Tribal Lands

In 1865, the Colorado River Indian Reservation was created for the CRIT along the Colorado River in Arizona and California. This is considered a Federal Indian reservation, in that the Federal government holds title to the land in trust on behalf of the tribes (BIA 2016). In addition to the land rights retained by the CRIT, tribal lands and resources are protected by the AIRFA, the Native American Graves Protection and Repatriation Act, the Arizona State Historic Preservation Act, the Arizona Antiquities Act, the California Environmental Quality Act, and California Assembly Bill 52 (**Section 3.6**).

3.8.1.2 State

Arizona

The ASLD manages scattered lands (known as state trust land) within the land use study area, primarily in the eastern portion of the state (Appendix 1, Figure 1.1-1). State trust land was granted to the state of Arizona under the provisions of the Federal Enabling Act that provided for Arizona's statehood in 1912. State trust land is now managed in accordance with the ARS §37-102 et seq. and the AAC R12-5. These statutes and codes govern the processes that the ASLD uses to manage State trust land and provide guidance for particular real estate transactions.

California

The California State Lands Commission (CSLC) has jurisdiction over school lands (i.e., lands granted by the US to California in 1853 to support the public school system) and submerged lands beneath California's navigable rivers, lakes, and streams, classified as sovereign lands; for this Project, this would include lands submerged by the Colorado River. These lands are managed under the State Lands Act, which was established in 1938, and created the CSLC. In addition, California Government Code (CGC) Section 65000-66037 governs planning and zoning, from the state down to the municipal level.

In addition, the California Land Conservation Act of 1965, known as the Williamson Act, is a California law that provides relief of property taxes to owners of farmland and open space land in exchange for a 10-year agreement that the land will not be developed or otherwise converted to another use.

3.8.1.3 Local

Under ARS 11-804 and CGC Section 65100-65107, local land use or planning commissions are required to develop comprehensive land use plans for their counties. Within the Project Area, Maricopa and La Paz Counties in Arizona and Riverside County in California have all created individual county comprehensive or general land use plans to comply with their state regulations. Additional plans specific to certain geographic areas have also been developed to complement the countywide plans. The state statutes in Arizona and California also require that each city, town, or other incorporated area, such as Quartzsite, Arizona, and Blythe, California, adopt a general land use plan.

3.8.1.4 Other Laws, Regulations, and Policies

In addition to the laws, regulations, and policies outlined above, which include those most applicable to land use in the Project Area, other laws, regulations, and policies may also apply. Many of these are discussed in other resource sections for the relevant topics and include:

- Desert Land Entry Act (43 USC 321 et seq.);
- Energy Project Streamlining (EO 13212);
- Indian General Allotment Act (24 Stat. 388);
- Taylor Grazing Act (43 USC 215 et seq.);
- Federal Aviation Regulations Title 14 Part 77;
- Wild and Scenic Rivers Act (16 USC 1271 et seq.);
- Timber Protection Act (16 USC 594);
- DOD – US Army Military Facility Right-of-Way Grant Authorizations, BLM Land Withdrawal
- CRIT – Tribal Land Occupational Use Conditional Permits
- Arizona Corporation Commission (ARS 40-360 through 40-360.13)
- Arizona Department of Transportation (ARS 20-7053, AAC R17-3-501 through 509)
- California Desert Protection Act (Public Law 103-433);
- California Department of Transportation (California Streets and Highways Code 660-711.21, California Code of Regulations 1411.1-1411.6)
- California Department of Water Resources – Encroachment/Crossing Permit
- Maricopa County – Road/Highway Encroachment/Crossing Permit
- La Paz County – Road/Highway Encroachment/Crossing Permit and Overhead Utility Road Crossing Permit
- Riverside County Ordinance No. 348 (Section 18.29 of Article XVIII)
- Palo Verde Irrigation District – Encroachment/Crossing Permit

- Southern California Gas Pipeline – Pipeline Encroachment/Crossing Permit
- El Paso Natural Gas Pipeline – Pipeline Encroachment/Crossing Permit

3.8.2 Study Area

The general land use study area is a 4,000-foot corridor encompassing the Proposed and Alternative segments. As land uses and ownership can change with each individual parcel of land regardless of the size of the parcels, a 4,000-foot-wide corridor is sufficient to capture the land uses and jurisdictions that may be affected by the Project. The land use study area also encompasses 200-feet on either side of the alternative SCS 12kV distribution line.

For military land, land uses were examined within a specific military land use study area. A 2-mile-wide study area was used for military land because typically the DOD requests large buffers around their properties to both protect the public and provide secure grounds for military uses. A 2-mile-wide corridor supports an evaluation of activities that take place around a military base.

3.8.3 Existing Conditions

3.8.3.1 Land Jurisdiction

Figure 1.1-1 (Appendix 1) provides an overview of land jurisdiction in the land use study area and Table 3.8-1 presents the percentages of each jurisdiction in the study area. Broad areas are Federally owned; these are managed by the US DOI (the BLM, Reclamation, or the USFWS) or by the DOD. Tribal lands of the CRIT are located along the Colorado River, mostly on the Arizona side of the river. Also present are ASLD lands that are often leased to companies or individuals for grazing or agricultural use. There are no California state lands in the land use study area with the exception of the Colorado River (over which the CSLC has jurisdiction). Private lands, including lands with residential, commercial, agricultural (including those with water district fee-ownership or program enrollment), and other uses, are mostly smaller parcels.

Table 3.8-1 Land Jurisdiction in the Land Use Study Area

LEVEL OF GOVERNMENT	ACRES	PERCENT OF TOTAL
Federal [1]	115,405	68
State [2]	17,053	10
Local [3]	340	<1
Tribal	1,531	1
Private	36,486	21
TOTAL	170,795	—

[1] Military lands are included in the Federal category.

[2] Transportation lands are included in the state category, even though some may be Federally owned.

[3] Public/semi-public and open water are included in the local category, even though some may be owned by other entities.

Land Management Agencies and Land Use Plans

Federal, state, and local land management areas and associated land use plans are described below. Planning boundaries are shown on Figures 3.8-1 through 3.8-4 (Appendix 1).

Federal Lands

Several Federal agencies own and manage land in the land use study area, and each agency has a different mission guiding the management of the land. The Federal lands in the land use study area and the missions of the agencies include:

- **BLM**. BLM-administered land encompasses 85,485 acres or 50 percent of the land use study area, principally in Arizona. BLM-administered land is public land managed for multiple uses, including, but not limited to, recreation by the public, wildlife conservation, energy development, livestock grazing, and protection of wild horses and burros. Each field office manages a particular planning area (Appendix 1, Figure 1.1-1), which tend to contain similar resource characteristics throughout the area. BLM-administered land is managed in accordance with the FLPMA and the principles in the BLM Land Use Planning Handbook H-1601-1 (BLM 2005).
- **Kofa NWR (USFWS)**. Kofa NWR is located about halfway between the two termini of the Project. The refuge was originally established to protect bighorn sheep, and the mission of the USFWS is to first and foremost protect wildlife and wildlife habitat.
- **Reclamation**. Reclamation land is present near the Colorado River on both the Arizona and California sides, and also near the CAP canal. The mission of Reclamation is to manage, develop, and protect water and related resources in the interest of the American public; therefore, these lands are dedicated to management of water resources for the public in southern California and Arizona.
- **YPG (DOD)**. The YPG is located southwest of Quartzsite, Arizona. The primary mission of the YPG is to ensure that the weapon systems and equipment issued to soldiers function safely and as intended.

In addition to the information provided in RMPs, the BLM maintains a database of existing and pending authorizations called the LR2000 database. The Legacy Rehost 2000 (LR2000) database is spatially referenced to the Public Land Survey System (PLSS). The PLSS divides public lands into smaller survey areas, and encompasses much of the land area of 30 southern and western states (USGS 2016b). To parse the PLSS into manageable portions, public land is divided into 6-mile-square townships, which are further divided into 1-mile-square sections. The LR2000 data are mapped by PLSS section and contain existing and pending land use authorizations by the BLM, such as ROWs, leases, and easements. Some authorizations are associated with just one section; others, like those for pipelines and transmission lines, stretch across dozens of sections and are recorded once per section. There are many hundreds of BLM authorizations within the land use study area, including authorizations for oil and gas and mining (HDR 2017d).

BLM Hassayampa Field Office

The Hassayampa Field Office implements both the Bradshaw-Harquahala RMP and the Agua Fria National Monument RMP, which apply to lands primarily within Maricopa and Yavapai Counties in central and western Arizona (BLM 2010c). The Bradshaw-Harquahala planning area encompasses 896,100 acres administered by the Hassayampa Field Office. In preparing the RMP, the field office reviewed several plans relevant to the Project Area to ensure consistency with these plans to the maximum extent possible, including:

- Maricopa County 2020, Eye to the future Comprehensive Plan (Revised);
- Maricopa Associations of Governments (MAG): Desert Spaces Environmentally Sensitive Development Areas Policies and Design Guidelines; and
- Wildlife 2006: The Arizona Game and Fish Department's Wildlife Management Program Strategic Plan.

The Hassayampa Field Office has identified utility corridors as a specific land use allocation and has listed the types of projects for which utility corridors may be designated. These types of projects include:

- Natural gas and other pipelines at least 10 inches in diameter;
- Electric transmission facilities accommodating 115kV or greater voltage lines; and
- Substantial canals delivering water to urban areas.

The Hassayampa Field Office has also identified six utility corridors in its planning area that have at least one authorized ROW for a major utility line; each of these is between 1 and 2 miles in width. To minimize impacts on BLM-administered land, new infrastructure should be within these designated corridors. The BLM has the authority to designate new utility corridors for facilities that fall within one of the above-listed categories; however, other land uses, such as avoiding sensitive or special resources, must be taken into consideration.

BLM Lower Sonoran Field Office

The Lower Sonoran Field Office implements the Lower Sonoran RMP, which applies to lands mostly within Maricopa County in central and western Arizona (BLM 2012a). The Lower Sonoran planning area encompasses approximately 930,200 acres of BLM-administered land.

The Lower Sonoran Field Office has identified utility corridors as a specific land use allocation in which all compatible major linear utilities will be allowed. The RMP identified eight corridors within the planning area, all of which are 1 mile wide. The I-10 and DPV1 corridors in the Lower Sonoran planning area are in the vicinity of the Project Area – the I-10 corridor runs for 1 mile on BLM-administered land within the planning area, and the DPV1 corridor runs for almost 9 miles on BLM-administered land within the planning area. The intent of the utility corridors is to minimize impacts on BLM-administered land; however, the RMP states that linear facilities may be authorized outside of the utility corridor if they are due and necessary and connecting a generating facility to the closest designated utility corridor.

BLM Lake Havasu Field Office

The Lake Havasu Field Office implements the Lake Havasu RMP, which applies to lands within La Paz, Maricopa, Mohave, and Yavapai Counties in western Arizona, as well as San Bernardino County in California (BLM 2007). The Lake Havasu planning area encompasses 1.3 million acres of BLM-administered land. In preparing the RMP, the field office reviewed several plans relevant to the Project Area to ensure consistency with these plans to the maximum extent possible, including:

- La Paz County Comprehensive Plan (Revised);
- Lower Colorado River Multi-Species Conservation Program; and
- California Desert Conservation Area Plan of 1980.

The Lake Havasu Field Office has identified utility corridors as a land use authorization pursuant to Title 5 of the FLPMA. Uses authorized by a ROW issued under Title 5 may include access roads, power lines, telephone lines, fiber optic systems, and communication facilities.

The Lake Havasu Field Office has identified 12 utility corridors in its planning area that are either existing corridors or additional/revised corridors tying together existing corridors. Each of these 12 corridors is between 1 and 2 miles in width. To minimize impacts and the proliferation of separate ROWs on BLM-administered land, new infrastructure should be within these identified corridors.

BLM YFO

The YFO implements the YFO RMP, which applies to lands primarily within La Paz and Yuma Counties in southwestern Arizona, and Imperial and Riverside Counties in southeastern California (BLM 2010b). The YFO planning area encompasses approximately 1.3 million acres. In preparing the RMP, the field office reviewed several plans relevant to the Project Area to ensure consistency with these plans to the maximum extent possible, including:

- US Army's Yuma Proving Ground Integrated Natural Resources Management Plan;
- La Paz County Comprehensive Plan (Revised);
- Lower Colorado River Multi-Species Conservation Program;
- Maricopa County Managing for Results Strategic Plan; and
- Riverside County General Plan.

Per the RMP, new utility facilities within these corridors should avoid impacts to natural and cultural resources in ACECs, Special Cultural Resource Management Areas, and WHMAs to the greatest extent possible.

The YFO has identified eight utility corridors in its planning area. To minimize impacts on BLM-administered land, new transmission ROWs should be within these designated corridors, unless it can be demonstrated that locating a new transmission ROW outside of a designated corridor is the only practicable option. The I-10, DPV1, El Paso Natural Gas, Parker Blaisdell, and Highway 95 California corridors in the Yuma planning area are in the vicinity of the Project Area. Within the planning area, the I-10 corridor runs for 79 miles, the DPV1 corridor runs for 84 miles, the El Paso Natural Gas corridor runs for 72 miles, the Parker Blaisdell corridor runs for 86 miles, and the Highway 95 California corridor runs for 26 miles.

BLM Palm Springs-South Coast Field Office

The BLM's management of Federal lands within the land use study area in California is directed by the 1980 CDCA Plan (BLM 1980), which was amended in 2002 by the Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan (BLM 2002b). This plan applies to portions of the public lands managed by the BLM in the Palm Springs-South Coast Field Office planning area within eastern Riverside County. The NECO planning area is located primarily in the Sonoran Desert of San Bernardino, Riverside, and Imperial Counties in southeastern California.

The DRECP LUPA (BLM 2016a) further amended the CDCA Plan. This land use plan amendment was developed to streamline development on public land while maintaining multiple use and sustained yield of public lands. Along with the management considerations in the land use plan amendment, the BLM will continue to manage resources and uses on BLM-administered land by following existing land use planning decisions under the NECO Plan. In preparing the CDCA Plan, the NECO Plan, and the DRECP land use plan amendment, the Palm Springs-South Coast Field Office coordinated with Federal, state, local, and tribal officials and reviewed several plans that outline policies and guide activities of the agencies and organizations. The DRECP also allows the development of new transmission line infrastructure outside of utility corridors within DFAs.

The Palm Springs-South Coast Field Office has identified 12 utility corridors in its planning area. To minimize impacts on BLM-administered land, new infrastructure should be within these designated corridors, each of which is between 1 and 2 miles wide.

Kofa National Wildlife Refuge

The USFWS manages the National Wildlife Refuge System, of which Kofa NWR is a part. The USFWS's mission is to protect and manage wildlife in the interest of the American people and to provide wildlife-oriented recreational and educational opportunities. Kofa NWR was first established as the Kofa Game Range in 1939 to allow for the recovery of declining bighorn sheep populations; the USFWS and the US Grazing Service jointly managed the game range at that time. In 1946, the USFWS and the newly established BLM co-managed the Kofa Game Range until Public Law 94-223 gave sole jurisdiction of Kofa Game Range to the USFWS and the area was renamed Kofa NWR (USFWS and BLM 1997).

In 1990, much of the Kofa NWR was designated as wilderness under the Arizona Desert Wilderness Act. The designated WAs within Kofa NWR are managed by the USFWS under the Kofa National Wildlife Refuge and New Water Mountains Wilderness Interagency Management Plan (1996), and the New Water Mountains WA is now managed by the BLM YFO under the YFO RMP, which references the Interagency Management Plan. Within the 666,641-acre Kofa NWR, 510,900 acres are designated as wilderness. These areas are discussed further in Section 3.11.

The USFWS and the BLM developed the Kofa National Wildlife Refuge and Wilderness and New Water Mountains Wilderness Interagency Management Plan and Environmental Assessment (EA) to describe the management objectives for the refuge:

- Preservation of wilderness values;
- Wildlife and habitat management;
- Recreation, legal access, and public information; and
- Minerals management.

Based on these four objectives, multiple uses are allowed in the refuge; however, the majority of the land is managed for wildlife habitat and wilderness. Public access is allowed into parts of Kofa NWR for hunting, camping, rock climbing, rappelling, hiking, observing wildlife, photography, sightseeing, and environmental education; these activities have been deemed by the USFWS to be compatible with the purposes of the refuge.

Within the Interagency Management Plan, shared land uses are described, which include use by the DOD and designated utility corridors. Along the 58-mile, shared boundary with the YPG, the DOD has permission to use 171,000 acres of land within Kofa NWR from the ground surface up. In addition, four existing utility ROWs are present within the refuge. The four existing utility ROWs within the refuge boundary include:

- American Tower, which includes a microwave repeater tower and a 33-foot-wide access road;
- Arizona Public Service, which includes a 20-foot-wide 12kV transmission line ROW;
- El Paso Natural Gas Company, which includes a 130-foot-wide ROW for four natural gas pipelines plus an access road; and
- Southern California Edison Power Company, which includes a 160-foot-wide 500kV transmission line ROW (USFWS and BLM 1997).

The El Paso Natural Gas ROW is adjacent to the DPV1 ROW. Each is governed both by the Interagency Management Plan and by 50 CFR 29.21 (Rights-of-Way General Regulations), which prescribes the procedures for filing applications and the terms and conditions under which the USFWS may grant ROWs over and across lands it administers. To grant use of a ROW, the USFWS would need to find the use appropriate for the refuge based on the conditions in chapter 603 FW 1 of the USFWS Fish and Wildlife Service Manual and would also need to conduct a compatibility determination if the use is found appropriate.

Reclamation

The Lower Colorado Region manages, develops, and protects water and related resources in southern California, southern Nevada, Arizona, and small parts of Utah and New Mexico. Reclamation manages land within the land use study area primarily surrounding the CAP canal north and west of the Delaney Substation near Tonopah, Arizona, and near the Colorado River on the Arizona side north of the YPG. The primary responsibility of Reclamation in this area is to manage water supplies for more than 2.5 million acres of land and 23 million people, as well as to generate hydroelectric power in the amount of 5 to 6 billion kilowatt-hours annually

(Reclamation 2015). Under the authority of the Colorado River Front Work and Levee System Act, Reclamation maintains the conveyance channel, banklines, levee systems and control structures along the Colorado River. In addition, Reclamation manages public recreation areas at some of its facilities for which authorization for use is not required. However, Reclamation can authorize other entities to use their lands on a case-by-case basis following a determination regarding whether the requested use is compatible with the land use and management plans for that area. Typical authorized uses include special events, utility crossings, communication lines and sites, livestock grazing, and farming. Authorizations issued by Reclamation are governed by 43 CFR 429.3 (Use of Bureau of Reclamation Land, Facilities, and Waterbodies).

DOD YPG

The 870,000-acre YPG is the only military land in the military land use study area. The Integrated Natural Resources Management Plan for the YPG states that the site is geographically one of the largest military installations and is "… a premier desert test and evaluation facility for the US Army, the DOD, and allied nations …" (YPG 2017). Crossing military land would require a ROW easement from the DOD, similar to easements required from other government agencies. Military lands are further discussed in Section 3.8.3.6.

Tribal Lands

In 1865, the Colorado River Indian Reservation was created for the CRIT along the Colorado River in Arizona and California. Public Law 109-47 (2005) corrected the southern boundary; a portion of the reservation is therefore within the land use study area (Appendix 1, Figure 1.1-1). The reservation runs roughly from I-10 and Ehrenberg, Arizona, north to Parker, Arizona, an area more than 40 miles long. Parts of the reservation are west of the Colorado River in California. Aside from rights pertaining to existing users or landowners, all other rights were transferred to the CRIT. While the CRIT manage the reservation, the BIA is charged with working with tribal governments in the administration and management of trust land and the natural resources within and is, therefore, a resource for the CRIT regarding land use and management. Tribal lands are further discussed in Section 3.8.3.8.

State Land

Arizona

Although state trust lands are managed by the ASLD under the trust system, there is currently no comprehensive plan that guides management of state trust lands, nor are there any specific projects or plans of note in the land use study area. However, state trust lands are managed as a perpetual trust with a mission to generate revenue for public education and other public services. It is important to the state to retain development rights and the value of these lands (M. Horowitz, ASLD, personal communication, September 9, 2016).

California

The CSLC administers school lands and sovereign lands under the California States Lands Commission Strategic Plan (2016 – 2020). This plan is used to administer the 4 million acres of sovereign lands and 5.5 million acres of school lands in California. Transmission lines may be granted a lease on sovereign lands (CSLC 2015).

Local

Each county within the land use study area has a comprehensive or general plan that includes land use classifications. These are community plans that are intended to separate incompatible land uses and provide for land uses that are community priorities. They provide adopted land use maps of residential, commercial, industrial, agricultural, recreational, and other land uses. These comprehensive plans typically classify land by reflecting current uses, but also are designed to plan for future uses in areas that might now be considered vacant or that the municipality anticipates acquiring over time or hopes to acquire. In addition, the comprehensive county plans include more specific plans for particular geographic areas and each city or town also has an individual land use plan.

<u>Maricopa County</u>

The Vision 2030: Maricopa County Comprehensive Plan (Maricopa County 2016) states that Maricopa County includes extensive Federally managed land, open spaces, and unincorporated areas as well as areas with unique land uses such as utility infrastructure. The plan's land use policies include maintaining public awareness about utility lines and protecting the utility ROWs with buffers by defining the land with the appropriate land use category in unincorporated areas. Because a large proportion of the area is Federally owned and managed, the plan states that "Maricopa County reaffirms its commitment to coordinate with Federal agencies, especially in areas adjacent to Federal land, to help avoid potentially adverse impacts from new development." The plan does not specifically discuss regulations or policies for transmission lines or other utilities; however, the plan includes a Land Use Policy that states, "Maricopa County supports land use buffers and compatible land use strategies near existing and future high voltage electric utility line corridors." This Land Use Policy points toward the use of corridors for transmission lines.

The county plan identifies land uses within different geographic areas, each of which has its own area plan. The Project would be located in the area covered by the Tonopah/Arlington Area Plan (Maricopa County 2000). This area plan has more area-focused goals and objectives based on local involvement than does the Maricopa County Comprehensive Plan. The primary goal of the land use part of the area plan is to "[p]romote efficient land development that is compatible with adjacent land uses, is well integrated with the transportation system, and is sensitive to the natural environment." The area plan describes the Retail Electric Competition Rule, which was passed by the Arizona Corporation Commission (ACC) in 1996 and made changes to the electrical monopolies that were in place by deregulating electrical generation. With the passing of this rule, more opportunities exist for energy providers to locate new infrastructure in the area surrounding the Palo Verde Nuclear Generating Station (PVNGS). While the potential exists for the number of transmission lines to increase in the area, the area plan does not designate specific corridors for utility infrastructure or provide detail on how commercial and industrial land development, such as development of transmission line infrastructure, should occur.

Also applicable to the Project Area in Maricopa County is Desert Spaces: An Open Space Plan for the [Maricopa Association of Governments] MAG (Design Workshop, Inc. 1995). This plan was adopted in 1995 by the MAG to, "preserve, protect, and enhance the mountains and foothills, rivers and washes, canals and cultural sites, upland desert vegetation, wildlife habitat, and existing parks and preserves" by establishing a network of open spaces. The plan also established policies to guide development and protection of each resource category; however, the plan is conceptual only and not regulatory in nature. Under this plan, utility corridors are considered as open space in

Maricopa County and, therefore, can contribute to meeting the goals and objectives of the plan. However, a specific policy regarding placement of utility corridors was identified with regards to water resources: "Where appropriate, develop other 'linear' improvements such as roads and utility corridors to run parallel to, but not in, the regionally significant rivers and washes."

La Paz County

The La Paz County Comprehensive Plan (La Paz County 2005) describes the critical planning issues in the county as well as land use goals and objectives to achieve those goals. The plan includes a policy to determine ways to "… minimize the visual impact of the built environment on desert vistas and mountain views …" when evaluating new development. Although the plan does not expressly identify utility corridors for transmission infrastructure, it states that "[a]ny new industrial development should be located along a major arterial corridor, rail connection, [or] state highway, or in close proximity to the Interstate corridor."

Riverside County

The Riverside County General Plan (Riverside County 2017) governs how land in Riverside County is to be used, describes the issues and policies to be considered, and describes future plans for use and development of county land.

Several objectives from the plan apply to transmission lines – objectives such as ensuring that development and conservation land uses do not infringe on existing essential public facilities and public utility corridors (LU 31.6), taking into consideration utility easements and linear ROWs in land development and conservation proposal reviews (LU 31.7), and avoiding crossing ridge tops to avoid bird collisions (Riverside County 2017, p. LU-37).

In addition, Riverside County has designated certain geographic areas to have their own area plans. The Palo Verde Valley Area Plan (Riverside County 2015b) encompasses areas adjacent to the Colorado River on the California side but does not include the city of Blythe, which is governed by its own plan, as discussed below. The area plan does not define land specifically for the use of utility infrastructure; however, it is intended to be consistent with the Riverside County General Plan, the City of Blythe General Plan, and the City of Blythe Colorado River Corridor Plan. This plan includes a land use concept that is intended to preserve the agricultural character of the study area.

Town of Quartzsite

The Town of Quartzsite General Plan (Town of Quartzsite 2014) identifies current land uses, land use issues identified by the public, and long-range planning goals for the town. One of the goals is to promote an efficient land use development pattern where utility infrastructure is available. Although the plan does not identify particular corridors for utilities, the strategy supporting this goal is to coordinate infrastructure improvement with existing and projected development activity and, therefore, place utilities in areas that are beneficial to the community and complement the plan.

City of Blythe

The City of Blythe General Plan 2025 (City of Blythe 2007a) documents the city's vision statement, current land uses, and future land use plans. The plan includes policies for open space areas, the category within which utility corridors fall. Although specific corridors are not identified for utility infrastructure, the guiding policies indicate the city's intent to protect existing uses (e.g., agriculture, recreation, sensitive habitats) and minimize conflicts between urban and open space uses by requiring buffers and greenbelts. Policies specific to utility lines or corridors include:

- Guiding Policy 34 for New Residential Neighborhoods: Encourage the visual enhancement of utility services. Utility services are often located and installed in a manner that negatively detracts from the neighborhood's appearance. Such facilities should be sited so as to minimize their detraction from the built environment.
- Implementation Policy for New Residential Neighborhoods: Require that all new utility installations maximize their visual harmony with the neighborhood. Under this policy, placing utility services underground with all new residential construction, siting utility vaults and appurtenances away from high-visibility areas, and screening utility facilities when feasible are encouraged.

The City of Blythe General Plan is amended to include the Colorado River Corridor Plan (City of Blythe 2007b), which specifically addresses growth along the Colorado River in the city of Blythe. The city's vision for the plan area includes balancing open space, recreational land uses, and housing needs along the river as well as providing guidance for commercial development. Although the Colorado River Corridor Plan does not discuss transmission line corridors or utility ROWs, this plan is intended to be consistent with the City of Blythe General Plan, and the city would assess placement of these ROWs in the same manner.

3.8.3.2 Land Uses

This subsection discusses the types of land uses identified in the land use study area. The land use study area includes mainly rural, sparsely populated lands. A majority of the land use study area is comprised of Federal lands (Table 3.8-1). Figures 3.8-1 through 3.8-4 (Appendix 1) illustrate specific land use classifications for the four geographic areas in the study area based on land use data from the counties' land use plans, as well as information from the Town of Quartzsite and the City of Blythe General Plans, the Tonopah/Arlington Area Plan, the Palo Verde Valley Area Plan, and the Colorado River Corridor Plan. The figures also display the planning boundaries for the individual BLM RMPs, and the planning area boundaries for each county and city land use plan.

Where the Proposed and Alternative segments cross Federal lands, they are mostly within existing designated utility corridors. Of the 58.3 miles of Proposed Action segments that fall on BLM or Reclamation land, 98 percent also overlap designated utility corridors. Of the 183.3 miles of Alternative Segments that fall on BLM or Reclamation land, 62 percent also overlap designated utility corridors. Where the Proposed segments cross non-Federal lands, or lands managed by the USFWS or DOD, they are entirely located parallel to the existing DPV1 ROW. While some of the Alternative Segments are located parallel to existing utility ROWs, several Alternative Segments cross outside designated utility corridors between the Proposed and Alternative segments routed along I-10.

While a majority of the land within the study area is under Federal jurisdiction, the segments also cross privately owned land in three counties primarily supporting recreational and agricultural activities.

Residential

The land use study area as a whole includes large areas of public land and relatively little private residential land. Each county and city plan list the types of residential land use that are allowed in certain areas, including high-density, medium-density, low-density, and rural residential. These categories specify different densities of dwelling units allowed, ranging from 1 or fewer dwellings per acre up to multi-family units holding 50 or more units per acre. Residential land use is specifically identified in the La Paz and Riverside County plans, the Palo Verde Valley Area Plan, the Tonopah/Arlington Area Plan, the Blythe and Quartzsite city plans, and the Colorado River Corridor Plan. The communities of Ehrenberg and Ripley in Arizona do not have their own plans and are, therefore, addressed in the relevant county plans. While there may be some small areas outside the county, area, or city land use planning areas that are privately owned and contain a residence, the land not included in these land use plans is generally under the jurisdiction of a Federal or state agency.

Approximately 12,799 acres in the land use study area are classified as residential, accounting for 8 percent of the total area within the land use study area (HDR 2017d). The majority of that is classified as Rural Residential (just under 12,000 acres), indicating that the land use study area is primarily rural in nature with few residences on relatively large parcels. Similarly, the majority of the Project lies within La Paz County, which contains only 0.3 percent of the total population of Maricopa, La Paz, and Riverside Counties, combined. As further discussed in Section 3.15, the census block groups in La Paz County contain only 0.6 percent of the total housing units between Maricopa, La Paz, and Riverside Counties combined, which is also an indicator of the rural nature of the Project.

Agriculture including Williamson Act Lands

Agricultural lands are present throughout the land use study area, but the majority are in California (Appendix 1, Figure 3.8-5 and 3.8-6). A portion of the private agricultural lands in California are in fee-ownership by a local water district or are in local water district agricultural programs. The BLM and ASLD have authorized grazing on their rangelands, and ASLD also leases some state trust land for agricultural purposes. Approximately 19,091 acres of land in the land use study area are classified as agricultural (11 percent) (HDR 2017d); however, these lands do not include all of the land in the land use study area used for grazing (Section 3.9).

NRCS Classifications

Farmland in the land use study area is classified as prime farmland, farmland of statewide or local importance, or unique farmland.

The primary farming areas are in the Harquahala Valley region of Maricopa County, Arizona and the Palo Verde Valley area of Riverside County, California. Crops contributing to the largest amount of farmland acres in the land use study area include alfalfa (for hay), wheat, and cotton (Riverside County 2015c, Maricopa County 2012). Agricultural land in California also includes lands under Williamson Act contracts (Section 3.8.1.2).

The NRCS produces agricultural resource maps based on soil quality and land use. As part of this mapping project, the NRCS created a set of definitions known as the Land Inventory and Monitoring criteria (NRCS 2016c). These criteria classify the land's suitability for agricultural production, including the physical and chemical characteristics of soils, as derived from NRCS soil survey data and maps as well as specific land uses (NRCS 2016d). The NRCS classifications do not indicate that land is currently agricultural in use; rather, land is classified based on its potential suitability for agricultural production. The NRCS important farmland categories associated with the Land Inventory and Monitoring criteria in the Project Area are:

- **Prime farmland**[5]**:** Land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses.
- **Farmland of statewide importance:** Land that does not meet the criteria for prime or unique farmland and is defined by the appropriate state agencies. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods.
- **Farmland of unique importance:** Land other than prime farmland that has the soil characteristics needed to economically produce sustainable high yields of specific high-value food and fiber crops when properly managed. Unique farmland is not based on national criteria and can, therefore, differ by area.
- **Not prime farmland:** Lands that are identified as agricultural, but not as prime or important farmlands.

The California Department of Conservation (DOC) established the Farmland Mapping Monitoring Program to assess the location and quality of agricultural lands and the conversion of these lands to other uses in California. The DOC uses the NRCS important farmland categories described above with slight modifications to identify agricultural lands in California. Modifications made by the DOC to NRCS important farmland classifications include: prime farmland and farmland of statewide importance must be irrigated; farmland of local importance is identified by local advisory committees and varies by county; and the DOC has created a "Grazing Land" designation, which is unique to California (DOC 2016). The state of Arizona does not have a similar program to further define the important farmland categories established by the NRCS. Figures 3.8-7a through 3.8-7c (Appendix 1) show farmland classifications in the land use study area; Table 3.8-2 provides detailed NRCS-classification acreages within the study area of each segment.

[5] This term includes: 1) prime farmland if irrigated; 2) prime farmland if irrigated and reclaimed of excess salts and sodium; and 3) prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season (HDR 2017e).

Table 3.8-2 Acres of NRCS-classified Farmlands and Williamson Act Lands

SEGMENT LABEL	FARMLAND OF STATEWIDE IMPORTANCE	FARMLAND OF UNIQUE IMPORTANCE	NOT PRIME FARMLAND [A]	PRIME FARMLAND IF IRRIGATED	PRIME FARMLAND IF IRRIGATED AND RECLAIMED [B]	PRIME FARMLAND IF IRRIGATED AND NO FLOODING [C]	WILLIAMSON ACT LANDS
East Plains and Kofa Zone							
p-01	0.0	0.0	12,595.2	136.1	0.0	0.0	0.0
p-02	0.0	0.0	515.1	0.0	0.0	0.0	0.0
p-03	0.0	0.0	550.7	0.0	0.0	0.0	0.0
p-04	0.0	0.0	0.0	0.0	0.0	0.0	0.0
p-05	0.0	0.0	0.0	0.0	0.0	0.0	0.0
p-06	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d-01	0.0	426.4	3,508.3	2,672.6	0.0	2,099.6	0.0
i-01	0.0	0.0	4,001.4	0.0	0.0	0.0	0.0
i-02	0.0	0.0	0.0	0.0	0.0	0.0	0.0
i-03	0.0	0.0	4,388.7	0.0	0.0	0.0	0.0
i-04	0.0	0.0	0.0	0.0	0.0	0.0	0.0
in-01	0.0	0.0	0.0	0.0	0.0	0.0	0.0
x-01	0.0	0.0	3,806.5	0.0	0.0	0.0	0.0
x-02	0.0	0.0	2,550.5	0.0	0.0	0.0	0.0
x-03	0.0	0.0	0.0	0.0	0.0	0.0	0.0
x-04	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SEGMENT LABEL	FARMLAND OF STATEWIDE IMPORTANCE	FARMLAND OF UNIQUE IMPORTANCE	NOT PRIME FARMLAND [A]	PRIME FARMLAND IF IRRIGATED	PRIME FARMLAND IF IRRIGATED AND RECLAIMED [B]	PRIME FARMLAND IF IRRIGATED AND NO FLOODING [C]	WILLIAMSON ACT LANDS
Quartzsite Zone							
p-07	0.0	0.0	0.0	0.0	0.0	0.0	0.0
p-08	0.0	0.0	0.0	0.0	0.0	0.0	0.0
i-05	0.0	0.0	0.0	0.0	0.0	0.0	0.0
qn-01	0.0	0.0	0.0	0.0	0.0	0.0	0.0
qn-02	0.0	0.0	282.7	0.0	0.0	0.0	0.0
qs-01	0.0	0.0	94.5	0.0	0.0	0.0	0.0
qs-02	0.0	0.0	231.4	0.0	0.0	0.0	0.0
x-05	0.0	0.0	0.0	0.0	0.0	0.0	0.0
x-06	0.0	0.0	0.0	0.0	0.0	0.0	0.0
x-07	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Copper Bottom Zone							
p-09	0.0	0.0	0.0	0.0	0.0	0.0	0.0
p-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
p-11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
p-12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
p-13	0.0	0.0	507.6	0.0	0.0	0.0	0.0
p-14	0.0	0.0	454.6	0.0	0.0	0.0	0.0
cb-01	0.0	0.0	0.0	0.0	0.0	0.0	0.0
cb-02	0.0	0.0	0.0	0.0	0.0	0.0	0.0
cb-03	0.0	0.0	0.0	0.0	0.0	0.0	0.0
cb-04	0.0	0.0	0.0	0.0	0.0	0.0	0.0
cb-05	0.0	0.0	405.5	0.0	0.0	0.0	0.0

SEGMENT LABEL	FARMLAND OF STATEWIDE IMPORTANCE	FARMLAND OF UNIQUE IMPORTANCE	NOT PRIME FARMLAND [A]	PRIME FARMLAND IF IRRIGATED	PRIME FARMLAND IF IRRIGATED AND RECLAIMED [B]	PRIME FARMLAND IF IRRIGATED AND NO FLOODING [C]	WILLIAMSON ACT LANDS
cb-06	0.0	0.0	0.0	0.0	0.0	0.0	0.0
i-06	0.0	0.0	0.0	0.0	0.0	0.0	0.0
i-07	0.0	0.0	1,269.8	0.0	0.0	0.0	0.0
x-08	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Colorado River and California Zone							
p-15e	19.8	0.0	1,317.4	14.6	16.0	0.0	0.0
p-15w	1,332.7	0.0	163.1	1,142.0	566.0	0.0	658.8
p-16	706.0	0.0	63.1	1,039.1	490.0	0.0	604.1
p-17	291.4	0.0	140.9	410.4	361.0	0.0	0.0
p-18	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ca-01	1,537.2	0.0	13.4	664.1	999.4	0.0	809.3
ca-02	614.7	0.0	88.0	652.5	353.2	0.0	607.4
ca-04	33.1	0.0	66.2	241.4	48.3	0.0	0.0
ca-05	1,301.6	0.0	9.8	974.3	908.4	0.0	299.6
ca-06	335.9	0.0	93.8	646.4	206.7	0.0	335.9
ca-07	0.0	0.0	0.0	1,391.2	250.4	0.0	0.0
ca-09	0.0	0.0	16.3	348.3	12.1	0.0	0.0
cb-10	0.0	0.0	857.6	47.5	0.0	0.0	0.0
i-08s	0.0	0.0	372.2	7.1	237.6	0.0	0.0
x-09	74.5	0.0	0.0	144.4	35.5	0.0	0.0
x-10	79.4	0.0	0.0	509.7	83.5	0.0	0.0
x-11	224.3	0.0	94.6	460.9	222.8	0.0	0.0
x-12	252.6	0.0	6.5	200.4	232.3	0.0	549.7

SEGMENT LABEL	FARMLAND OF STATEWIDE IMPORTANCE	FARMLAND OF UNIQUE IMPORTANCE	NOT PRIME FARMLAND [A]	PRIME FARMLAND IF IRRIGATED	PRIME FARMLAND IF IRRIGATED AND RECLAIMED [B]	PRIME FARMLAND IF IRRIGATED AND NO FLOODING [C]	WILLIAMSON ACT LANDS
x-13	337.8	0.0	5.8	438.7	250.3	0.0	369.8
x-15	0.0	0.0	66.0	750.8	0.0	0.0	0.0
x-16	0.0	0.0	0.0	1,039.1	47.0	0.0	0.0
x-19	0.0	0.0	0.0	0.0	0.0	0.0	0.0

a Category definition = lands that are identified as agricultural, but not as prime or important farmlands

b Category definition = prime farmland if irrigated and reclaimed of excess salts and sodium

c Category definition = prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

d Project total does not equal total Project acreage, as the buffers around segments overlap at the ends of each segment.

Sources: DOC 2016, NRCS 2016b

Commercial and Industrial

Commercial land uses are typically assigned to areas that are used or planned for general commerce. When developed, these areas have more traffic, lighting, and activity than residential areas. Industrial land uses are typically assigned to areas used or planned for uses such as manufacturing, processing raw materials, and chemical handling. These areas may experience greater volumes of heavy equipment and have more lighting, noise, and other characteristics that affect air and water than commercial areas. Approximately 621 acres in the land use study area are classified as commercial (less than 1 percent of the total) and 995 acres of land are classified as industrial (also less than 1 percent of the total) (HDR 2017d).

Industrial land use in the study area includes several existing and approved, but not yet constructed, solar energy facilities. Approved but not yet constructed solar energy facilities include those facilities for which a BLM ROD has been issued. Within the land use study area, these occur in California near Blythe. Solar energy facilities can include on-site access roads, solar panel array(s), on-site substations, power lines, and outbuildings.

Recreation

Recreation is a common land use designation in the land use study area. Recreation is discussed specifically in Section 3.10.

Military Installations

The military land use study area overlaps the YPG, which is the only military installation in the military land use study area. The YPG is a center for testing military equipment including vehicles, unmanned aerial systems, air delivery, electronic warfare, artillery, rockets, and other weapon systems. Testing on the YPG consists of both developmental testing for new equipment and operational testing to prepare equipment for fielding by military units. The Army's Free Fall School is also located on the YPG.

Land use within the YPG is not entirely restricted to military equipment and artillery testing; different regions within the YPG are used for different purposes (YPG 2017). General Motors operates a test track on the YPG under an Enhanced Use Lease. Where compatible with the military mission, for example, in coordination with the AGFD, the YPG also administers public access for hunting in certain parts of the installation by permit (Section 3.10).

At elevations below 10,000 feet in Class B airspace (airspace from surface to 7,000 feet above ground level or up to 12,500 feet surrounding busy airports), aircraft normally are required to operate at speeds less than 250 knots. Military training routes (MTRs) are aerial corridors across the US in which military aircraft can operate below 10,000 feet at faster speeds. The presence of MTRs in the Project Area does not preclude particular land uses on the ground; rather, the relevant planning document specifies the appropriate or designated land uses (Section 3.17).

Open Land

Based on the standard land use classification systems that are often used in city and county plans, much of the land in the land use study area would typically be classified as open space or vacant land. However, these lands are managed by the BLM and the USFWS under their own land use plans, which contain agency-specific management designations. These land use allocations or designations are discussed in Section 3.8.3.15, as they apply to specific proposed or Alternative Segments. While much of the lands classified as open space in the land use study area are under the jurisdiction of the BLM or the USFWS, 2,023 acres of land that are privately owned are classified as open space, amounting to 1 percent of the total area within the land use study area (HDR 2017d).

Colorado River Indian Tribes Land

The CRIT reservation lies along the Colorado River; a portion of the reservation is west of the river in California, but the majority of the reservation lies east of the river in Arizona (Appendix 1, Figure 1.1-1).

The land use study areas for both the Proposed and Alternative segments in Copper Bottom Zone area include the southeastern tip of the CRIT reservation. The southern end of the reservation is a heavily mountainous area, through which I-10 passes. There are few other formal roads, and there is little to no current settlement. The area has historically been used for gravel extraction and mining under the management of the CRIT.

Public Facilities

Public facilities, such as schools, wastewater treatment plants, and landfills, are addressed differently within each of the relevant land use plans for the Project Area. These facilities typically are managed either by the city or the county within which they reside and most are located in the vicinity of populated areas. Approximately 340 acres within the land use study area are classified as local, open water, or public/semi-public, amounting to less than 1 percent of the total area within the land use study area (HDR 2017d). Lands classified as local and open water are included in the public facilities category, as these lands are typically owned and/or managed by the local municipality.

Utilities

The Energy Policy Act of 2005, Section 368 mandated the designation of energy corridors for oil, gas, and hydrogen pipelines, and electricity transmission and distribution facilities (Section 3.8.1.1). In 2009, the BLM and the USFS designated 6,000 miles as WWECs. The corridors also contain highways and the CAP canal in places. While the corridors are designated for use by utilities, their classification as utility corridors does not preclude other uses. For example, some of the land is also classified as Open Space or as areas that may be used for recreation.

A variety of existing utilities are present in the land use study area, including water, oil, natural gas pipelines and smaller distribution lines; underground and aboveground electricity transmission lines; and buried fiber optic cables. These utilities may or may not be present in designated corridors. Utilities that occur on BLM land are generally authorized under a ROW grant.

Rights-of-Way and Other Land Uses

Additional land uses were identified through review of the BLM's LR2000 database, including various ROWs for Federal and state roadways, transmission lines, and pipelines; oil, gas, and mining leases; and other permits, leases, and easements (HDR 2017d). Additional information regarding mineral leases is provided in HDR (2017b). Air transportation facilities are discussed in Section 3.17.

3.8.3.3 Zone-Specific Conditions

East Plains and Kofa Zone

Within the East Plains and Kofa Zone land use study areas, the majority of the land is Federal and the land use is not classified; however, where classified the most common land use classification is residential (13%) (Appendix 1, Figure 3.8-1). Agriculture is also present in this area, though the land use classifications may not indicate as such. The majority of agriculture in this area occurs in the Harquahala Valley, and some is classified by the NRCS as prime farmland, if irrigated.

The entirety of the Proposed Action, where it crosses BLM-administered land, is within designated utility corridors. The majority of the Alternative segments, where they cross BLM-administered land, are within designated utility corridors. No military or tribal lands are within the East Plains and Kofa Zone land use study areas.

Land Use

Proposed Action Segments p-01 through p-06

Most of Proposed Action Segment p-01 is within Maricopa County, Arizona. The Maricopa County Comprehensive Plan does not classify lands at the eastern end of the land use study area where Segment p-01 lies; they are considered "Other: Maricopa County Unincorporated lands" and are discussed and classified under the Tonopah/Arlington Area Plan. North of the Delaney Substation and west of a crossing of Salome Road, Segment p-01 passes through a mix of private residential and state trust land.

Across the county line in La Paz County, the Proposed Action route segments (the western end of Segments p-01 through p-06) principally are on Federal lands managed by the BLM and the USFWS. Segment p-06 crosses Kofa NWR for about 24 miles, crossing about 2 miles south of the northern boundary of the refuge and adjacent to the DPV1 ROW. With the exception of this portion of Segment p-06, the land use study areas for Proposed Action Segments p-02 through p-06 are mostly within a designated utility corridor on BLM-administered land.

Alternative Segments d-01, i-01 through i-04, in-01, and x-01 through x-04

Alternative Segment d-01 is in Maricopa County, Arizona. The Maricopa County Comprehensive Plan does not classify lands at the eastern end of the land use study area where Segment d-01 lies; they are designated as "Other: Maricopa County Unincorporated lands" and are discussed and classified under the Tonopah/Arlington Area Plan. Lands associated with alternative Segment d-01 near the Delaney Substation are classified as residential, open space, and industrial.

As Segment d-01 jogs to the northwest it enters BLM-administered land. Only a small portion of Segment d-01 crosses BLM-administered land. Alternative Segment d-01 crosses the YFO planning area, within which the segment is adjacent to the DPV1 ROW and within the YFO RMP-designated El Paso Natural Gas utility corridor. No designations precluding transmission development are identified.

Across the county line in La Paz County, Alternative segments associated with the I-10 corridor (i-01 through i-04 and in-01) cross private residential and mixed land uses. These segments also cross substantial areas of state trust land. Alternative Segments i-01 through i-04 and in-01, where they cross BLM-administered land, are within the designated I-10 utility corridor. The I-10 utility corridor is partially concurrent with WWEC 30-52; therefore, a portion of Alternative Segments i-02 through i-04 overlap with WWEC 30-52. This corridor is discontinuous because the land in this area is a patchwork of Federal, state trust, and private land. The alternative SCS 12kV distribution line corridor is on BLM-administered land that is not classified and contains no agricultural or residential land.

Alternative Segments x-01 and x-02 cross substantial blocks of state trust land. Alternative Segments x-03 and x-04 are almost entirely on BLM-administered land, except where Segment x-04 crosses a tract of state trust land. Segments x-01 through x-04 are not within designated energy corridors.

Residential

Proposed Action Segments p-01 through p-06

The amount of developed residential acreage and the number of residential parcels associated with the land use study areas of Proposed Action Segments p-01 through p-06 are provided in Table 3.8-3. Proposed Segments p-01 and p-02 are the only Proposed segments in the East Plains and Kofa Zone that contain residential land. None of the Proposed Action segments cross a proposed or approved, but not yet constructed, residential subdivision.

Table 3.8-3 Residential Parcels, East Plains and Kofa Zone Proposed Segments

SEGMENT	RESIDENTIAL ACRES	RESIDENTIAL PARCELS (#)
p-01	453.8	13
p-02	381.0	13
p-03	0.0	0
p-04	0.0	0
p-05	0.0	0
p-06	0.0	0
TOTAL	834.8	26

Alternative Segments d-01, i-01 through i-04, in-01, and x-01 through x-04

The amount of developed residential acreage and the number of developed residential parcels associated with the land use study areas of Alternative Segments d-01, i-01 through i-04, in-01, and x-01 through x-04 are provided in Table 3.8-4. Alternative Segment i-03 contained the greatest amount of residential land, followed by Segment i-01. None of the Alternative Segments (Segments d-01, i-01 through i-04, in-01, and x-01 through x-04) cross a proposed or approved, but not yet constructed, residential subdivision.

Table 3.8-4 Residential Parcels, East Plains and Kofa Zone Alternative Segments

SEGMENT	RESIDENTIAL ACRES	RESIDENTIAL PARCELS (#)
d-01	55.4	1
i-01	862.2	10
i-02	0.0	0
i-03	1,016.5	19
i-04	0.0	0
in-01	0.0	0
x-01	26.8	1
x-02	110.9	2
x-03	0.0	0
x-04	61.4	2
TOTAL	2,133.2	35

Agriculture

Proposed Action Segments p-01 through p-06

The land use study areas for the proposed segments in the East Plains and Kofa Zone contain 13,797 acres of agricultural land, all within Segments p-01 through p-03. Approximately 136 acres of this is classified as prime farmland; the remainder is not prime farmland. There is no farmland of statewide or unique importance within the Proposed Action segments in the East Plains and Kofa Zone, and none of these segments cross center-pivot irrigated fields.

Alternative Segments d-01, i-01 through i-04, in-01, and x-01 through x-04

The land use study areas for the Alternative Segments in the East Plains and Kofa Zone contain 23,454 acres of agricultural land, all within Segments d-01, i-01, i-03, x-01, and x-02. Alternative Segment d-01 includes 4,772 acres of prime farmland and 426 acres of farmland of unique importance; the remainder of the agricultural land in the zone is not classified as prime farmland There is no farmland of statewide importance in the East Plains and Kofa Zone, and none of the Alternative Segments cross center-pivot irrigated fields.

Quartzsite Zone

Within the Quartzsite Zone land use study areas, the majority of the land is Federal and the land use is not classified (Appendix 1, Figure 3.8-2). The majority of the land use study area within the Quartzsite Zone is managed by the BLM; however, some of the Alternative Segments cross land within the Town of Quartzsite.

The entirety of the Proposed Action, where it crosses BLM-administered land, is within designated utility corridors. The majority of the Alternative Segments, where they cross BLM-administered land, are within designated utility corridors.

Very little agriculture is present in the Quartzsite Zone land use study areas. In addition, very little state-owned land is present and of the state trust land in this area, little is leased for agricultural use. No tribal lands are within the Quartzsite Zone land use study areas.

Land Use

<u>*Proposed Action Segments p-07 and p-08*</u>

The Proposed Action route segments pass approximately 6 miles south of the Town of Quartzsite town boundary, outside of the planning boundary. Proposed Segments p-07 and p-08 parallel the existing DPV1/El Paso Natural Gas ROWs, which are both within a designed utility corridor.

<u>*Alternative Segments i-05, qn-01 and qn-02, qs-01 and qs-02, and x-05, x-06, and x-07*</u>

Across the county line in La Paz County, Alternative Segment i-05 associated with the I-10 corridor crosses private residential and mixed land uses, as well as areas of state trust land. Alternative Segment i-05 where it crosses BLM-administered land, is within the designated I-10 utility corridor. The I-10 utility corridor is partially concurrent with WWEC 30-52; therefore, a portion of Alternative Segment i-05 overlaps with WWEC 30-52. This corridor is discontinuous because the land in this area is a patchwork of Federal, state trust, and private land.

Alternative Segments qn-01, qn-02, qs-01, and qs-02 pass through the Quartzsite incorporated boundaries north and south of the most developed part of town, rejoining the Interstate (i-) segments west of town near Dome Rock Road West. The land use study areas for these segments cross lands classified in the Town of Quartzsite General Plan and the La Paz County Comprehensive Plan as industrial, commercial, mixed use, public/semi-public, and residential.

The qn- segments remain principally on BLM-administered land within the Quartzsite town limits. These segments also run adjacent to the northern boundary of lands classified in the Town of Quartzsite General Plan as residential; however, these areas are not currently developed. The qn-segments parallel an existing 116-kV transmission line through this area and Alternative Segment qn-02 crosses a Town of Quartzsite General Plan Tier III growth area, which is slated for development and town growth in the year 2035 and beyond. All of the land use study area for Alternative Segment qn-01 and a small portion of the land use study area for Segment qn-02 in north-central Quartzsite lie within designated utility corridors, respectively.

At the south edge of Quartzsite, the land is already partially or fully developed. At the southwest edge of Quartzsite, Alternative Segment qs-02 passes through a parcel classified as industrial that is not currently developed. Segment qs-01 runs parallel to an existing transmission line. Segments qs-01 and qs-02 are within designated utility corridors

Alternative Segment x-05 is on BLM-administered land. Segment x-05 is not within a designated energy corridor. Alternative Segment x-06 is at the eastern edge of town, and Alternative Segment x-07 runs along Central Boulevard/SR 95, crossing BLM-administered land. The majority of Segment x-06 does not lie within a designated utility corridor. All of Segment x-07 is within a designated utility corridor.

Residential

Proposed Action Segments p-07 and p-08

There is no developed residential land in the land use study areas for Proposed Action Segments p-07 and p-08. None of the Proposed Action segments in the Quartzsite geographic area cross a proposed or approved, but not yet constructed, residential subdivision.

Alternative Segments i-05, qn-01 and qn-02, qs-01 and qs-02, and x-05, x-06 and x-07

The amount of developed residential acreage and the number of residential parcels associated with the land use study areas of Alternative Segments i-05, qn-01 and qn-02, qs-01 and qs-02, and x-05, x-06 and x-07 are provided in Table 3.8-5. Segments qn-02 and qs-02 contain the majority of the residential land. None of the Alternative Segments in the Quartzsite geographic area cross a proposed or approved, but not yet constructed, residential subdivision.

Table 3.8-5 Residential Parcels, Quartzsite Zone Alternative Segments

SEGMENT	RESIDENTIAL ACRES	RESIDENTIAL PARCELS (#)
i-05	0.0	0
qn-01	0.0	0
qn-02	319.3	2
qs-01	89.2	2
qs-02	210.3	9
x-05	0.0	0
x-06	0.0	0
x-07	0.0	0
TOTAL	618.8	13

Agriculture

Proposed Action Segments p-07 and p-08

The land use study areas for Proposed Action Segments p-07 and p-08 do not include any agricultural land, therefore, the study areas for these segments do not include any prime, unique, or important farmlands, nor do they cross center-pivot irrigated fields.

Alternative Segments i-05, qn-01 and qn-02, qs-01 and qs-02, and x-05, x-06 and x-07

The land use study areas for the Alternative Segments in the Quartzsite Zone contain 609 acres of agricultural land, all within Segments qn-02, qs-01, and qs-02. There is no prime farmland, farmland of statewide importance, or unique importance for Alternative Segments in the Quartzsite Zone, and none of the Alternative Segments in this geographic area cross center-pivot irrigated fields.

Copper Bottom Zone

Within the Copper Bottom Zone land use study areas, the majority of the land is Federal and the land use is not classified (Appendix 1, Figure 3.8-3).

The entirety of the Proposed Action route, where it crosses BLM-administered land, is within designated utility corridors. The majority of the Alternative Segments, where they cross BLM or Reclamation land, are within designated utility corridors.

The Proposed Action route segments cross the northeast corner of the YPG. Portions of the land use study areas for Proposed Action Segment p-11 and Alternative Segments cb-03, i-06, i-07, and x-08 also overlap with the CRIT reservation.

Land Use

Proposed Action Segments p-09 through p-14

The land use study areas for Proposed Action Segments p-9 through p-14 are almost entirely on BLM-administered land. The land use study area for Segment p-09 includes the northeast corner of the YPG. The land use study area for Segment p-11 overlaps a portion of the CRIT reservation. The land use study areas for Segment p-12 crosses Reclamation land.

Where these segments are on Federal land, they also overlap with designated utility corridors. Segments p-10 and p-11 are within the DPV1/El Paso Natural Gas corridor, and Segment p-11 also lies within WWEC 30-52. Segments p-12 through p-14 all fall within the DPV1 corridor, and the easternmost portion of Segment p-12 overlaps with WWEC 30-52.

Alternative Segments cb-01 through cb-06, i-06, i-07, and x-08

Segments cb-01 through cb-06 cross mostly BLM-administered land. The land use study areas for Segments cb-04, cb-05, and cb-06 overlap with Reclamation land. Alternative Segment cb-03 crosses the far southeast corner of the CRIT reservation. The ends of some of the segments fall within designated utility corridors, but the majority of the cb- Alternative Segments do not fall within a designated utility corridor.

Segments i-06 and i-07 east of the Arizona/California state border cross a mix of land use types and jurisdictions. The eastern half of the land use study area for Segment i-06 crosses BLM-administered land, and its western half crosses the CRIT reservation and some state trust land inholdings within the reservation. The land use study area for Segment i-07 crosses mostly Reclamation land, but also some state trust land and privately-owned land classified by the La Paz County Comprehensive Plan as Mixed Use. The majority of the i- segments in this area lie within designated utility corridors.

The land use study area for Alternative Segment x-08 is mostly on BLM and Reclamation land; however, the easternmost portion of the study area for this segment overlaps the CRIT reservation. The northern portion of the study area for Segment x-08 lies within the WWEC 30-52 while the southern portion of the study area overlaps with both WWEC 30-52 and the DPV1 corridor.

Residential

<u>Proposed Action Segments p-09 through p-14</u>

Only the land use study area for Proposed Segment p-10 contains developed residential land. There are two parcels zoned as residential, amounting to a total of 73 acres. None of the Proposed Action segments in the Copper Bottom Zone cross a proposed or approved, but not yet constructed, residential subdivision.

<u>Alternative Segments cb-01 through cb-06, i-06, i-07, and x-08</u>

The amount of developed residential acreage and the number of residential parcels associated with the land use study areas of Alternative Segments cb-01 through cb-06, i-06, i-07, and x-08 are provided in Table 3.8-6. None of the Alternative Segments in the Copper Bottom Zone cross a proposed or approved, but not yet constructed, residential subdivision.

Table 3.8-6 Residential Parcels, Copper Bottom Zone Alternative Segments

SEGMENT	RESIDENTIAL ACRES	RESIDENTIAL PARCELS (#)
cb-01	0.0	0
cb-02	0.0	0
cb-03	0.0	0
cb-04	0.0	0
cb-05	0.0	0
cb-06	0.0	0
i-06	0.0	0
i-07	40.0	5
x-08	0.0	0
TOTAL	40.0	5

Agriculture

<u>Proposed Action Segments p-09 through p-14</u>

The land use study areas for proposed segments in the Copper Bottom Zone contain 962 acres of agricultural land; the land use study areas for Proposed Action Segments p-09 through p-12 do not contain any agricultural land. No farmland of statewide or unique importance is present in the land use study areas for proposed segments in the Copper Bottom Zone, and none of the Proposed Action route segments cross center-pivot irrigated fields.

<u>Alternative Segments cb-01 through cb-06, i-06, i-07, and x-08</u>

The land use study areas for Alternative Segments in the Copper Bottom Zone contain 4,115 acres of agricultural land; however, the land use study areas for Alternative Segments cb-01 through cb-

04, cb-06, i-06, and x-08 do not contain any agricultural land. There is no farmland of statewide or unique importance present in the land use study areas for Alternative Segments in the Copper Bottom Zone, and. none of the Alternative Segments cross center-pivot irrigated fields.

Military Installations
The military land use study area for Proposed Action Segment p-09 includes the northeast corner of the YPG.

The military land use study area for Alternative Segment cb-05 includes the YPG. Alternative Segment cb-05 is approximately 1,250 feet from the northern border of the YPG at its closest point.

CRIT Lands

Proposed Action Segments p-10 through p-15e

Proposed Segment p-11 includes 325 acres of the very southeast tip of the reservation.

Alternative Segments cb-01 through cb-06, i-06, i-07, and x-08

Alternative Segments cb-03, i-06, i-07, and x-08 include 687 acres, 794 acres, 11 acres, and 85 acres, respectively, of the CRIT reservation.

Colorado River and California Zone

The majority of the land within the land use study area for the Colorado River and California Zone is classified as agricultural (Appendix 1, Figure 3.8-4). As the majority of the Proposed and Alternative Segments are on privately owned land, they do not coincide with designated utility corridors. However, portions of Alternative Segments ca-07, ca-09, and x-19 overlap with WWEC 30-52 west of Blythe. In addition, the Proposed Action segments are parallel to the existing DPV1 ROW. No military or tribal lands are within the land use study areas in the Colorado River and California Zone.

BLM-administered land in California crossed by the Proposed Action and Alternative segments are classified as a DFA, where activities associated with solar and wind development and operation will be allowed, streamlined, and incentivized (BLM 2016a).

Land Use

Proposed Action Segments p-15e through p-18

The westernmost part of the land use study area for Segment p-15e crosses land submerged by the Colorado River and also crosses Reclamation land. Proposed Action Segments p-15w through p-18 are about 3.5 miles south of the Blythe city limits and fall outside the limits of the City of Blythe General Plan and the Colorado River Corridor Plan. The Proposed Action segments are within the area covered by the Palo Verde Valley Area Plan and the Riverside County General Plan. The Palo Verde area plan indicates a land use concept that is intended to preserve the agricultural character of the Palo Verde Valley. The Proposed Action segments principally cross lands classified as agricultural. The land use study area for Segment p-15w also crosses privately owned land within the community of Ripley classified as residential.

As much of the Proposed segments cross private land, the majority of the land use study areas for the Proposed segments do not lie within designated utility corridors. However, the westernmost portion of the study area for Segment p-16 and the eastern half of the study area for Segment p-17 that are on BLM-administered land overlap with a designated utility corridor. In addition, all of the Proposed Action segments in the Colorado River and California Zone are parallel with the existing DPV1 ROW. Segments p-16, p-17, and p-18 fully or partially cross a DFA (Appendix 1, Figure 3.11-1c).

Alternative Segments ca-01, ca-02, ca-04 through ca-07, ca-09, cb-10, i-08s, x-09 through x-16, and x-19

Like the Proposed Action segments, the Alternative Segments (the ca-, i-, and x- segments) in this area are largely within the area covered by the Palo Verde Valley Area Plan and the Riverside County General Plan. Segments ca-01, ca-02, ca-04, ca-05, and ca-06 primarily cross privately owned land classified as agricultural. The westernmost portion of Segment ca-02 also crosses BLM-administered land. Segments ca-04 and ca-06 cross land classified as residential. Segment ca-04 crosses land adjacent to the Colorado River owned by the city of Blythe. Segment ca-05 crosses land classified as residential and industrial just south of I-10 near the Blythe Regional Wastewater Reclamation Facility. The land use study area for Segment ca-09 cross primarily BLM-administered land, as does the southern portion of the land use study area for Segment ca-07. The northern portion of the study area for Segment ca-07 crosses privately owned land classified as agricultural. The study area for Segment ca-09 crosses privately owned land classified as open space. While much of the study areas for the ca- segments overlaps privately owned land, a portion of the study areas for Segments ca-06, ca-07, and ca-09 overlap with designated utility corridors.

The land use study area for Segment cb-10 crosses Arizona state trust land, BLM-administered land, and land submerged by the Colorado River. The land use study area for Segment i-08s crosses Reclamation lands, state trust lands, land submerged by the Colorado River, and privately owned lands classified as mixed use. While Segment i-08s is not within a designated utility corridor, the northern half of its land use study area overlaps with both the I-10 corridor and WWEC 30-52. Segments ca-02, ca-06, ca-07, ca-09, x-15, x-16, and x-19 fully or partially cross a DFA (Appendix 1, Figure 3.11-1c).

The land use study areas for the x- segments in the area cross both privately owned land and BLM-administered land. The study areas for Segments x-09 through x-13 lie completely on privately owned land classified as agricultural, commercial, and residential. The land use study area for Segments x-15, x-16, and x-19 are primarily within BLM-administered land. The land use study area for Segment x-19 also crosses lands designated as open space. Where the land use study areas for Segments x-15, x-16, and the northern portion of x-19 cross Federal land, they fall within designated utility corridors. These areas for Segment x-19 also overlap with WWEC 30-52.

Although both the Proposed and Alternative segments are mostly within privately owned lands classified as agricultural, many homes, mostly associated with farms, are scattered through this area. The density of homes increases along the routes closer to Blythe.

The Palo Verde Valley Area Plan includes a special policy area in a band along the Colorado River (contiguous with the Colorado River Corridor Plan) (Appendix 1, Figure 3.8-4). The Colorado River policy area promotes “recreation-based tourist purposes” and recognizes “the critical need to incorporate sensitive design," protect views of the river, and "maintain compatibility with wildlife and resource protection values." The land use study area for ca-04, and x-09 through x-11 would fall within this special policy area.

The area plan also identifies a second special policy area shaped in an irregular polygon encircling the Blythe Airport—the Blythe Airport Influence Area. Aviation facilities are discussed in Section 3.17.

Residential

Proposed Action Segments p-15e through p-18

The amount of residential acreage and the number of residential parcels associated with the land use study areas of Proposed Action Segments p-15e through p-18 are provided in Table 3.8-7. The majority of the residential land is associated with Proposed Action Segment p-15w. None of the Proposed Action segments in the Colorado River and California Zone cross a proposed or approved, but not yet constructed, residential subdivision.

Table 3.8-7 Residential Parcels, Colorado River and California Zone Proposed Segments

SEGMENT	RESIDENTIAL ACRES	RESIDENTIAL PARCELS (#)
Arizona		
p-15e	0.0	0
California		
p-15w	758.9	14
p-16	166.7	4
p-17	0.0	0
p-18	0.0	0
TOTAL	925.6	18

Alternative Segments ca-01, ca-02, ca-04 through ca-07, ca-09, cb-10, i-08s, x-09 through x-16, and x-19

The amount of residential acreage and the number of residential parcels associated with the land use study areas of Alternative Segments ca-01, ca-02, ca-04 through ca-07, ca-09, i-08s, x-09 through x-16, and x-19 are provided in Table 3.8-8. None of the Alternative segments in the Colorado River to California Zone cross proposed or approved, but not yet constructed, residential subdivisions.

Table 3.8-8 Residential Parcels, Colorado River and California Zone Alternative Segments

SEGMENT	RESIDENTIAL ACRES	RESIDENTIAL PARCELS (#)
Arizona		
cb-10	0.0	0
i-08s	50.5	1
California		
ca-01	703.7	27
ca-02	162.0	2
ca-04	0.0	0
ca-05	895.2	52
ca-06	215.3	10
ca-07	134.2	5
ca-09	0.0	0
x-09	43.1	2
x-10	32.2	117
x-11	221.0	1
x-12	103.9	5
x-13	42.3	4
x-15	0.0	0
x-16	0.0	0
x-19	0.0	0
TOTAL	2,441.4	224

Agriculture

Proposed Action Segments p-15e through p-18

The land use study areas for the Proposed Action segments in the Colorado River and California Zone contain 8,074 acres of agricultural land (6,706 acres in California). Of this acreage, 2,350 acres are classified as Farmland of Statewide Importance (2,330 acres in California), 4,039 acres are classified as Prime Farmland (4,009 acres in California), and 1,263 acres are classified as Williamson Act lands. None of the Proposed Action segments in the Colorado River and California Zone cross center-pivot irrigated fields.

Alternative Segments ca-01, ca-02, ca-04 through ca-07, ca-09, cb-10, i-08s, x-09 through x-16, and x-19

The land use study areas for the Alternative Segments in the Colorado River and California Zone contain 18,886 acres of agricultural land. Of this acreage, 4,791 acres are classified as Farmland of Statewide Importance, 12,404 acres are classified as Prime Farmland, and 2,972 acres are classified as Williamson Act lands. None of the Alternative segments in the Colorado River and California Zone cross center-pivot irrigated fields.

Industrial
There is one existing solar energy facility in the land use study area: the NRG Blythe solar energy facility. One approved but not yet constructed solar energy facilities will be constructed in the land use study area: the Blythe Mesa Solar Project. Two proposed solar energy facilities, the Desert Quartzite Project and the BrightSource Energy Sonoran West Project (also known as Crimson Solar), are located in the land use study area.

Proposed Action Segments p-15e through p-18

Proposed Action Segment p-18 is adjacent to and crosses a portion of the BrightSource Energy Sonoran West Project.

Alternative Segments ca-01, ca-02, ca-04 through ca-07, ca-09, cb-10, i-08s, x-09 through x-16, and x-19

Alternative Segment ca-07 is adjacent to the existing NRG Blythe solar energy facility. Alternative Segments ca-06, ca-07, and ca-09 are adjacent to and cross the Blythe Mesa Solar Project, and Alternative Segments x-19 and ca-09 cross the BrightSource Energy Sonoran West Project.

3.9 GRAZING AND RANGELAND

The following Federal, state, and local laws, regulations, and standards govern grazing and rangeland in the land use study area.

3.9.1 Applicable Laws, Regulations, Policies, and Plans

3.9.1.1 Taylor Grazing Act

The Taylor Grazing Act was enacted in 1934 and provides for the regulation of grazing of public lands in the lower 48 states. The Act was intended to improve rangeland conditions and regulate the use of grazing on Federal lands.

3.9.1.2 Wild Free-roaming Horses and Burros Act

In 1971, Congress passed the Wild Free-roaming Horses and Burros Act to require the protection, management, and control of wild horses and burros on public land. This Act is primarily upheld by the BLM, as the majority of the wild horses and burros (WHB) in the West are present on BLM-administered land. While the Act provides for the protection of these animals, the BLM also manages the population sizes in established herd management areas (HMAs) to maintain healthy rangeland for other species and to support the BLM's mission to manage land for multiple uses. Under the Act, the BLM maintains an annual inventory of WHB on their land and removes animals, as necessary, from specific areas. The animals that are removed are either sold or adopted if they are in good health.

The 1978 Public Rangelands Improvement Act was passed by Congress to amend the Wild Free-roaming Horses and Burros Act. The intent of the Act is to provide for development and implementation of a rangeland inventory and management program so rangelands managed by the BLM and the USFS can be improved where necessary to support the objectives of the Wild Free-roaming Horses and Burros Act.

3.9.2 Study Area

The grazing and rangeland study area is a 4,000-foot-wide corridor encompassing the Proposed and Alternative segments. The grazing and rangeland study area also encompasses 200-feet on either side of the alternative SCS 12kV distribution line.

3.9.3 Existing Conditions

The BLM's mission is to manage its lands for multiple uses. Under that directive, the BLM manages rangelands on some of its land for the use of wildlife and livestock. The identified rangelands are divided into grazing districts and then into allotments and pastures for management purposes. The BLM issues grazing authorizations (permits, leases, and exchange-of-use agreements) each year for a fee. Grazing districts are specific areas where public lands are administered in accordance with Section 3 of the Taylor Grazing Act. Leases also can be issued and authorize use of public lands outside an established grazing district. Public lands outside grazing district boundaries are administered in accordance with Section 15 of the Taylor Grazing Act. The permits and leases are issued with stipulations, such as limits on forage use and seasons of use. Permits and leases typically cover a 10-year period. While the BLM manages these permits and leases, compatible uses are generally not precluded in the areas leased for grazing, depending on the applicable RMP.

There are five available BLM grazing allotments in the grazing and rangeland study area, all of them in Arizona. The open BLM grazing allotments include: Aguila (AZ-03000), Carter-Herrera (AZ03015), Clem (AZ03017), Crowder-Weisser (AZ03022), and K Lazy B (AZ03047) (Table 3.9-1; Appendix 1, Figure 3.9-1). Table 3.9-1 provides details about the available BLM grazing allotments, including permitted animal unit months (AUMs), livestock type, and livestock number. Four allotments present in the grazing and rangeland study area have been made unavailable by land use planning decisions – Scott (AZ03075), Ehrenberg (AZ03088), Crowder-Weisser (AZ03096 [different from the open AZ03022 noted above]), and Martinez (AZ03097) (BLM 2016i) (HDR 2017d). These allotments are not included in the table below due to their unavailable status and will not be discussed further.

The BLM assesses the conditions of allotments using the Land Health Standards evaluations, which include properly functioning watersheds, maintenance of ecological processes, maintenance of the quality of surface waters, and maintenance of habitats for native plant and animal communities. The assessments allow the BLM to determine whether the allotments are meeting standards and, if an allotment is failing, whether livestock grazing is the cause of failure. The management status for each available allotment is presented in Table 3.9-1. In addition, the table notes which allotments have a management plan and the date of implementation. Each allotment is classified as Improve, Maintain, or Custodial. Allotments classified as Improve are those where grazing management or level of use is, or is expected to be, a significant causal factor in not achieving land health standards or where a change in terms and conditions in the grazing authorization may be necessary. Allotments classified as Maintain are those where land health standards are met or where grazing is not a significant causal factor for not meeting the standards. Allotments classified as Custodial are those where public land produces less than 10 percent of the forage or public lands are less than 10 percent of the total land area within the authorization. Priority is given to allotments with Improve classifications, followed by Maintain. Custodial allotments are lowest on the priority list for range improvements.

Grazing use has been occurring year-round on the Crowder-Weisser and K Lazy B allotments for many years. The Crowder-Weisser and K Lazy B allotments have met all rangeland health standards for upland sites, riparian-wetland sites, and desired resource conditions (PEER 2012). No rangeland health standards data are available for the Aguila, Carter-Herrera, and Clem allotments. No existing access restrictions were noted in the BLM's Rangeland Administration System records. Range improvements were identified through a review of aerial imagery in Google Earth for the active and open BLM grazing allotments, as information on range improvements is not available in the BLM's Rangeland Administration System.

There are also a number of parcels administered by the ASLD and leased for multiple purposes, including grazing or agricultural use, though the majority are leased for grazing. Within the grazing and rangeland study area, Arizona state trust land is leased for either grazing or agriculture – 82 ASLD-leased individual parcels are for grazing, and four ASLD-leased individual parcels are for agricultural use (Appendix 1, Figure 3.9-2). Additional parcels are present in the grazing and rangeland study area, but they are not currently leased (HDR 2017d).

An AUM is defined as the amount of forage needed by one animal unit consuming 26 pounds of dry matter per day for 1 month. An animal unit is one mature cow and her suckling calf. A mature bull is the equivalent of 1.3 animal units, a yearling steer or heifer is 0.67 animal units, and a weaned calf is 0.5 animal units. To determine the number of animals a certain allotment can support, the available dry matter is estimated and then converted to AUMs (Alberta Agriculture and Forestry 2007). Certain conditions can affect the amount of AUMs available for a specific allotment, including drought, flooding, fire, and development. These conditions result in the removal of AUMs from an allotment and, therefore, reduce the number of animals that the allotment can support. Calculating AUMs helps BLM rangeland and pasture managers determine suitable stocking rates for rangelands under a variety of conditions.

Table 3.9-1 Open BLM Grazing Allotments within the Grazing and Rangeland Study Area

ALLOTMENT NUMBER	ALLOTMENT NAME	SIZE (ACRES)	MANAGEMENT STATUS	RANGE IMPROVEMENTS [A]	PERMITTED AUMS	STOCKING RATE (AUMS PER ACRE)	LIVESTOCK TYPE	LIVES TOCK #	PUBLIC LAND (%)
AZ03000	Aguila	207,505	Improve	None	5,073	<0.1	Cattle	427	100
AZ03015	Carter-Herrera	23,091	Improve	None	512	<0.1	Cattle	52	100
AZ03017	Clem	78,992	Custodial	5	4,836	0.1	Cattle	133	100
AZ03022 [b]	Crowder-Weisser	234,645	Maintain [c]	4	15,758	0.1	Cattle	N/A	100
AZ03047	K Lazy B	141,775	Maintain	1	1,861	<0.1	Cattle	165	>99

Source: BLM 2016i

N/A = data not available

[a] Potential features that could be range improvements, based on review of Google Earth imagery from 2015.

[b] Geographic Information System (GIS) data do not match the Allotment Information Report allotment number, which is noted as AZ01933.

[c] Management plan implemented March 1, 2003.

Arizona state trust lands that are leased by the state for grazing and agricultural purposes are available mostly for livestock grazing with limited agricultural use. The state does not maintain a publicly available database containing information on every individual lease; information is made available only for expiring grazing leases. No expiring leases are present in the grazing and rangeland study area in La Paz or Maricopa Counties, therefore, the individual leases within the study area are considered active (ASLD 2016a). However, no additional information is available about the active grazing leases on state trust land (HDR 2017d).

The BLM also manages portions of its land as WHB herd areas and HMAs under the Wild Free-roaming Horses and Burros Act of 1971. Herd areas are geographic areas that were occupied by WHB at the time the Act went into effect. HMAs are those areas established by the BLM for maintaining WHB herds and where the BLM actively manages for WHB. While the intent of the Act is to protect WHB, the BLM also must manage the population levels to promote healthy range conditions to support its multiple use mission, meaning the BLM must remove individual animals annually to control the population level. These animals are typically sold or adopted if they are in good health. The population estimate in the state of Arizona, as of March 1, 2016, was 318 horses and 5,317 burros. In California, the statewide estimate was 4,925 horses and 3,391 burros (BLM 2016j). Of the five BLM field office-planning areas crossed by the Proposed and Alternative segments, three RMPs identify WHB herd areas and HMAs: the Lake Havasu RMP, the YFO RMP, and the NECO Plan. However, only the YFO planning area contains a herd area, or HMA, which overlaps the grazing and rangeland study area, known as the Cibola-Trigo HMA. Within the YFO planning area, this HMA is 179,000 acres and supports both wild horses and burros. The management level the BLM targets for this HMA is 150 wild horses and 165 burros, however, the 2015 populations were estimated to be 240 wild horses and 500 burros (BLM 2015c).

3.9.3.1 Zone-specific Conditions

East Plains and Kofa Zone

Proposed Action Segments p-01 through p-06
The grazing and rangeland study areas for Proposed Action Segments p-01 through p-06 include the following available BLM grazing allotments: AZ03000, Aguila (496 acres); AZ03015, Carter-Herrera (2,499 acres); AZ03017, Clem (12,616 acres); AZ03022, Crowder-Weisser (2,937 acres); and AZ03047, K Lazy B (4,247 acres). The grazing and rangeland study areas for Segments p-01 through p-04 also include 2,915 acres of ASLD-leased grazing lands.

Within the grazing and rangeland study area of Segment p-01, three potential range improvement facilities are present in the Clem grazing allotment. One appears to be an equipment shed with storage tanks, and two appear to be livestock pens associated with additional structures. One potential range improvement is present within the study area for Segment p-06 in the Crowder-Weisser grazing allotment and appears to be a livestock pen with additional structures.

Two livestock and wildlife waters with active permits are present in the study area for Segment p-01: Beacon Tank, permitted by the BLM and Hi-Way Electric Co., and Moore Tank permitted by Hi-Way Electric Co. No range improvements are present on ASLD-leased lands in this geographic area. Additional information on surface water resources can be found in Section 3.19.

Alternative Segments d-01, i-01 through i-04, in-01, and x-01 through x-04
The grazing and rangeland study areas for Alternative Segments d-01, i-01 through i-04, in-01, the alternative SCS 12kV distribution line, and x-01 through x-04 include the following available BLM grazing allotments: AZ03017, Clem (19,902 acres); AZ03022, Crowder-Weisser (23,542 acres); and AZ03047, K Lazy B (11,253 acres).

The grazing and rangeland study areas for Segments d-01, i-01 through i-03, x-01, x-02, and x-04 also include 12,915 acres of ASLD-leased grazing lands and 440 acres of ASLD-leased agricultural lands.

Within the grazing and rangeland study area for Alternative Segment d-01, two potential range improvement facilities are present in the Clem grazing allotment. One appears to be an equipment shed with small livestock pens, and the other appears to be an old livestock pen that may no longer be functioning. Within the grazing and rangeland study area of Segment i-03, four potential range improvement facilities are present. One potential improvement is within the K Lazy B grazing allotment and appears to be an unnamed livestock/wildlife water; however, it is not apparent whether it contains water. Three potential improvements are within the Crowder-Weisser grazing allotment. Two appear to be unnamed livestock/wildlife waters, though it is not apparent whether they contain water, and one appears to be a livestock pen with additional structures.

Three livestock and wildlife waters with active permits are present in the grazing and rangeland study area for Alternative Segments. Gasline Tank, permitted by the BLM and Hi-Way Electric Co., is present along Segment d-01; Dry Corral, permitted by K Lazy B Ranch and Kemper Brown, is present along Segment i-01; and Yuma Tank, permitted by the ASLD and Seven Lakes Co., Inc., is present along Segment x-01. Dry Corral and Yuma Tank are both present on ASLD-leased land.

Quartzsite Zone

Proposed Action Segments p-07 and p-08
The grazing and rangeland study areas for Segments p-07 and p-08 do not include any available BLM grazing allotments or ASLD-leased grazing or agricultural lands.

No available BLM grazing allotments are present in the study area for Proposed Segments p-07 and p-08; therefore, no range improvements were identified. No range improvements are present on ASLD-leased lands.

Alternative Segments i-05, qn-01 and qn-02, qs-01 and qs-02, and x-05, x-06 and x-07
The grazing and rangeland study areas for Alternative Segments i-05, qn-01 and qn-02, qs-01 and qs-02, and x-05, x-06 and x-07 do not include any available BLM grazing allotments or ASLD-leased grazing or agricultural lands.

No range improvements were identified in the study area for Alternative Segments based on Google Earth imagery, and no range improvements are present on ASLD-leased lands.

The westernmost portion of the grazing and rangeland study area for Segment qn-02 includes 781 of acres the Cibola-Trigo herd area.

Copper Bottom Zone

Proposed Action Segments p-09 through p-14
The grazing and rangeland study areas for Proposed Action Segments p-09 through p-14 do not include any available BLM grazing allotments, however, the grazing and rangeland study areas for Segments p-13 contain 2.1 acres of ASLD-leased grazing lands. No range improvements are present. The grazing and rangeland study area for Segment p-09 includes 1,796 acres of both the Cibola-Trigo herd area and HMA. The grazing and rangeland study areas for Segments p-10 through p-14 include 5,911 acres of both the Cibola-Trigo herd area and HMA. In these areas, the BLM manages historic habitat for WHB, and actively manages the herds with a goal of maintaining a healthy ecosystem and allowing for continued population growth over a four- to five-year period.

Alternative Segments cb-01 through cb-06, i-06, i-07, and x-08
The grazing and rangeland study areas for Alternative Segments cb-01 through cb-06, i-06, i-07, i-08s, and x-08 do not include any available BLM grazing allotments. The grazing and rangeland study areas for Segments i-07include 918 acres of ASLD-leased grazing lands.

The study areas for Alternative Segments in the Copper Bottom Zone include 14,490 acres of the Cibola-Trigo HMA.

Colorado River and California Zone

Proposed Action Segments p-15e through p-18
The grazing and rangeland study areas for Proposed Action Segments p-15e through p-18 do not include any available BLM grazing allotments. Only segment p-15e is in Arizona; the grazing and rangeland study areas for Segment p-15e contains 572 acres of ASLD-leased grazing lands and 1,411 acres in the Cibola-Trigo HMA.

No available BLM grazing allotments are present in the study area for Proposed Segments p-15e through p-18; therefore, no range improvements were identified.

Alternative Segments ca-01, ca-02, ca-04 through ca-07, ca-09, cb-10, i-08s, x-09 through x-16, and x-19
The grazing and rangeland study areas for Alternative Segments ca-01, ca-02, ca-04 through ca-07, ca-09, cb-10, i-08s, x-09 through x-16, and x-19, all located in California, do not include any available BLM grazing allotments.

The grazing and rangeland study areas for Segments cb-10 and i-08s, located in Arizona, include 385 acres of ASLD-leased grazing lands and the study area for Segment i-08s also includes 132 acres of ASLD-leased agricultural lands.

3.10 RECREATION

3.10.1 Applicable Laws, Regulations, Policies, and Plans

3.10.1.1 Federal

Recreation and Public Purposes Act

The Recreation and Public Purposes Act, enacted in 1954, is administered by the BLM. The Act authorizes the sale or lease of public lands for recreational or public purposes to state and local governments and to qualified nonprofit organizations. Examples of typical uses on lands subject to the Act are historic monument sites, campgrounds, schools, firehouses, law enforcement facilities, municipal facilities, landfills, hospitals, parks, and fairgrounds.

BLM Manual 8320 – Planning for Recreation and Visitor Services

BLM Manual 8320, developed in 2011, provides recreation and visitor services policy direction to supplement the planning and resource management planning regulations set forth in 43 CFR Part 1600. The BLM's recreation planning process is an outcome-focused management approach that stresses the management of recreation settings to provide opportunities that allow visitors and local communities to achieve a desired set of individual, social, economic, and environmental benefits. Planning for recreation resources focuses on fulfilling the BLM's mission to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

EO 11644 and 11989 (OHV use on Public Lands)

EO 11644, issued in 1972, and EO 11989, issued in 1977, direct Federal agencies to manage motorized vehicle use on public lands and regulations implementing these EOs are codified under 43 CFR 8342.1. Travel management on BLM-administered land consists of establishing a network of roads, primitive roads, and trails, while ensuring resource compliance with standards required by Federal regulations.

EO 13443 (Facilitation of Hunting Heritage and Wildlife Conservation)

EO 13443, issued in 2007, directs Federal agencies with jurisdiction over public land management, outdoor recreation, and wildlife management to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat. EO 13443 requires agencies to evaluate the effect of agency actions on trends in hunting participation, and where appropriate, to address declining trends and implement actions that expand and enhance hunting opportunities for the public. In accordance with EO 13443, Federal agencies are directed to work collaboratively with state governments to manage and conserve game species and their habitats in a manner that respects private property rights and state management authority over wildlife resources.

BLM Resource Management Plans

BLM RMPs provide guidance for the review and provision of certain land use authorizations or allocations, including designated recreation sites.

BLM Hassayampa Field Office

The Hassayampa Field Office has identified three types of recreation designations or allocations for the Bradshaw-Harquahala planning area: 1) SRMAs; 2) recreation management zones (RMZs); and 3) ERMAs. SRMAs are areas of intensive recreation use that are managed to retain recreation opportunities while also protecting other resources and reducing user conflicts. RMZs are planned and delineated areas with designated recreation opportunities, settings, and activities. ERMAs are considered to be all public lands not otherwise allocated as an SRMA or an RMZ. In addition, several WAs are designated within the planning area.

BLM Lower Sonoran Field Office

The Lower Sonoran Field Office has identified both SRMAs and ERMAs within the planning area. The management objectives specified in the RMP indicate that providing quality recreation opportunities and experiences are a focus of the field office, where conflicts with other allocations and authorizations do not occur. Management of WAs are also discussed under this RMP.

BLM Lake Havasu Field Office

The Lake Havasu Field Office has identified SRMAs within the planning area, within which RMZs are identified for site-specific recreational use requiring detailed planning and management. The Lake Havasu RMP also identified six recreation settings or classes and stated that the field office will manage public lands to maintain or meet these prescribed settings within the planning area. These settings include: 1) Primitive, 2) Semi-Primitive, 3) Rural Natural, 4) Rural Developed, 5) Suburban, and 6) Urban. The RMP also discusses management of several WAs.

BLM YFO

The YFO RMP contains management decisions for both special designations and recreation management. The YFO manages seven developed recreation sites that charge amenity recreation fees, including the Ehrenberg Sandbowl site. The RMP also identifies ACECs, SRMAs, RMZs, and ERMAs, as well as LTVAs and WAs.

BLM Palm Springs-South Coast Field Office

The Palm Springs-South Coast Field Office identifies ACECs, SRMAs, and ERMAs in the CDCA Plan of 1980, as amended. The SRMAs total approximately 2.7 million acres within the planning area, for which individual management plans have been prepared. The ERMAs in the planning area amount to just over 900,000 acres.

Kofa National Wildlife Refuge and Wilderness and New Water Mountains Wilderness Interagency Management Plan

The Interagency Management Plan states that the objective is to maintain high-quality opportunities for recreation, including wildlife-dependent and/or primitive recreation that is compatible with the mission of the NWR. These recreational uses could include wildlife observation, hiking, hunting, camping, photography, and solitude. While recreation is allowed on the NWR, these uses are secondary to the primary purposes for which the NWR was established and undergo an annual review. Any new proposed recreational uses must undergo a compatibility analysis and determination.

Yuma Proving Ground Integrated Natural Resources Management Plan

The Yuma Proving Ground Integrated Natural Resources Management Plan states that while there is limited recreational use in authorized areas on the YPG, recreational use is regulated to ensure public safety, protect national security and the mission of the YPG, and preserve natural resources. Certain recreational activities are prohibited, including target shooting, rockhounding, hiking, and recreational OHV travel. Hunting is the primary recreational activity authorized in certain areas of the YPG.

3.10.1.2 State

Arizona

While Arizona state trust land (Section 3.8.1.1) is not public land, many of the areas are open to public use. AAC R12-5 governs uses, permits, and fees for state-owned lands and establishes the recreational permit program. This program requires recreational users to hold a permit or lease for use of state trust land, with the exception of licensed hunters and fishers pursuing game or fish in the appropriate season, and certain archaeological activities permitted by the Arizona State Museum. The ASLD may close some areas to certain recreational activities due to hazardous conditions, dust abatement, or other reasons, and lands leased for agriculture, mining, commercial, or military purposes are closed to recreational use. All three types of recreational permits issued by the ASLD include certain conditions and restrictions with which all users must abide (ASLD 2016b).

Hunting and fishing in Arizona is managed by the AGFD under the authority of the ARS Title 17 and regulated under Arizona Administrative Rules, Title 12. The AGFD publishes annual updates to hunting and fishing regulations that define species and bag limits for mammal and bird hunting and freshwater fishing throughout the state, including on Federal and state trust lands.

California

School trust and sovereign lands administered by the CSLC (Section 3.8.3.1) reserve the right to fish in CSLC waters and the right to convenient access to those waters. State lands managed by the CSLC are considered public lands and under the State of California Constitution, and must be kept available for fishing purposes (CSLC 2016).

Hunting and fishing in California is managed by the CDFW under the authority of the California Fish and Game Code and regulated under CCR Title 14 (Natural Resources). The CDFG publishes annual updates to hunting and fishing regulations that define species and bag limits for mammal and bird hunting, freshwater and ocean fishing, and commercial fishing throughout the state, including on Federal and state lands.

3.10.1.3 Local

Maricopa County

Maricopa County Comprehensive Plan: Vision 2030
Maricopa County's Comprehensive Plan: Vision 2030 (2016) includes the following goals and policies addressing recreation and open space in the county that would apply to the Project:

> Open Space Goal #1: Provide regional leadership to promote environmental quality, including the preservation of open, natural park and recreation lands.
>
> Open Space Goal #4: Have quality neighborhood parks and open space with adequate and appropriate recreation amenities in urban residential development.
>
> Open Space Policy #2: Maricopa County supports dedication and improvement of trail ROW within new development, including the Maricopa Trail and Maricopa County Regional Trail System.

Tonopah/Arlington Area Plan: 2020 Eye to the Future
The Plan does not show any planned parks, trails, or dedicated open space in the recreation study area.

La Paz County

The La Paz County Comprehensive Plan documents the following goals and policies that would apply to the Project:

> Goal 3: Maintain and enhance recreational areas countywide.
>
> Policy 3.10: Work with regional partners to ensure continued access and recreational uses on the Colorado River.
>
> Policy 3.30: Work with the BLM to designate/develop OHV areas in La Paz County.

Town of Quartzsite

While the Town of Quartzsite General Plan (2014) does not list goals and objectives directly related to recreation, it does document that one of the important attributes of Quartzsite is that it is surrounded by vast expanses of open space and public land. It further documents that "there is a healthy mix of full-time residents and winter visitors and all enjoy the many activities, recreational opportunities, and events including the largest Gem and Mineral Show."

Riverside County

Riverside County General Plan
The objectives of the Riverside County General Plan (2017) are to promote focused and balance growth within the county, while minimizing potential adverse impacts to the environment. The Plan includes the following development goals and objectives relevant to recreation and the Project:

> LU 9.1: Provide for permanent preservation of open space lands that contain important natural resources, hazards, water features, watercourses, and scenic and recreational values.
>
> LU 4.1(u): Recognize open space, including hillsides, arroyos, riparian areas, and other natural features as amenities that add community identity, beauty, recreational opportunities, and monetary value to adjacent developed areas.

LU 4.1(v): Manage wild land fire hazards in the design of development proposals located adjacent to natural open space.

City of Blythe

The City of Blythe General Plan 2025 (2007a) documents the rapid growth of tourism in the Blythe area because of the many recreational activities along the Colorado River during the warmer months. The City of Blythe General Plan is amended to include the Colorado River Corridor Plan (City of Blythe 2007b) that specifically addresses the importance of recreation along the river by establishing the following goals and objectives:

> "The City and Community's vision for the plan area includes creating a pattern of development that reinforces the City's small-town feel and location along the Colorado River. The vision includes providing a variety of housing opportunities to establish viable and livable neighborhoods; preserving valuable open space; developing additional recreational and resort land uses; protecting existing agricultural land uses; creating a multi-purpose recreational trail system; providing additional River access points; and, preserving open space while balancing circulation needs" (City of Blythe 2007b, p. 3).

3.10.2 Study Area

The recreation study area is a 2-mile-wide corridor encompassing the Proposed and Alternative segments. However, the area used for the description of the affected environment for recreational resources includes the entirety of recreation areas intersected by the Proposed and Alternative segments, adjacent recreation areas (within 1 mile), and areas that could be directly or indirectly affected by the Project.

3.10.3 Existing Conditions

The study area contains recreation areas under the jurisdiction of various agencies including the BLM, USFWS, and Maricopa, La Paz, and Riverside Counties. In addition, there are some areas in the study area that are closed to or only allow restricted recreation activities, including the YPG.

Recreational activities in the recreation study area include camping, nature viewing, amateur geology (i.e., rockhounding), team sports, water sports, OHV use, hiking and backpacking, rock climbing, and hunting. There is one skydiving provider in the study area located in Blythe, California. Aviation facilities are discussed in Section 3.17. The BLM assesses the number of recreation visitors to certain areas each year. These recorded visitor numbers are maintained by each BLM field office.

3.10.3.1 Recreation Management

Recreation Opportunity Spectrum

The BLM uses a planning tool known as the Recreation Opportunity Spectrum (ROS) to inventory, classify, and map public lands according to their suitability for various types of recreational activity based on the presence of physical setting characteristics. The system defines six classes of recreation opportunity ranging from natural, low-use areas to highly developed, intensive use areas: these include Rural Natural, Rural Developed, Urban, Suburban, and Semi-Primitive. The classes are defined by setting, the types of recreational activities appropriate to that setting, and the types of recreation experience the setting offers to visitors.

- Rural Natural ROS class has prevalent opportunities to experience nature, with occasional human activity or development, and moderate levels of management present and amenities available. Recreational vehicle (RV) camping facilities are typically included in this ROS. Rural Natural areas are accessible with motorized vehicles but experience low use and only moderate management; some modern facilities are present.
- Rural Developed ROS class includes areas along highways and major transmission lines and provides some opportunities to experience nature, but with frequent human activity and development, and day use and weekend use from nearby population centers is common. Rural Developed areas offer low concentrations of users, motorized and non-motorized recreation opportunities, and some convenience facilities, as well as on-site management offering safety and security (BLM 2007). Urban ROS class includes limited opportunities to experience nature and has short-term visitors as well as visitors preparing to visit other ROS areas.
- Suburban ROS class offers limited opportunities to experience nature and has widespread human activity and development. Local residents and long-term visitors learn about the area's natural and cultural history.
- Semi-Primitive ROS class has widespread opportunities to experience nature, with little human activity or development. There may be car and tent camping far from modern facilities, and motorized access may be limited. The Semi-Primitive class offers a primarily natural experience, where moderate outdoor skills are required, and there is very low use, some primitive trails, infrequent motorized vehicles, and only subtle management noticeable.

Special Recreation Management Areas

BLM designates SRMAs to help direct management priorities in areas with a high amount of recreational activity and increased resource values and public concern. Many SRMAs intersect with the recreation study area (Section 3.10.3.3; Appendix 1, Figure 3.10-1).

Special Recreation Permits

BLM issues Special Recreation Permits (SRPs) for commercial and competitive uses, organized group events and activities, and vending operations conducted on public lands. The permits can be for one-time events, such as an OHV race or horse ride, or for on-going commercial uses such as jeep tours. BLM also issues SRPs for LTVA use (Section 3.10.3.3).

3.10.3.2 Recreation Areas

Recreation areas are used by the public for both dispersed and developed recreation. They are generally managed by a Federal, state, or municipal agency. Table 3.10-1 lists the recreation areas within the study area.

Table 3.10-1 Recreation Areas

RECREATION AREA	ROS	VISITOR NUMBERS	DESCRIPTION
Big Horn Mountains WA	Primitive	1,889 people from 2014 to 2015 (BLM 2016k)	The Big Horn Mountains WA is a 21,000-acre WA designated by Congress in 1990 and managed by the BLM's Hassayampa Field Office (BLM 2016l; Wilderness 2016a). Visitors participated in activities such as camping, rock climbing, hiking, hunting big and small game, rockhounding, and nature viewing, along with OHV use in the surrounding areas (BLM 2016k). While no formal trails are established in the Big Horn Mountains WA, there are a number of primitive campsites. The WA attracts recreational users who can access the area by way of unimproved and unmaintained dirt roads located along the northern, eastern, and western boundaries. The primary access point is West Big Horn Road.
Hummingbird Springs WA	Primitive	2,259 people from 2014 to 2015 (BLM 2016k)	The Hummingbird Springs WA is 55 miles west of Phoenix, Arizona, in western Maricopa County and northeast of the Big Horn Mountains WA (BLM 2016l; Wilderness 2016b). The Hummingbird Springs WA is separated from the Big Horn Mountains WA by a route identified in the Bradshaw-Harquahala RMP as a tertiary route; therefore, the two WAs are essentially contiguous. Although it is outside of the recreation study area, it is included due to its proximity to the Big Horn Mountains WA and the potential for visitors to use both WAs during their visit. Visitors participated in activities such as camping, hiking, hunting big and small game, rockhounding, and nature viewing (BLM 2016m). Congress designated this 31,200-acre WA in 1990 and it is managed by the BLM's Hassayampa Field Office (BLM 2016n; Wilderness 2016b). The 3,418-foot-high Sugarloaf Mountain attracts hikers, backpackers, and campers (BLM 2016n). The WA contains many primitive campsites for recreational use (Wilderness 2016b).
Eagletail Mountains WA	Primitive	3,000 people from 2014 to 2015 (BLM 2016m)	The Eagletail Mountains WA is a 97,880-acre WA designated by Congress in 1990 and is managed by the BLM's YFO. Several distinct rock strata and geologic features, such as natural arches, high spires and monoliths, jagged sawtooth ridges, and 6- to 8-mile washes, characterize the WA. These features attract numerous geologists and rockhounders to the Eagletail Mountains WA. Documented visitor activities in the Eagletail Mountains WA include hunting big game (1,200 visitors per year) and OHV use (1,200 visitors per year), as well as camping, hiking, backpacking, horseback riding, and nature viewing (BLM 2016m, 2016o; Wilderness 2016d). The primary access route is Palomas Harquahala Road.

RECREATION AREA	ROS	VISITOR NUMBERS	DESCRIPTION
New Water Mountains WA	Primitive	There are no recent BLM visitor number estimates for this WA (BLM 2016m).	The New Water Mountains WA is a 24,600-acre WA designated by Congress in 1990 and managed by the BLM's YFO. Recreational activities in the New Water Mountains WA include hunting, wildlife viewing, hiking, backpacking, camping, and using dark sky locations for astronomical viewing. Hikers and backpackers access various non-motorized routes in the WA. The presence of desert bighorn sheep and mule deer attracts hunters to this recreational area (Wilderness 2016e). The primary access route is Ramsey Mine Road. The New Water Mountains WA is not within the study area; however, it is included in this report due to its location adjacent to Kofa NWR and the potential for visitors to use both areas during their visit.
Kofa NWR	No designation	65,000 to 83,000 annually (Refuge Annual Performance Plan, USFWS 2016c)	The designated WAs within Kofa NWR are managed by the USFWS under the Kofa National Wildlife Refuge and New Water Mountains Wilderness Interagency Management Plan. The New Water Mountains WA is now managed by the BLM YFO under the YFO RMP, which references the Interagency Management Plan. Recreational activities for these visitors include hunting, camping, rock climbing and rappelling, hiking, wildlife observation, photography, rockhounding, and sightseeing, in addition to environmental education activities (USFWS and BLM 1997). The primary access route is Vicksburg Road, which is also known as Avenue 51 E. Recreational users include winter campers from Quartzsite, hunters (who may also camp), and day users. There are no RV hook-ups or camping infrastructure, but RVs can dry camp within 100 feet of a road for up to 2 weeks and there are camping areas that are frequently in use (Christa Weise, Kofa NWR, personal communication August 12, 2016; USFWS and BLM 1997). Rockhounding is a popular activity and is allowed by hand only in the Crystal Springs area (USFWS and BLM 1997).
Yuma East Undeveloped SRMA	Rural Natural	15,100 people from 2014 to 2015 (BLM 2016m).	The Yuma East Undeveloped SRMA is a 526,000-acre management area that includes the Eagletail Mountains WA. Recreational activities include hunting, camping, hiking, nature viewing, and OHV use. Because the SRMA is a seasonal hunting destination, the primary goal is to preserve wildlife habitat for game. In addition, the study area includes a small area of ROS Primitive, within the Eagletail Mountains WA, discussed below (BLM 2010b). OHV use in the Eagletail Mountains WA is prohibited by the Wilderness Act; therefore, OHV use is limited to the SRMA only, and within the SRMA the entirety of the land is classified as limited OHV use, meaning OHV users can ride on existing roads and trails. The primary access route is the El Paso Natural Gas Company Access Road.

RECREATION AREA	ROS	VISITOR NUMBERS	DESCRIPTION
Plomosa Destination SRMA	Semi-Primitive, Rural Natural, and Rural Developed	15,452 people from 2014 to 2015 (BLM 2016m)	The Plomosa Destination SRMA consists of more than 100,000 acres of natural area northeast of Quartzsite that are managed by the Lake Havasu Field Office. Recreation areas within the Plomosa Destination SRMA include the Parker Dam Road Backcountry Byway, the Bouse Plain, and the Plomosa Mountains. Management objectives include providing a natural and remote experience with limited development. Protection of wildlife, historic structures, and archaeological sites from recreational use impacts is a priority (BLM 2007). Activities include camping (9,278 people), OHV use (13,885), and hiking, walking, and running (3,857) (BLM 2016h). Hunting is one of the primary activities in the Plomosa SRMA (BLM 2007). The primary access route near the recreation study area is Perry Lane.
La Posa Destination SRMA	No designation	190,964 people from 2014 to 2015, (BLM 2016m)	The La Posa Destination SRMA is a 310,300-acre SRMA that includes the La Posa LTVA, the Dripping Springs ACEC, and the New Water Mountains WA. A portion of this SRMA runs between the Kofa NWR and the Yuma Proving Ground. The LTVA is a national and international camping destination (BLM 2010b); the majority of visitors camp in RVs. Activities include hiking, OHV use, rockhounding, and cultural resources and nature viewing. Some areas are closed to OHVs, including the New Water Mountains WA and the Dripping Springs ACEC core area. The SRMA includes both the La Posa LTVA and the Dome Rock Mountain Campground, a 14-day camping area (BLM 2010b). The primary access route is I-10.
Colorado River Corridor Destination SRMA	Rural Natural, Rural Developed, and Semi-Primitive	363,131 people from 2014 to 2015 (BLM 2016m)	The Colorado River Corridor Destination SRMA is 149,000 acres managed by the BLM's YFO. The corridor runs south from I-10 on the eastern side of the Colorado River. Recreation in the area includes water-based activities during the summer and OHV use, hunting, fishing, and camping during the winter. The primary destinations, such as Blythe Intaglios Heritage Resource Management Zone, Ehrenberg-Cibola RMZ, and Hidden Shores RV Village, are not in the study area. The primary access route within the recreation study area is Olive Lake Boulevard.

RECREATION AREA	ROS	VISITOR NUMBERS	DESCRIPTION
Saddle Mountain ACEC	No designation	Not available	The Saddle Mountain SRMA is a 47,500-acre SRMA located south of the Delaney Substation, which is managed by the Lower Sonoran Field Office. The core of the SRMA is a wildlife habitat area, and the SRMA emphasizes non-motorized recreation and enjoyment of the vistas, wildlife, geology, and cultural sites in this area. There are multiple areas with interpretive signage to engage visitors. Camping is also available in the SRMA in existing or designated sites. The Lower Sonoran Field Office aims to avoid utility-scale renewable energy and linear land use actions in the SRMA. The Saddle Mountain SRMA allows primitive camping for up to 14 days and vehicle-based camping must be within 100 feet of roads (BLM 2012a, 2012c). The primary access route within the recreation study area for this SRMA is the West Salome Highway.
Dripping Springs ACEC	Semi-Primitive	6,480 visitors from 2014 to 2015 (BLM 2016m)	The Dripping Springs ACEC is an 11,700-acre area located west of the New Water Mountains WA. The BLM designated the Dripping Springs area as an ACEC in 2010 (BLM 2010b) and it is managed by the BLM's YFO. The Dripping Springs ACEC includes a perennial spring (Dripping Springs), desert bighorn sheep habitat, an important petroglyph site, and the remains of several historic stone structures. The BLM designated a 640-acre area around Dripping Spring as a core area for management purposes. Management of this ACEC includes restricting minerals management activities and ROW facilities in the 640-acre core area and discouraging those activities in the entire Dripping Springs ACEC. The primary access route in the recreation study area is Mitchell Mine Road.
Mule Mountains ACEC	No designation	Not available	The Mule Mountains ACEC is a 4,100-acre park approximately 11 miles southwest of Blythe. The ACEC was designated to protect its archaeological and paleontological sites, including prehistoric trails and petroglyphs, World War II military desert training facilities, and a new site that increased the probability of finding Pleistocene era vertebrate fossils. The primary access route within the recreation study area is Power Line Road.
Dome Rock Mountain Camping Area	Rural Natural and Rural Developed	3,526 visitors from 2015 to 2016 (BLM 2016m)	Dome Rock Mountain Camping Area is a 2,215-acre undeveloped area located 3 miles southwest of Quartzsite. There are no facilities, but this location is popular for RVs during the gem and mineral show in Quartzsite in January and February. Each visitor stays an average of 9 to 13 days (maximum allowed is 14 days) and participates in activities such as hiking, OHV use, and rockhounding (BLM 2016m). The primary access route is I-10.

RECREATION AREA	ROS	VISITOR NUMBERS	DESCRIPTION
Quechan Marina Park	Not applicable	Estimated 5,000 per year (Mallory pers. comm).	Quechan Marina Park is a 24-acre city park and marina located in Blythe, California, along the Colorado River. The use area has a boat launch and a beach area, as well as restrooms. Visitors use the park for events such as music festivals, car shows, as a staging area for car races, or group events such as weddings. Passes are required for entry (Nelson 2016; Mallory Sutterfield, City of Blythe, personal communication August 12, 2016).
Ehrenberg Sandbowl	No applicable	Unknown due to equipment malfunction.	The Ehrenberg Sandbowl is a popular OHV recreation area, located on Reclamation land, east of Blythe and the Colorado River, and south of I-10, in Ehrenberg, Arizona. The Ehrenberg Sandbowl includes approximately 2,000 acres of OHV use area, with sand dunes, picnic areas, and restrooms. Of this, 400 acres are identified as Open to OHV use. Permits are required and available on-site and annual permits are available at BLM's YFO and a nearby campsite (Arizona State Parks 2016).
Goose Flats Wildlife Area	Not applicable	Visitor use data was not available.	The Goose Flats Wildlife Area is 29 acres of open space under the jurisdiction of Riverside County. There are no facilities present at the site. There are multiple channels and backwater sloughs separated by vegetated channel bars, which support migratory waterfowl. There are also issues with illegal dumping, target shooting, and OHV trespassing (Riverside County Regional Parks and Open Space District [RCRPOSD] 2013; Marc Brewer, RCRPOSD, personal communications weeks of August 15 and August 22, 2016). The primary access route is Riviera Drive.
Miller Park	Not applicable	2,000 users during the sports seasons (Mallory pers. comm., RCRPOSD 2013).	Miller Park is an 11-acre city park in Blythe with softball, soccer, and flag football leagues using the space throughout the year. The primary access route is West 14th Avenue.
Jack Marlowe Park	Not applicable	No visitor data were available.	Jack Marlowe Park (also known as Ripley Community Park) is a 5-acre park in unincorporated Riverside County in the town of Ripley, California (Mallory Sutterfield, City of Blythe, personal communication August 12, 2016). The Community Services Division of Riverside County manages the park, which does not collect visitor numbers for the park. Recreation amenities include a basketball court, playground, soccer field, and picnic tables (Michael Franklin, Community Services Division, Riverside County, personal communication August 15, 2016). The primary access route is School Road.

3.10.3.3 Long-term Visitor Areas

LTVAs are specially designated areas on BLM-administered land in California and Arizona. LTVAs provide places for visitors to stay for longer periods of time than are typically spent camping on Federal lands between September and April. A seasonal SRP is required that allows visitors to stay in any of the six LTVAs in California or the two LTVAs in Arizona. However, only one LTVA is located within the recreation study area: The La Posa LTVA.

The La Posa LTVA is a special management area managed by the BLM that was set aside to allow for dispersed camping beyond normal public land length-of-stay requirements. It is approximately 11,400 acres in size and is located just south of Quartzsite. Developed in 1983, the La Posa LTVA provides certain amenities for RVs and some tent campers that have been constructed to manage resource degradation. These amenities allow for longer-stay camping opportunities, while protecting the desert ecosystem from overuse (BLM 2016k). The La Posa LTVA does not have utility hookups, but guests pay for dry camping and the BLM provides trash removal and a central sanitary dump station. The ROS is Suburban, which provides limited opportunities to experience nature and has widespread human activity and development, along with opportunities to learn about the area's cultural and natural history (BLM 2010k).

The BLM keeps visitor numbers for those visiting the La Posa LTVA. The BLM recorded 190,964 visitors in the greater La Posa area from 2014 to 2015, and 144,948 visitors to the LTVA. For this same period, there were 137,948 campers in the La Posa LTVA and the most popular activities were nature study (78,283 people) and nature viewing (52,188) (BLM 2016m). The estimated average length of stay at the La Posa LTVA is 2 weeks, most commonly for the January and February gem shows in Quartzsite. However, a dedicated LTVA community stays for the season from September 15 to April 15. The 7-month-long season permit cost is $180 and there can be upward of 10,000 permits per year (Ronald Morfin, BLM, personal communication August 8, 2016). These long-term visitors may keep their RVs in one spot, move around, come and go, or move between La Posa LTVA and Imperial Dam LTVA with the same seasonal permit. In recent years, the number of season permits has been 5,000 to 6,000 (Ronald Morfin, BLM, personal communication August 18, 2016). The La Posa North LTVA Welcome Center is located within the LTVA, less than 1 mile south of I-10 along SR 95. The primary route access is from SR 95.

3.10.3.4 Hunting

Arizona

The AGFD manages hunting within seven game management units (GMUs) in the recreation study area in Arizona (Appendix 1, Figure 3.10-2). The baseline report (HDR 2017e) contains hunting seasons and success rates by species. Hunting in GMUs is managed for bighorn sheep, mule deer, dove, quail, antelope, javelina, waterfowl, coyote, bobcat, mountain lion, cottontail rabbit, and elk.

California

The CDFW manages hunting in the study area in California within its Inland Desert Region. CDFW has different hunting zones for deer, wild pig, waterfowl, upland game birds, and non-game species (CDFW 2016f). The baseline report (HDR 2017e) provides information regarding hunting seasons and success rates by species, along with the species-specific hunting zones within the Colorado River to California Zone.

3.10.3.5 Off-Highway Vehicles

OHV use is popular in both Arizona and California in the recreation study area. Use is generally classified as "heavy" use in the BLM's route inventory for the study area. OHV activities include day use and multiday overnight trips along historic routes and in remote natural areas, such as the proposed Arizona Peace Trail. The proposed Arizona Peace Trail is a 750-mile OHV loop on city, county, state, and Federal lands crossing Mohave, La Paz, and Yuma Counties. The trail follows existing roads and trails between Bullhead City, Arizona, at the northern end and Yuma on the southern end. The proposed trail project was initiated in 2014 and is supported by 14 different OHV clubs, however, it has not yet been designated by the BLM under a Travel Management Plan. As a newer trail, there is limited available visitation and user information.

The proposed Arizona Peace Trail would cross the Proposed and Alternative segments (Table 3.10-2**)**. Along the proposed Arizona Peace Trail there are many points of interest, such as mines, ghost towns, and monuments.

Table 3.10-2 Proposed Action and Alternative Segment Crossings of the Arizona Peace Trail

DESCRIPTION	SEGMENT	ZONE	# OF APT[1] CROSSINGS[2]
Proposed Action	p-06	East Plains and Kofa	1
Proposed Action	p-11	Copper Bottom	1
Proposed Action	p-12	Copper Bottom	3 or parallel
Proposed Action	p-13	Copper Bottom	5 or parallel
Alternative Segment	cb-02	Copper Bottom	8 or parallel
Alternative Segment	cb-03	Copper Bottom	1
Alternative Segment	cb-05	Copper Bottom	1
Alternative Segment	i-03	East Plains and Kofa	1
Alternative Segment	qn-02	Quartzsite	1
Alternative Segment	qs-01	Quartzsite	1
Alternative Segment	qs-02	Quartzsite	2
Alternative Segment	x-04	East Plains and Kofa	1
Alternative Segment	x-07	Quartzsite	1

[1] APT = Arizona Peace Trail

[2] Multiple "crossings" can indicate a segment runs parallel to the proposed Arizona Peace Trail.

BLM-administered land that are designated as "Open" or "Open to All Uses" provide areas for OHV users to ride off-trail, or cross-country. BLM-administered land that are "Limited to Authorized Use" provide access to existing or designated OHV routes but will limit cross-country or off-trail OHV use. "Closed" areas are not open to OHV use. The BLM does not maintain specific data regarding unauthorized or illegal OHV use of lands. Information provided by the BLM does indicate some problems exist with illegal OHV use. BLM staff and law enforcement have difficulty managing these OHV users due to insufficient staff compared to the large number of OHV users (Personal Communication, Ron Morfin, 8/6/2016).

3.10.3.6 Zone-specific Conditions

East Plains and Kofa Zone

Recreation Areas
This subsection describes recreation areas within the recreation study area in the East Plains and Kofa Zone (Table 3.10-3; Appendix 1, Figures 3.10-1 and 3.10-3. Recreation areas are summarized in Section 3.10.3.2).

Table 3.10-3 Recreation Areas, East Plains and Kofa Zone

SEGMENT	RECREATION AREA	DISTANCE TO NEAREST POINT ON TRANSMISSION LINE (MILES)	RECREATION AREA WITHIN STUDY AREA (ACRES)
p-01	Big Horn Mountains WA Saddle Mountain ACEC	<0.1 0.5	1,958 126
p-02	Not applicable	—	—
p-03	Yuma East Undeveloped SRMA	0.3	517
p-04	Yuma East Undeveloped SRMA	0.1	3,677
p-05	Yuma East Undeveloped SRMA	<0.1	2,114
p-06	Kofa National Wildlife Refuge La Posa Destination SRMA Yuma East Undeveloped SRMA	0.0 <0.1 0.1	13,476 1,768 6,519
d-01	Eagletail Mountains WA Yuma East Undeveloped SRMA Saddle Mountain ACEC	0.5 0.1 0.5	165 4,443 330
x-01	Not applicable	—	—
x-02a/b	Yuma East Undeveloped SRMA	0.3	629
x-03	Yuma East Undeveloped SRMA	0.1	954
x-04	Plomosa SRMA La Posa Destination SRMA Yuma East Undeveloped SRMA	0.5 0 0.1	130 13,812 1,150
i-01	Not applicable	—	—
i-02	Not applicable	—	—

SEGMENT	RECREATION AREA	DISTANCE TO NEAREST POINT ON TRANSMISSION LINE (MILES)	RECREATION AREA WITHIN STUDY AREA (ACRES)
i-03	Plomosa SRMA La Posa Destination SRMA	0.5 0	130 7,714
i-04	Plomosa SRMA La Posa Destination SRMA	0.3 0	2,782 11,839
in-01	Plomosa SRMA La Posa Destination SRMA	0 0	5,056 13,194

In addition to the designated recreation areas listed in Table 3.10-3, several RV camping facilities and dispersed camping areas are located in the East Plains and Kofa Zone in the study area. These include the Snowbird West RV Park, Brenda RV Park, and Gold Nugget Road and Ramsey Mine Road dispersed RV camping areas.

The Proposed Action would cross the Kofa NWR (Segment p-06). It would run adjacent to the Big Horn Mountains WA (Segment p-01) and the Yuma East Undeveloped SRMA (Segment p-05), and would be within 0.5 mile of the Saddle Mountain ACEC.

Alternative Segment i-01would cross the Plomosa SRMA, and three other Alternative segments would be within 0.5 mile of the Plomosa SRMA (Segments i-03, i-04, and x-04). The Alternative segments would run adjacent to the Yuma East Undeveloped SRMA (Segment x-03), and would be within 0.5 mile of the Saddle Mountain ACEC (Segment d-01), Eagletail Mountains WA (Segment d-01), and Dripping Springs ACEC (Segment x-05).

<u>Proposed Action Segments p-01 through p-06</u>
The Proposed Action passes adjacent to the Big Horn Mountains WA and through the Kofa NWR. The greatest number of acres within 1 mile of the Proposed Action route is the Kofa NWR, at Segment p-06 (13,476 acres). The Proposed Action route crosses both the Yuma East Undeveloped SRMA and the La Posa Destination SRMA.

<u>Alternative Segments d-01, i-01 through i-04, in-01, x-01 through x-04</u>

The Alternative segments cross the designated areas near the Eagletail Mountains WA, the Plomosa SRMA, the Kofa NWR, and the Dripping Springs ACEC. The Alternative segments in this geographic area cross the Yuma East Undeveloped SRMA, the La Posa Destination SRMA, and the Plomosa SRMA. The alternative SCS 12kV distribution line would run adjacent to the Ramsey Mine Road dispersed camping area.

LTVAs
None of the segments in the East Plains to Kofa Zone would cross or be within 1 mile of the La Posa LTVA.

Hunting

The Proposed and Alternatives segments in the East Plains and Kofa Zone cross six GMUs: GMU 41, 42, 43A, 44A, 45A, and 45B (Appendix 1, Figure 3.10-2; Table 3.10-4). Hunting in these GMUs is managed for bighorn sheep, mule deer, dove, quail, antelope, javelina, waterfowl, mountain lion, cottontail rabbit, and elk.

Table 3.10-4 GMUs, East Plains and Kofa Zone

SEGMENT	GMU NUMBER(S)	SEGMENT LENGTH CROSSING GMU (MILES)
p-01	41	2.7
p-01	42	15.1
p-01	44A	8.5
p-02	41	1.2
p-03	41	2.1
p-04	41	5.5
p-05	41	2.0
p-06	41	10.2
p-06	43A	0.6
p-06	45A	18.7
p-06	45B	6.1
d-01	41	25.2
x-01	41	7.9
x-02	41	6.7
x-03	41	5.6
x-04	41	11.9
x-04	44B	10.7
i-01	41	8.4
i-02	41	3.3
i-03	41	9.8
i-03	44B	10.2
i-04	44B	10.4
in-01	44B	13.8
Alt. SCS Dist. Line	44B	3.1

Source: AGFD (2016c)

Off-highway Vehicles

Table 3.10-5 shows the estimated miles of OHV routes in the East Plains and Kofa Zone within 1 mile of the Proposed Action and Alternative segments for the Lake Havasu and YFO planning areas. This table excludes information from the Lower Sonoran and Hassayampa field offices, as route inventories have not yet been initiated. In addition, the Lake Havasu and a portion of the YFO planning areas do not yet have completed OHV route inventories with designations.

Table 3.10-5 OHV Routes, East Plains to Kofa Zone

SEGMENT	LIMITED TO AUTHORIZED USE ONLY	OPEN	OPEN TO ALL USES	NOT CLASSIFIED	TOTAL (MILES)
p-01	0	0	0	0.5	0.5
p-02	0	0	0	1.5	1.5
p-03	0	0	0	7.2	7.2
p-04	0	0	0	31.3	31.3
p-05	0	0	0	10.8	10.8
p-06	2.2	0	4.5	60.5	67.2
d-01	0	0	0	37.6	37.6
i-01	0	0	0	4.0	4.0
i-02	0	0	0	11.7	11.7
i-03	0.2	2.0	17.8	25.3	45.2
i-04	10.0	1.7	36.0	20.4	68.0
in-01	11.1	4.9	45.8	26.7	88.6
x-01	0	0	0	8.3	8.3
x-02	0	0	0	16.0	16.0
x-03	0	0	0	27.3	27.3
x-04	0.0	0.6	27.5	47.0	75.1

There are no visitor data for the Saddle Mountain ACEC or SRMA (BLM 2016m). Although there are some existing OHV routes in the SRMA, the BLM established the SRMA with an emphasis on non-motorized recreational opportunities. Additionally, the existing routes where the BLM permits OHV use will be assessed for conversion to non-motorized routes, thereby redirecting OHV use away from the SRMA (BLM 2012a, 2012c).

OHV use is prohibited in WAs. However, trailheads that access WAs are also used by OHV users to access areas outside of the WA. The BLM does not collect data on illegal OHV use in WAs from such trailheads. The Eagletail Mountains WA is located south of Segment d-01, in the YFO planning area. The BLM recorded 1,350 OHV users at Eagletail West from 2014 to 2015, a trailhead that also leads to the Eagletail Mountain WA (BLM 2016m). The New Water Mountains WA, also in the YFO planning area, is located between Segments p-06, x-04, and i-04. The BLM recorded 1,501 OHV users for the same period who enter at New Waters West, a trailhead that supports the New Water Mountains WA (BLM 2016m). North of Segment p-01 is the Big Horn

Mountains WA, which is located in the Harquahala-Big Horn area of the Bradshaw-Harquahala planning area. The BLM recorded OHV usage in the greater non-site-specific Harquahala-Big Horn area at 18,961 people from 2014 to 2015. OHV users included people with all-terrain vehicles (ATVs), cars, trucks, sport utility vehicles, and motorcycles (BLM 2016m).

The BLM recorded 1,600 OHV users in the Yuma East SRMA (BLM 2016m). The BLM recorded 13,885 OHV users in the Plomosa SRMA from 2014 to 2015, with users exclusively categorized as ATV users. This SRMA is located north of Segment i-04 in the Lake Havasu planning area (BLM 2016m).

The proposed Arizona Peace Trail is crossed by Proposed Segment p-06 and Alternative Segments i-03 and x-04 (Table 3.10-2; Appendix 1, Figure 3.10-3**)**.

Quartzsite Zone

While Quartzsite has a population of only 3,646 (US Census Bureau 2015), annual visitor use is substantially in excess of that, generally concentrated in the winter months. Visitors are attracted to Quartzsite and its surroundings by the warm weather, desert environment, and community activities such as the gem shows and swap meets held during the winter months. On a list of Quartzsite shows and events for the winter of 2016 to 2017, there were 15 street fairs, swap meets, and gem shows. The town hosts eight major gem and mineral shows with an estimated 2,000 vendors selling rocks, fossils, and gems (Desert USA 2016). During the summer months, the population shrinks back to its permanent population and many activities and services close (BLM 2016p, 2016q). Many winter visitors stay in one of the 25 RV parks, campgrounds, or the La Posa LTVA. More than 100,000 RV campers use this area intensively during the winter.

The specific winter visitor population in and around Quartzsite is unknown because no current census exists for the visitors who arrive in RVs (Mary Hamilton, Parker Area Chamber and Tourism, personal communication June 29, 2016). A 2003 study by Arizona State University documented the estimated number of RVs based on flyovers of the area. The study identified between 250,000 and 1 million visitors to the area during the peak winter season. This tourism is an important part of Quartzsite's economy (Section 3.15).

Recreation Areas

This subsection describes recreation areas within the recreation study area in the Quartzsite Zone (Table 3.10-6; Appendix 1, Figures 3.10-1 and 3.10-4). Recreation areas are summarized in Section 3.10.3.2.

Table 3.10-6 Recreation Areas, Quartzsite Zone

SEGMENT	RECREATION AREA	DISTANCE TO NEAREST POINT ON TRANSMISSION LINE (MILES)	RECREATION AREA WITHIN STUIDY AREA (ACRES)
p-07	Kofa NWR La Posa Destination SRMA	0.6 0	81 4,267
p-08	La Posa Destination SRMA	0	2,868
x-05	Kofa NWR Dripping Springs ACEC	0.6 0.4	69 274
x-06	La Posa LTVA La Posa Destination SRMA	0 0	2,389 13,824
x-07	La Posa LTVA La Posa Destination SRMA	0 0	5,909 11,236
i-05	La Posa Destination SRMA	0	5,657
qn-01	La Posa Destination SRMA	0	2,762
qn-02	Dome Rock LTVA La Posa Destination SRMA	0 0	1,366 14,934
qs-01	La Posa LTVA La Posa Destination SRMA	0 0	1,894 4,953
qs-02	Dome Rock Camping Area La Posa LTVA La Posa Destination SRMA	0 0 0	1,729 1,380 6,960

Proposed Action Segments p-07 and p-08

Proposed Action Segment p-07 is 0.6 mile from Kofa NWR, with 81 acres within 1 mile of the segment. The La Posa SRMA is crossed by both of the Proposed Action segments in this geographic area.

Alternative Segments i-05, qn-01 and qn-02, qs-01 and qs-02, x-05, x-06 and x-07

Every alternative segment in the Quartzsite area passes through the La Posa Destination SRMA and Alternative Segments qs-01, qs-02, x-06, and x-07 are along or within the La Posa LTVA. The segment study area with the largest number of acres overlapping with the La Posa LTVA is Segment x-07 (5,909 acres). Dome Rock Mountain 14-Day Camping Area is located west of Quartzsite. Segments qn-02, qs-02, and i-06 pass through the camping area.

The proposed Arizona Peace Trail is crossed by Alternative Segment qn-02 north of Quartzsite. In addition, while the proposed Arizona Peace Trail is within the La Posa LTVA, it runs along alternative Segment qs-01 for less than 1 mile and is crossed by Alternative Segments x-07 and qs-02.

Hunting
The Proposed and Alternative segments in the Quartzsite Zone cross two GMUs: 43A and 45B (Appendix 1, Figure 3.10-2; Table 3.10-7).

Table 3.10-7 GMUs, Quartzsite Zone

SEGMENT	GMU NUMBER(S)	SEGMENT LENGTH CROSSING GMU (MILES)
p-07	43A	0.9
p-07	44B	1.2
p-08	43A	0.1
P-08	44B	0.6
x-05	43A	0.1
x-05	44B	10.1
x-06	44B	9.2
x-07	43A	0.1
x-07	44B	7.6
i-05	44B	2.9
qn-01	44B	0.6
qn-02	43A	6.3
qn-02	44B	4.5
qs-01	44B	3.1
qs-02	43A	4.8
qs-02	44B	0.1

Source: AGFD (2016c)

Long-term Visitor Areas
The La Posa North LTVA Welcome Center is located less than 1 mile south of I-10 along SR 95. The Proposed Action segments do not cross the La Posa LTVA, but it is crossed by two Alternative Segments (qs-01 and x-07) and is adjacent to Alternative Segment x-06. Segment x-07 has the greatest number of acres within 1 mile (5,909 acres).

Off-Highway Vehicles
Table 3.10-8 shows estimated miles of OHV routes in the Quartzsite Zone within the study area for the Proposed and Alternative segments for the YFO planning area. A portion of the YFO planning area does not yet have a completed OHV route inventory with designations.

Table 3.10-8 Miles of OHV Route in Quartzsite Zone

SEGMENT	LIMITED TO AUTHORIZED USE ONLY	OPEN	OPEN TO ALL USES	NOT CLASSIFIED	TOTAL (MILES)
p-07	5.7	0	9.9	0.5	16.1
p-08	4.0	0	6.9	0	10.9
i-05	5.4	0	16.7	0	22.1
qn-01	0.7	0	7.8	0	8.4
qn-02	3.2	0	55.6	0	58.9
qs-01	0.5	0	13.4	0	13.9
qs-02	1.9	0	32.6	0	34.5
x-05	8.2	0	43.0	0.6	51.8
x-06	4.1	0	28.7	0	32.8
x-07	3.0	0	21.1	0	24.1

The La Posa LTVA, located in the YFO planning area, attracts many OHV users. The BLM recorded more than 30,000 OHV users in the area from 2014 to 2015 (BLM 2016m). OHV users in the La Posa LTVA tend to disperse outward to OHV routes in adjacent areas and, therefore, the La Posa LTVA numbers are representative of the greater area (Ronald Morfin, BLM, personal communication August 8, 2016). The La Posa Travel Management Plan (TMP) (BLM 2016k) indicates a BLM management goal of reducing the proliferation of illegally developed routes, including OHV routes, while also responding to AGFD and BLM resource specialists' concerns about environmental and wildlife habitat degradation. The Plan includes provisions for more well-designed routes and adequate signage and barriers.

Visitor numbers are collected for Dome Rock Road leading to the Dome Rock Camping Area; the BLM recorded 1,763 OHV users in the area from 2014 to 2015 (BLM 2016m).

Copper Bottom Zone

OHV use is one of the most popular recreation activities in the Copper Bottom Zone, and a primary recreation amenity is the proposed Arizona Peace Trail. The portion of the Arizona Peace Trail that passes through Johnson Canyon is particularly popular due to the Canyon's pristine natural qualities and technical challenges. Copper Bottom Pass is another popular OHV area and is valued for its scenic quality and high OHV skill level. The Pass is narrow, scenic, and popular for recreation, with steep rocky terrain, pristine canyons, bighorn sheep habitat, and raptor nests.

Recreation Areas

This subsection describes recreation areas within the recreation study area in the Copper Bottom Zone (Table 3.10-9; Appendix 1, Figures 3.10-1 and 3.10-5). Recreation areas are summarized in Section 3.10.3.2.

Table 3.10-9 Recreation Areas, Copper Bottom Zone

SEGMENT	RECREATION AREA	DISTANCE TO NEAREST POINT ON TRANSMISSION LINE (MILES)	RECREATION AREA WITHIN STUDY AREA (ACRES)
p-09	La Posa Destination SRMA	0	8,978
p-10	La Posa Destination SRMA	0	3,274
p-11	La Posa Destination SRMA Colorado River Corridor Destination SRMA	0 0	2,093 2,564
p-12	Colorado River Corridor Destination SRMA	0	2,715
p-13	Colorado River Corridor Destination SRMA	0	5,954
p-14	Colorado River Corridor Destination SRMA	0	3,046
x-08	Colorado River Destination SRMA	<0.1	725
i-06	Dome Rock LTVA La Posa Destination SRMA Colorado River Corridor Destination SRMA	0 0 0.7	1,695 6,033 38
i-07	Quechan Marina Park Colorado River Corridor Destination SRMA	0.8 0.6	24.1 193
cb-01	La Posa Destination SRMA Colorado River Corridor Destination SRMA	0 0	3,561 2,325
cb-02	La Posa Destination SRMA Colorado River Corridor Destination SRMA	0 0	2,369 2,371
cb-03	La Posa Destination SRMA Colorado River Corridor Destination SRMA	0 0	2,825 1,777
cb-04	Colorado River Corridor Destination SRMA	0	3,656
cb-05	Colorado River Destination SRMA	0	6,093
cb-06	Colorado River Destination SRMA	0	3,288

CRIT lands are located west of Quartzsite and north of Copper Bottom Pass. Within CRIT lands, there is a prohibition on rockhounding or any other resource extraction or damage (CRIT 2012). Segments i-06 and cb-03 cross the CRIT reservation, while Proposed Action Segment p-11 and Alternative Segment cb-03 are within 1 mile of the reservation.

The proposed Arizona Peace Trail runs through the Copper Bottom Zone, including Johnson Canyon. Johnson Canyon is a scenic canyon with a designated, open OHV route (BLM 2016k). Johnson Canyon is an OHV route valued for its scenic and technical attributes, and it is also part of the OHV route open between Quartzsite and the Colorado River. The BLM's route inventory for the YFO planning area indicates that the use level for the Johnson Canyon OHV route is mostly light, with small areas indicated as heavy use. The Proposed and Alternative segments cross the proposed Arizona Peace Trail, including Johnson Canyon, in the Copper Bottom Zone at various points, with the greatest parallel length to Johnson Canyon being with Segment cb-02 (Appendix 1, Figure 3.10-5; Table 3.10-2).

The La Posa Destination SRMA is crossed by Proposed Action Segments p-10 and p-11, as well as almost half of the Alternative Segments. Segments p-13 and i-06 have the greatest number of acres within 1 mile (6,033 and 5,954, respectively).

The Dome Rock Mountain Camping Area is crossed by Segment i-06, with 1,695 acres within 1 mile.

Proposed Action Segments p-09 through p-14

Proposed Action Segments p-09, p-10, and p-11 cross the La Posa Destination SRMA, and Segments p-11 through p-14 cross the Colorado River Destination SRMA.

In addition, Proposed Action Segments p-10 through p-13 run parallel to a portion of the proposed Arizona Peace Trail, just north of the YPG.

Alternative Segments cb-01 through cb-06, i-06, i-07, and x-08

All of the Alternative segments in this geographic area cross the La Posa Destination and Colorado River Destination SRMAs.

Alternative Segment cb-02 runs parallel to a portion of the proposed Arizona Peace Trail and Johnson Canyon, and the trail is crossed by Alternative Segment cb-05.

Hunting

The Proposed and Alternatives segments in the Copper Bottom Zone cross one GMU: 43A. (Appendix 1, Figure 3.10-2; Table 3.10-10).

GMUs in the Copper Bottom Zone include lands within the YPG where legal hunting is permitted (Section 3.10.1.1).

Table 3.10-10 GMUs, Copper Bottom Zone

SEGMENT	GMU NUMBER(S)	SEGMENT LENGTH CROSSING GMU (MILES)
p-09	43A	6.9
p-10	43A	1.1
p-11	43A	4.0
p-12	43A	2.7
p-13	43A	3.5
p-14	43A	0.9
x-08	43A	1.3
i-06	43A	7.1
i-07	43A	6.5
cb-01	43A	3.2
cb-02	43A	2.2
cb-03	43A	4.3
cb-04	43A	1.9
cb-05	43A	4.4
cb-06	43A	1.9

Source: AGFD (2016c)

LTVAs

None of the segments in the Copper Bottom Zone would cross or be within 1 mile of the La Posa LTVA.

Off-Highway Vehicles

Table 3.10-11 shows the estimated miles of OHV routes in the Copper Bottom Zone within the study area for the Proposed and Alternative segments for the YFO and Palm Springs planning areas. A portion of the YFO planning area and the Palm Springs planning area do not yet have completed OHV route inventories and designations.

Table 3.10-11 OHV Routes, Copper Bottom Zone

SEGMENT	LIMITED TO AUTHORIZED USE ONLY	OPEN	OPEN TO ALL USES	NOT CLASSIFIED	TOTAL (MILES)
p-09	7.2	0	26.1	0	33.2
p-10	3.2	0	6.9	0	10.1
p-11	2.8	0	7.1	4.8	14.7
p-12	0	0	0.2	17.9	18.1
p-13	0	0	0	14.5	14.5
p-14	0	0	0	3.1	3.1

SEGMENT	LIMITED TO AUTHORIZED USE ONLY	OPEN	OPEN TO ALL USES	NOT CLASSIFIED	TOTAL (MILES)
cb-01	3.0	0	9.2	2.4	14.6
cb-02	2.0	0	8.6	2.4	13.0
cb-03	2.8	0	6.7	4.9	14.3
cb-04	0	0	3.7	8.6	12.3
cb-05	0	0	0	12.9	12.9
cb-06	0	0	0	16.2	16.2
i-06	4.7	0	27.4	12.7	44.8
i-07	0	0	0	30.9	30.9
x-08	0	0	0.2	13.1	13.3

There are no vehicle visitor data in the Copper Bottom Pass Zone, with the exception of the Colorado River Corridor Destination SRMA (Ronald Morfin, BLM, personal communication August 8, 2016). In the Colorado River Corridor Destination SRMA, which is crossed by the Proposed and Alternative segments in the Copper Bottom Pass Zone, the BLM recorded 1,200 OHV users from 2014 to 2015 (BLM 2016m).

CRIT land west of Quartzsite and north of Copper Bottom Pass are open to OHV users. OHV use is allowed on CRIT lands on existing and established trails and roads. CRIT lands require annual OHV permits and vehicle safety gear. Off-trail, or cross-country, OHV use is limited to tribal races and law enforcement on CRIT lands.

Colorado River and California Zone

The Blythe, California, and Colorado River area is popular with boaters and OHV users, and is a popular winter and summer tourist destination. The YFO manages BLM property in this area and has more than 363,000 visitors per year to the Colorado River Corridor (BLM 2016m). The Palm Springs-South Coast BLM Field Office has more than 492,000 visitors annually to the eastern Riverside County area, which includes this geographic area. Additionally, a skydiving provider (Blythe Skydiving 2017) is located in Blythe.

BLM-administered land in California crossed by the Proposed Action and Alternative Segments are classified as a DFA, where activities associated with solar and wind development and operation will be allowed, streamlined, and incentivized (BLM 2016a). CMAs LUPA-CTTM-1, LUPA-CTTM-2, and LUPA-CTTM-4 would apply to the Project; under the CDCA Plan of 1980, projects must maintain adequate access to and avoid significant impacts on the use and enjoyment of designated recreation areas and facilities (Appendix 2C).

Recreation Areas

This subsection describes recreation areas within the recreation study area in the Colorado River and California Zone (Table 3.10-12; Appendix 1, Figures 3.10-1 and 3.10-6). Recreation areas are summarized in Section 3.10.3.2.

Table 3.10-12 Recreation Areas, Colorado River and California Zone

SEGMENT	RECREATION AREA	DISTANCE TO NEAREST POINT ON TRANSMISSION LINE (MILES)	RECREATION AREA WITHIN STUDY AREA (ACRES)
Arizona			
p-15e	Colorado River Corridor Destination SRMA	0	2,477
cb-10	Colorado River Corridor Destination SRMA	0	2,256
i-08s	Quechan Marina Park Colorado River Corridor Destination SRMA	0.7 0.7	24.1 56
California			
p-15w	Jack Marlowe Park	0.7	5
p-16	Jack Marlowe Park	0.8	5
p-17	Mule Mountains ACEC	0.8	44
p-18	Not applicable	—	—
ca-01	Goose Flats Wildlife Area	0.7	29
ca-02	Not applicable	—	—
ca-04	Not applicable	—	—
ca-05	Not applicable	—	—
ca-06	Not applicable	—	—
ca-07	Not applicable	—	—
ca-09	Not applicable	—	—
x-09	Not applicable	—	—
x-10	Goose Flats Wildlife Area Quechan Marina Park	0.7 1.3	29 0
x-11	Goose Flats Wildlife Area Colorado River Corridor Destination SRMA	0.5 0.5	29 205
x-12	Not applicable	—	—
x-13	Jack Marlowe Park	0.8	5
x-15	Not applicable	—	—
x-16	Not applicable	—	—
x-19	Not applicable	—	—

The Goose Flats Wildlife Area is within 1 mile of Segments ca-01, x-10, and x-11. Several parks are within 1 mile of the Proposed and Alternative segments in the Colorado River and California Zone including Quechan Marina Park (Segment ca-04), Miller Park (Segment ca-05), Jack Marlowe Park (Segments p-15w, p-16 and x-13)

The Mule Mountains ACEC is 0.8 mile from Proposed Action Segment p-17.

The Colorado River Corridor Destination SRMA is 0.5 mile from Alternative Segment x-11.

Proposed Action Segments p-15e through p-18

Jack Marlowe Park is just over 0.7 mile from both Segments p-15w and p-16, with all 5 acres of the park within 1 mile of those segments.

Alternative Segments ca-01, ca-02, ca-04 through ca-07, ca-09, cb-10, i-08s, x-09 through x-16, and x-19

The Goose Flats Wildlife Area is 1 mile from Segments ca-01, x-10, and x-11, with the entirety of the wildlife area located within 1 mile of Segment ca-01.

Hunting
The proposed and alternatives segments in the Colorado River and California Zone cross several hunting zones (Table 3.10-13). The Arizona segments are in GMU 43A. The California segments are in the following hunting zones:

- Deer: D-12
- Wild Pig: Riverside County, Inland Deserts Region
- Waterfowl: Colorado River Zone
- Upland Game Birds: Pheasant – statewide, Quail – Q3, Band tailed pigeon – southern zone, American crow – general
- Nongame: Bobcat – statewide, Raccoon – Imperial County and portions of Riverside and San Bernardino Counties

**Table 3.10-13 Hunting Zones,
Colorado River and California Zone**

SEGMENT	SEGMENT LENGTH CROSSING HUNTING ZONE (MILES)
Arizona	
p-15e	2.8
i-08s	1.3
cb-10	1.8
California	
p-15w	6.6
p-16	4.7
p-17	3.0
p-18	2.4
x-09	0.5
x-10	1.4
x-11	2.1
x-12	1.4
x-13	2.1
x-15	1.7
x-16	2.2
x-19	0.9
ca-01	6.6
ca-02	3.5
ca-04	0.8
ca-05	6.6
ca-06	2.6
ca-07	3.2
ca-09	2.9

Additionally, there is considerable fishing that takes place on the Colorado River, such as at Goose Flats on the California side of the river.

LTVAs
There are no LTVAs located in the Colorado River and California Zone.

Off-Highway Vehicles

There are approximately 59 miles of designated routes in the YFO planning area (Arizona) portion of the Colorado River and California Zone; none of these have been classified with a use designation. In the California portion of the Colorado River and California Zone, the majority of the study area is classified as limited use; therefore, OHV use can only occur on designated roads, primitive roads, or trails. There are approximately 96 miles of OHV routes in the California portion of the zone; the majority of these are classified as trails (Table 3.10-14).

Table 3.10-14 OHV Routes, Colorado River and California Zone

SEGMENT	TRAIL (DIRT)	PRIMITIVE ROAD (MAINTAINED DIRT)	ROAD (PAVED)	NOT CLASSIFIED	TOTAL (MILES)
Arizona					
p-15e	-0	0	0	21.3	21.3
cb-10	0	0	0	15.0	15.0
i-08s	0	0	0	23.1	23.1
California					
p-15w	0	0	2.0	0	2.0
p-16	3.9	4.6	0	0	8.5
p-17	12.8	4.0	0	0	16.8
p-18	6.4	0	0	0	6.4
ca-01	0	0	2.0	0	2.0
ca-02	5.2	2.1	0	0	7.3
ca-05	0	0	2.0	0	2.0
ca-06	2.8	2.3	0	0	5.1
ca-07	12.0	2.1	0	0	14.1
ca-09	3.4	0	0	0	3.4
x-15	6.7	3.4	0	0	10.1
x-16	9.2	6.8	0	0	16
x-19	2.2	0	0	0	2.2
TOTAL	64.6	25.3	6.0	59.4	154.9

3.11 SPECIAL DESIGNATIONS, MANAGEMENT ALLOCATIONS, AND WILDERNESS RESOURCES

3.11.1 Applicable Laws, Regulations, Policies, and Plans

3.11.1.1 Federal

Wilderness Act of 1964 (16 USC §§1131–1136)

The Wilderness Act established the National Wilderness Preservation System and directed Federal land management agencies to review roadless areas of 5,000 or more acres, as well as all roadless islands within National Wildlife Refuge and National Park systems, for potential inclusion in the National Wilderness Preservation System. Further, the Act defines the purposes and uses of WAs, addresses the administration of state and private lands within WAs, and requires annual reporting to Congress on wilderness inventories conducted in compliance with the Act.

Federal Land Policy Management Act of 1976 (43 USC §§1701–1785)

Section 201 of the FLPMA provides for the continuing inventory and identification of public lands, including the delineation of WAs. In compliance with Section 201, the BLM has developed Manual 6310, *Conducting Wilderness Characteristics Inventory on BLM Lands*, issued on March 15, 2012 (BLM 2012d). The Manual provides policy, methods, and guidance for the conduct of wilderness inventories, including specific guidance on WA criteria such as size, naturalness, opportunities for solitude, primitive and unconfined recreation, and supplemental values. BLM parcels of over 5,000 acres (or less if they adjoin a designated WA or Wilderness Study Area [WSA]) that meet these criteria are considered to be lands with wilderness characteristics. While not a special or administrative designation, the BLM can manage to protect lands with wilderness characteristics, minimize impacts to lands with wilderness characteristics, or choose to prioritize other uses while not protecting lands with wilderness characteristics.

BLM- and citizen-provided information regarding WAs and lands with wilderness characteristics in the study area were reviewed. Designated WAs and BLM study areas were described using existing written information; no field examinations of these lands were conducted. For lands with wilderness characteristics, the BLM updated their previous lands with wilderness characteristics inventory within the study area. A stepwise evaluation of the entire study area was conducted using GIS software to determine which lands potentially meet lands with wilderness characteristics criteria, and to specify a subset of these lands for field examination (HDR 2017f). Field efforts conducted for this study complied with BLM Manual 6310 guidance and inventory requirements. Data specified in Manual 6310, Appendix B (Inventory Area Evaluation) are provided in (HDR 2017f).

California Desert Protection Act of 1994 (PL 103-433)

The California Desert Protection Act recognized unique value and resources in desert lands in California and specifically designated certain BLM-administered land as wilderness within the California Desert Conservation Area. Included among these BLM-administered lands were the Big Maria Mountains Wilderness, Chuckwalla Mountains WA, Palen McCoy WA, Rice Valley WA, and Riverside Mountains WA, each managed by the BLM Palm Springs – South Coast Field Office. No lands within the study area were specifically addressed by the Act.

3.11.1.2 State

Arizona Desert Wilderness Act of 1990 (PL 101-628)

The Arizona Desert Wilderness Act recognized unique value and resources in desert lands in Arizona, and specifically designated sections of the Kofa NWR and the New Water Mountains as part of the National Wilderness Preservation System. In Arizona, there are 90 identified WAs designated under this act that total over 4.5 million acres. Five WAs occur within or in proximity to the special designations, management allocations, and wilderness resources study area: Kofa WA; Eagletail Mountains WA; Big Horn Mountains WA; New Water Mountains WA; and Harquahala Mountains WA. A total of 510,900 acres of the Kofa NWR are designated as wilderness, of a total of 665,400 acres in the Kofa NWR as a whole. BLM-administered land included in the Act are Eagletail Mountains WA, Big Horn Mountains WA, and New Water Mountains WA. Eagletail Mountains has 97,880 acres designated as wilderness, New Water Mountains WA has 24,600 acres designated as wilderness, and Big Horn Mountains WA has 21,000 acres designated as wilderness. Both Eagletail Mountains WA and New Water Mountains WA are managed by BLM's YFO. Big Horn Mountains WA and Harquahala Mountains WA are managed by BLM's Hassayampa Field Office.

3.11.2 Study Area

The special designations, management allocations, and wilderness resources study area includes a 4,000-foot-wide corridor encompassing the Proposed and Alternative segments. As land uses and ownership can change with each individual parcel of land regardless of the size of the parcels, a 4,000-foot-wide corridor is sufficient to capture the land uses and jurisdictions that may be affected by the Project. The special designations, management allocations, and wilderness resources study area also encompasses 200-feet on either side of the alternative SCS 12kV distribution line.

3.11.3 Existing Conditions

Specially designated areas are those lands that are managed for specific conservation, preservation, or recreational uses. Specially designated areas are typically public lands managed by a governmental entity, and include WAs, SRMAs, WSAs, ACECs, WHMAs, NCLs, wild and scenic rivers, national conservation areas, national scenic and recreation trails, national scenic and/or backcountry byways, and national monuments. Also, certain state, county, city, and tribal lands—including state parks, wildlife areas, natural areas, state scenic roads, county parks, county important riparian areas, city historic areas, and city parks—are considered specially designated areas (Appendix 1, Figures 3.11-1a through 3.11-c). Management allocations in the study area include DFAs. Lands with wilderness characteristics are not a special or administrative designation but rather a set of criteria for which the lands are managed.

3.11.3.1 Wilderness Areas and Lands with Wilderness Characteristics

Wilderness Areas

There are three designated WAs within the special designations, management allocations, and wilderness resources study area; the New Water Mountains WA is also included due to its proximity to the lands with wilderness characteristics inventory areas analyzed (Appendix 1, Figures 3.11-1a through 3.11-c).

- Big Horn Mountains WA, a 21,000-acre parcel that was designated by Congress in 1990 and is managed by the BLM Hassayampa Field Office.
- Kofa WA, 547,700 acres that were designated by Congress in 1990 and constitutes a majority of lands within the USFWS Kofa NWR. The Kofa WA abuts the DPV1 and El Paso Natural Gas designated energy corridor on both the north and south.
- Eagletail Mountains WA, a 97,880-acre parcel that was designated by Congress in 1990 and is managed by the BLM YFO.
- New Water Mountains WA, a 24,600-acre parcel that was designated by Congress in 1990 and is managed by the BLM YFO. While not directly in the study area, it is adjacent to the Kofa WA and to potential lands with wilderness characteristics.

Lands with Wilderness Characteristics

Lands with wilderness characteristics are generally roadless BLM public land areas greater than 5,000 acres that have maintained their natural character and are primarily undeveloped. Additionally, they provide outstanding opportunities for solitude and for primitive and unconfined recreation. A total of 33 polygons potentially qualifying as lands with wilderness characteristics were identified using existing BLM mapping and inventory efforts, input from BLM staff, citizen-provided data from the Wilderness Society, and GIS analyses. Six of these polygons met the criteria of lands with wilderness characteristics (HDR 2017f) (Appendix 1, Figure 3.11-2). Management actions that apply to lands with wilderness characteristics that are managed to maintain wilderness characteristics in the Yuma RMP (BLM 2010b), include the following:

- Decrease visual effect of existing facilities on naturalness or scenic resources during construction, replacement, and major maintenance (VR-012)
- Allow for emergency purposes the use of motor vehicles and mechanical transport, as well as the construction of temporary roads, structures, and installations (TM-022)
- Allow BLM-authorized surface disturbing activities or the permanent placement of structures and facilities only when the level of change to the characteristics landscape will be low (WC-002). Considerations for BLM approval include:
    - size and scale of the project
    - long-term effect on naturalness and resources
    - loss of opportunities for solitude and primitive recreation
    - potential for use to be accommodated outside of the area

Development Focus Areas

The DRECP LUPA included land use allocations that supported the DRECP's overall renewable energy and conservation goals, as well as measures designed to protect other values and uses of the public lands. One key allocation is that DFAs are public lands that are available for solar, wind, and geothermal development and ancillary facilities. Applications benefit from a streamlined permitting process with predictable survey requirements and simplified mitigation measures.

3.11.3.2 Areas of Critical Environmental Concern

ACECs are designated by the BLM where special attention is needed to protect and/or prevent irreparable damage to historical, cultural, and scenic values; fish; wildlife resources; or other natural systems or processes. ACECs may also be designated to protect human life and safety from natural hazards. While some ACECs fall within the recreation study area (Section 3.10.2), none overlap with the special designations, management allocations, and wilderness resources study area, therefore, they are not discussed further in this section.

3.11.3.3 Wildlife Habitat Management Areas and Movement Corridors

Although the AGFD and the CDFG manage fish and wildlife on BLM-administered land, BLM manages the wildlife habitat. Priority wildlife habitat designations on BLM-administered land are called WHMAs. WHMAs are managed to protect and enhance habitats that support healthy populations of wildlife for conservation and biodiversity, as well as for hunting, fishing, wildlife viewing, and tribal interests.

WHMAs in the special designations, management allocations, and wilderness resources study area are managed to support habitat types, such as riparian habitat, as well as to support specific wildlife species, such as the Sonoran desert tortoise, Sonoran pronghorn, and bighorn sheep. In the special designations, management allocations, and wilderness resources study area, WHMAs are located in the YFO and the Lake Havasu planning areas. Designated WHMAs in the study area include the Colorado and Gila River Riparian Area, Desert Mountains, Palomas Plain, the Wildlife Movement Corridor, and the Lake Havasu Field Office WHMAs (Appendix 1, Figures 3.11-1a through 3.11-1c). Additional information regarding wildlife habitats and specific wildlife management plans are discussed in **Section 3.5**.

3.11.3.4 Local Parks and Wildlife Areas

Quechan Marina Park is a 24-acre city park and marina in Blythe, California, along the Colorado River. The park is a day-use-only facility used for recreation and boat launching, and the city of Blythe uses the park to host festivals and other public events (City of Blythe City Council 2014).

The Goose Flats Wildlife Area is a 62-acre park under the jurisdiction of Riverside County. This area is open to the public, however, there are no facilities present at the wildlife area. There are multiple channels and backwater sloughs separated by vegetated channel bars, which support migratory waterfowl.

3.11.3.5 Other Specially Designated Areas

No wild and scenic rivers, national scenic and/or backcountry byways, national monuments, or any other specially designated areas were identified within the special designations, management allocations, and wilderness resources study area.

WAs and lands with wilderness characteristics are detailed by segment under each zone in Section 3.11.3.6. Table 3.11-1 lists other specially designated areas by segment within the special designations, management allocations, and wilderness resources study area, as well as the distance of other specially designated areas from Project components.

Table 3.11-1 Other Specially Designated Areas in the Study Area

SEGMENT LABEL	SPECIALLY DESIGNATED AREAS	AREA WITHIN SPECIAL DESIGNATIONS STUDY AREA (ACRES)
East Plains and Kofa Zone		
p-01	Palomas Plain WHMA	351
p-02	Palomas Plain WHMA	794
p-03	Desert Mountains WHMA	1,945
	Palomas Plain WHMA	5,518
p-06	Desert Mountains WHMA	4
	Palomas Plain WHMA	5,148
	Wildlife Movement Corridor WHMA	348
d-01	Desert Mountains WHMA	1,869
	Palomas Plain WHMA	4,188
i-01	Palomas Plain WHMA	4,050
i-02	Palomas Plain WHMA	1,823
i-03	Desert Mountains WHMA	1,420
	Palomas Plain WHMA	4,404
	Lake Havasu Field Office WHMA	65
i-04	Desert Mountains WHMA	3,823
	Lake Havasu Field Office WHMA	266
in-01	Desert Mountains WHMA	1,661
	Lake Havasu Field Office WHMA	2,922
x-01	Palomas Plain WHMA	4,119
x-02a/b	Palomas Plain WHMA	12,002
	Desert Mountains WHMA	1,343
	Lake Havasu Field Office WHMA	14
Quartzsite Zone		
p-07	Desert Mountains WHMA	31
	Wildlife Movement Corridor WHMA	1,271
p-08	Desert Mountains WHMA	329
	Wildlife Movement Corridor WHMA	615
i-05	Desert Mountains WHMA	4
qn-02	Desert Mountains WHMA	808
qs-02	Desert Mountains WHMA	288
x-05	Desert Mountains WHMA	1,267
	Wildlife Movement Corridor WHMA	1,751

SEGMENT LABEL	SPECIALLY DESIGNATED AREAS	AREA WITHIN SPECIAL DESIGNATIONS STUDY AREA (ACRES)
x-06	Desert Mountains WHMA	31
	Wildlife Movement Corridor WHMA	2,112
x-07	Desert Mountains WHMA	390
	Wildlife Movement Corridor WHMA	1,880
Copper Bottom Zone		
p-09	Desert Mountains WHMA	3,115
	Wildlife Movement Corridor WHMA	1,893
p-10	Desert Mountains WHMA	846
p-11	Desert Mountains WHMA	1,989
p-12	Desert Mountains WHMA	648
p-13	Desert Mountains WHMA	2
cb-01	Desert Mountains WHMA	1,839
cb-02	Desert Mountains WHMA	1,356
cb-03	Desert Mountains WHMA	1,837
cb-04	Desert Mountains WHMA	663
cb-05	Desert Mountains WHMA	602
i-06	Desert Mountains WHMA	2,368
	Wildlife Movement Corridor WHMA	649
i-07	Desert Mountains WHMA	485
x-08	Desert Mountains WHMA	948
Colorado River and California Zone		
Arizona		
p-15e	Colorado and Gila River Riparian Area WHMA	520
cb-10	Colorado and Gila River Riparian Area WHMA	324
i-08s	Colorado and Gila River Riparian Area WHMA	306
California		
p-15w	Colorado and Gila River Riparian Area WHMA	416
	Goose Flats Wildlife Area	13
ca-04	Colorado and Gila River Riparian Area WHMA	443
ca-05	Colorado and Gila River Riparian Area WHMA	83
x-09	Colorado and Gila River Riparian Area WHMA	160
x-10	Colorado and Gila River Riparian Area WHMA	175
x-11	Colorado and Gila River Riparian Area WHMA	368

[a] A distance of zero (0) indicates the segment crosses the specially designated area.

3.11.3.6 Zone-specific Conditions

East Plains and Kofa Zone

Proposed Action Segments p-01 through p-06

Wilderness Areas and Lands with Wilderness Characteristics

Table 3.11-2 lists the WA or lands with wilderness characteristics that are located in the study area. The Proposed Action route passes adjacent to both the Big Horn Mountains WA and the Kofa NWR WA. The greatest number of WA acres within 1 mile is the Kofa NWR, near Segment p-06 (13,476 acres). One lands with wilderness characteristics polygon (Polygon 17) is identified within the study area for Segment p-06, but this segment does not cross Polygon 17.

Other Special Designations

The special designations, management allocations, and wilderness resources study area of Proposed Action Segments p-01 through p-03 and p-06 include 11,811 acres of the Palomas Plain WHMA. The special designations, management allocations, and wilderness resources study areas of Segments p-03 and p-06 include 1,949 acres of the Desert Mountains WHMA. In addition, the special designations, management allocations, and wilderness resources study area for Segment p-06 includes 348 acres of the Wildlife Movement Corridor WHMA.

Alternative Segments d-01, i-01 through i-04, in-01, and x-01 through x-04

Wilderness Areas and Lands with Wilderness Characteristics

Table 3.11-3 lists the WA or lands with wilderness characteristics located along the alternatives segments in the study area. The Alternative segments cross WA or lands with wilderness characteristics north and south of I-10, east of Quartzsite. There are two lands with wilderness characteristics polygons within the study areas for Alternative segments in this area: Polygons 14 and 34. Of these, Segment in-01 is the only segment that crosses lands with wilderness characteristics (Polygon 34).

Other Special Designations

The special designations, management allocations, and wilderness resources study areas for Alternative Segments d-01 and i-01 through the eastern portion of i-03 include 14,465 acres of the Palomas Plain WHMA, and a portion of the special designations, management allocations, and wilderness resources study area for Segment i-03 includes 1,420 acres of the Desert Mountains WHMA and 65 acres of the Lake Havasu Field Office WHMA. The western portion of the special designations, management allocations, and wilderness resources study area for Segment i-04 includes 3,823 acres of the Desert Mountains WHMA, as well as 266 acres of the Lake Havasu Field Office WHMA. The special designations, management allocations, and wilderness resources study area for Segment in-01 includes 1,661 acres of the Desert Mountains WHMA and 2,922 acres of the Lake Havasu Field Office WHMA. The special designations, management allocations, and wilderness resources study areas for Segments x-01 and x-02 include 16,121 acres of the Palomas Plain WHMA, and the special designations, management allocations, and wilderness resources study area for Segment x-02 also includes 1,343 acres of the Desert Mountains WHMA and 14 acres of the Lake Havasu Field Office WHMA.

Table 3.11-2 WA or Lands with Wilderness Characteristics along the Proposed Action in the East Plains and Kofa Zone

SEGMENT	WA/LANDS WITH WILDERNESS CHARACTER-ISTICS	TOTAL ACRES	ACRES REMOVED BY ROUTE SEGMENT (VISUAL ESTIMATE)	ACRES WITHIN STUDY AREA	OVERLAP WITH PRIOR BLM LANDS WITH WILDERNESS CHARACTERIST-ICS INVENTORY	OVERLAP WITH CITIZEN-SUPPLIED DATA
p-01	Big Horn Mountains WA	21,000	0	1,958	0	0
p-02	Not applicable	0	0	0	0	0
p-03	Not applicable	0	0	0	0	0
p-04	Not applicable	0	0	0	0	0
p-05	Not Applicable	0	0	0	0	0
p-06	Kofa NWR WA	547,700	0	13,476	0	0
	Polygon 17	18,721	0	675	Beaver Dam Mtns. N. Add. (5,437 acres) and Little Horn Mts. West (12,083 acres)	Polygon 83 (5,484 acres)

Table 3.11-3 WA or Lands with Wilderness Characteristics along the Alternative Segments in the East Plains and Kofa Zone

SEGMENT	WA/LANDS WITH WILDER-NESS CHARACTER-ISTICS	TOTAL ACRES	ACRES REMOVED BY ROUTE SEGMENT (VISUAL ESTIMATE)	ACRES WITHIN STUDY AREA	OVERLAP WITH PRIOR BLM LANDS WITH WILDERNESS CHARACTER-ISTICS INVENTORY	OVERLAP WITH CITIZEN-SUPPLIED DATA
d-01	Eagletail Mountains WA	97,880	0	166	0	0
i-01	Not Applicable	0	0	0	0	0
i-02	Not Applicable	0	0	0	0	0
i-03	Not Applicable	0	0	0	Polygon 114 (10,701 acres) and part of Polygon 107 (16,736 acres)	Polygon 114 (10,701 acres) and part of Polygon 107 (16,736 acres)
i-04	Polygon 14	8,945	0	2,367	Polygon 114 (10,701 acres) and part of Polygon 107 (16,736 acres)	Polygon 114 (10,701 acres) and part of Polygon 107 (16,736 acres)
	Polygon 34	11,654	0	900	0	0
	Not Applicable	0	0	0	0	Polygon 109 (16,738 acres) and Polygon 120 (9,489 acres)

SEGMENT	WA/LANDS WITH WILDER-NESS CHARACTER-ISTICS	TOTAL ACRES	ACRES REMOVED BY ROUTE SEGMENT (VISUAL ESTIMATE)	ACRES WITHIN STUDY AREA	OVERLAP WITH PRIOR BLM LANDS WITH WILDERNESS CHARACTER-ISTICS INVENTORY	OVERLAP WITH CITIZEN-SUPPLIED DATA
in-01	Polygon 14	8,945	0	111	0	Polygon 109 (16,738 acres) and Polygon 120 (9,489 acres)
	Polygon 34	11,654	42 (splits polygon with one <5,000 acres)	2,888	0	Polygon 131 (20,152 acres)
	Not applicable	0	0	0	0	Polygon 109 (16,738 acres) and Polygon 120 (9,489 acres)
x-01	Not applicable	0	0	0	0	0
x-02	Not applicable	0	0	0	0	0
x-03	Not applicable	0	0	0	0	0
x-04	Not applicable	0	0	0	0	Polygon 114 (10,701 acres) and part of Polygon 107 (16,736 acres)
Alt. SCS Dist. Line	Not applicable	0	0	0	0	0

Quartzsite Zone

Proposed Action Segments p-07 and p-08

Wilderness Areas and Lands with Wilderness Characteristics

Table 3.11-4 lists the WA or lands with wilderness characteristics that are within the Quartzsite area and along the Proposed Action. One segment of the Proposed Action, Segment p-07, is 3,996 feet from the Kofa NWR WA, with 81 acres within 1 mile. There are no lands with wilderness characteristics within the study area for the Proposed Action segments.

Other Special Designations

The special designations, management allocations, and wilderness resources study areas for Proposed Action Segments p-07 and p-08 include 1,886 acres of the Wildlife Movement Corridor WHMA and 360 acres of the Desert Mountains WHMA.

Alternative Segments i-05, qn-01 and qn-02, qs-01 and qs-02, x-05, x-06, and x-07

Wilderness Areas and Lands with Wilderness Characteristics

Table 3.11-5 lists the WA or lands with wilderness characteristics that are within the Quartzsite area and along the Alternative segments. Lands with wilderness characteristics Polygon 35_SW and Polygon 13 are located within the study areas for the Alternative segments in this zone; Polygon 35_SW is crossed by Segment qn-02.

Other Special Designations

The special designations, management allocations, and wilderness resources study area for Segment i-05 includes 4 acres of the Desert Mountains WHMA. A portion of the special designations, management allocations, and wilderness resources study areas for Alternative Segments qn-02 and qs-02 include 1,096 acres of the Desert Mountains WHMA. The special designations, management allocations, and wilderness resources study area of Segment x-05 includes 1,267 acres of the Desert Mountains WHMA and 1,751 acres of the Wildlife Movement Corridor WHMA. The special designations, management allocations, and wilderness resources study areas for Segments x-06 and x-07 include 3,992 acres of the Wildlife Movement Corridor WHMA and 421 acres of the Desert Mountains WHMA.

Table 3.11-4 WA or Lands with Wilderness Characteristics along the Proposed Action in the Quartzsite Zone

SEGMENT	WA/LANDS WITH WILDER-NESS CHARACTER-ISTICS	TOTAL ACRES	ACRES REMOVED BY ROUTE SEGMENT (VISUAL ESTIMATE)	ACRES WITHIN STUDY AREA	OVERLAP WITH PRIOR BLM LANDS WITH WILDER-NESS CHARACTER-ISTICS INVENTORY	OVERLAP WITH CITIZEN-SUPPLIED DATA
p-07	Kofa NWR WA	547,700	0	81	0	0
p-08	Not Applicable	0	0	0	0	0

Table 3.11-5 WA or Lands with Wilderness Characteristics along the Alternative Segments in the Quartzsite Zone

SEGMENT	WA/LANDS WITH WILDER-NESS CHARACTER-ISTICS	TOTAL ACRES	ACRES REMOVED BY ROUTE SEGMENT (VISUAL ESTIMATE)	ACRES WITHIN STUDY AREA	OVERLAP WITH PRIOR BLM LANDS WITH WILDER-NESS CHARACTER-ISTICS INVENTORY	OVERLAP WITH CITIZEN-SUPPLIED DATA
i-05	Not applicable	0	0	0	0	Polygon 109 (16,738 acres), Polygon 120 (9,489 acres), Polygon 131 (20,152 acres)
qn-01	Not applicable	0	0	0	0	0
qn-02	Polygon 35_SW	7,006	976 (splits polygon with three <5,000 acres and one polygon >5,000 acres)	2,195	0	Polygon 124 (5,870 acres) and Polygon 126 (16,282 acres)
qs-01	Not applicable	0	0	0	0	Polygon 109 (16,738 acres) and Polygon 120 (9,489 acres)
qs-02	Polygon 35_SW	7,006	0	53	0	Polygon 124 (5,870 acres) and Polygon 126 (16,282 acres)
x-05	Kofa NWR WA	547,700	0	69	0	0
	Polygon 13	9,372	0	664	0	Polygon 109 (16,738 acres) and Polygon 120 (9,489 acres)
x-06	Not applicable	0	0	0	0	Polygon 131 (20,152 acres)
x-07	Not applicable	0	0	0	0	Polygon 109 (16,738 acres) and Polygon 120 (9,489 acres)

Copper Bottom Zone

Proposed Action Segments p-09 through p-14

Wilderness Areas and Lands with Wilderness Characteristics

There are no WAs within the special designations, management allocations, and wilderness resources study area in the Copper Bottom Zone (Table 3.11-6). Lands with wilderness characteristics Polygon 23 is the only polygon located within the study areas for the Proposed Segments in this zone, and it is crossed by Segment p-09.

Other Special Designations

The special designations, management allocations, and wilderness resources study areas for Proposed Action route Segments p-09 through p-14 include 6,600 acres of the Desert Mountains WHMA and 1,893 acres of the Wildlife Movement Corridor WHMA.

Alternative Segments cb-01 through cb-06, i-06, i-07, and x-08

Wilderness Areas and Lands with Wilderness Characteristics

There are no WAs within the special designations, management allocations, and wilderness resources study area in the Copper Bottom Zone (Table 3.11-7). Lands with wilderness characteristics Polygon 23 is the only polygon located within the study areas for the Alternative segments in this zone, and it is crossed by Segments cb-01 through cb-06.

Other Special Designations

The special designations, management allocations, and wilderness resources study areas for Alternative Segments cb-01 through cb-05, i-06, i-07, and x-08 include 12,281 acres of the Desert Mountains WHMA. The special designations, management allocations, and wilderness resources study area for Segment i-06 includes 649 acres of the Wildlife Movement Corridor WHMA.

Alternative Segment cb-02 crosses the trail eight times and runs adjacent to Johnson Canyon. Alternative Segments cb-03 and cb-05 each cross the trail once.

Table 3.11-6 WA or Lands with Wilderness Characteristics along the Proposed Action in the Copper Bottom Zone

SEGMENT	WA/LANDS WITH WILDER-NESS CHARACTER-ISTICS	TOTAL ACRES	ACRES REMOVED BY ROUTE SEGMENT (VISUAL ESTIMATE)	ACRES WITHIN STUDY AREA	OVERLAP WITH PRIOR BLM LANDS WITH WILDERNESS CHARACTERISTICS INVENTORY	OVERLAP WITH CITIZEN-SUPPLIED DATA
p-09	Polygon 23	5,041	9	805	0	Polygon 103 (7,163 acres)
	Not Applicable	0	0	0	0	Polygon 108 (6,466 acres)
p-10	Polygon 23	5,041	0	245	0	Polygon 103 (7,163 acres)
	Not applicable	0	0	0	0	Polygon 108 (6,466 acres)
p-11	Polygon 23	5,041	0	124	0	Polygon 103 (7,163 acres)
	Not applicable	0	0	0	0	Polygon 108 (6,466 acres)
p-12	Not applicable	0	0	0	0	Polygon 103 (7,163 acres)
p-13	Not applicable	0	0	0	0	0
p-14	Not applicable	0	0	0	0	0

Table 3.11-7 WA or Lands with Wilderness Characteristics along the Alternative Segments in the Copper Bottom Zone

SEGMENT	WA/LANDS WITH WILDER-NESS CHARACTER-ISTICS	TOTAL ACRES	ACRES REMOVED BY ROUTE SEGMENT (VISUAL ESTIMATE)	ACRES WITHIN STUDY AREA	OVERLAP WITH PRIOR BLM LANDS WITH WILDERNESS CHARACTER-ISTICS INVENTORY	OVERLAP WITH CITIZEN-SUPPLIED DATA
cb-01	Polygon 23	5,041	624 (splits polygon with one <5,000 acres)	3,189	0	Polygon 103 (7,163 acres)
	Not applicable	0	0	0	0	Polygon 108 (6,466 acres)
cb-02	Polygon 23	5,041	408 (splits polygon with one <5,000 acres)	2,025	0	Polygon 103 (7,163 acres)
	Not applicable	0	0	0	0	Polygon 108 (6,466 acres)
cb-03	Polygon 23	5,041	0	21	0	Polygon 103 (7,163 acres)
	Not applicable	0	0	0	0	Polygon 108 (6,466 acres)
cb-04	Polygon 23	5,041	279 (splits polygon with one <5,000 acres)	2,890	0	Polygon 103 (7,163 acres)
cb-05	Polygon 23	5,041	0	757	0	Polygon 103 (7,163 acres)
cb-06	Polygon 23	5,041	0	757	0	Polygon 103 (7,163 acres)
i-06	Not applicable	0	0	0	0	Polygon 108 (6,466 acres)
	Not applicable	0	0	0	0	Polygon 124 (5,870 acres) and Polygon 126 (16,282 acres)
i-07	Not applicable	0	0	0	0	0
i-08s	Not applicable	0	0	0	0	0
x-08	Not applicable	0	0	0	0	Polygon 103 (7,163 acres)

Colorado River and California Zone

The Proposed and Alternative segments in the Colorado River and California Zone would occur within an allocated DFA.

Proposed Action Segments p-15e through p-18

Wilderness Areas and Lands with Wilderness Characteristics

There are no WAs or lands with wilderness characteristics along the Proposed Action in the Colorado River to California Zone.

Other Special Designations

The western portion of the special designations, management allocations, and wilderness resources study area for Segment p-15e (Arizona) includes 520 acres of the Colorado and Gila River Riparian Area WHMA. The special designations, management allocations, and wilderness resources study area for proposed Segment p-15w includes 416 acres of the Colorado and Gila River Riparian Area WHMA, and 13 acres of the far northern end of the Goose Flats Wildlife Area.

Alternative Segments ca-01, ca-02, ca-04 through ca-07, ca-09, i-08s, x-09 through x-16, and x-19

Wilderness Areas and Lands with Wilderness Characteristics

There are no WAs or lands with wilderness characteristics along the Alternative Segments in the Colorado River to California Zone

Other Special Designations

The special designations, management allocations, and wilderness resources study areas for Alternative Segments ca-04, ca-05, and x-09 through x-11 include 1,706 acres of the Colorado and Gila River Riparian Area WHMA. The special designations, management allocations, and wilderness resources study area for Segment cb-10 includes 914 acres of the Colorado and Gila River Riparian Area WHMA. The special designations, management allocations, and wilderness resources study area for Segment i-08s includes 914 acres of the Colorado and Gila River Riparian Area WHMA.

The eastern portion of the special designations, management allocations, and wilderness resources study area for Segment i-08s also overlaps with the Ehrenberg Sandbowl, a popular OHV recreation area located on Reclamation land. Additional information about the Ehrenberg Sandbowl can be found in the Recreation Baseline Technical Report (HDR 2017e).

3.12 NOISE

3.12.1 Applicable Laws, Regulations, Policies, and Plans

3.12.1.1 Federal

The EPA established general guidelines regarding environmental noise levels in 1974. A 24-hour noise exposure of less than 70 decibels (dB) is the recommended criterion to prevent measurable hearing loss over an extended period of time. A maximum day-night sound level (L_{dn}) of 55 A-weighted decibels (dBA) outdoors is the criterion to prevent annoyance and activity interference in residential areas. State and local governments have the authority to establish noise limits that are equal to or stricter than the 1974 EPA guidelines.

3.12.1.2 State

The Project would be located in both Arizona and California; thus, noise guidelines for both states are relevant.

Arizona

Arizona has adopted by reference the Federal rules for noise protection. In addition, the state of Arizona regulates OHV equipment noise in ARS Title 28, Chapter 3, Article 20. OHVs are required to use a noise dissipative device such as a muffler that prevents sound above 96 dB.

The state of Arizona also regulates watercraft on waters of the state (which includes the Colorado River) in AAC Section R12-4-516 which states that watercraft operating on waters of the state must meet the following noise criteria:

- A noise level of 86 dBA, measured at a distance of 50 feet or more from the watercraft;
- A stationary noise level of 90 dBA for engines manufactured before January 1, 1993;
- A stationary noise level of 88 dBA for engines manufactured on or after January 1, 1993; and
- A noise level of 75 dBA, measured from the shoreline.

California

The California Health and Safety code (HSC 46000–46002) qualitatively defines excessive noise as a hazard. California does not have a comprehensive noise statute but requires a noise element to be incorporated into all city and county general plans. A public draft of the update to the General Plan Guidelines for the state of California was published by the Governor's Office of Planning and Research in October 2015.

3.12.1.3 Local

Noise is primarily regulated by local general plans and ordinances. Most cities have at least qualitative nuisance ordinances used to protect the local noise environment. Some of the local ordinances also set forth specific quantitative noise criteria.

La Paz County

According to the La Paz County Zoning Ordinance (2012), any noise that injures or endangers the comfort, repose, health, or safety of others is defined as a public nuisance. No quantitative noise limits are identified for La Paz County.

Maricopa County

The Maricopa County Noise Ordinance P-23 (Maricopa County 2006) states it is unlawful to allow noise that disturbs the peace or quiet of any neighborhood. This does not apply to noise that is produced during normal conduct of business provided that the noise occurs during normal and customary hours of operation for such a business, and that the operation is conducted legally.

Exemptions to the noise ordinance include noise emanating from construction and repair equipment when used in compliance with existing Maricopa County rules and regulations. Noise emanating from safety signals and warning devices is also exempt from the noise ordinance regulations.

The Tonopah/Arlington Area Plan (Maricopa County 2007) has established a goal of minimizing noise impacts as a way to preserve the natural and cultural environment. Additionally, the plan encourages compatible land use relationships with sources of excessive noise. No quantitative noise limits were identified for the Tonopah/Arlington area.

Riverside County

According to Policy N 1.3 of the Riverside County General Plan (2017), noise attenuation measures are required for any land use that is exposed to levels higher than 65 Community Noise Equivalent Level (CNEL). Policy N 4.1 in Chapter 7 of the Riverside County General Plan (2017) prohibits facility-related noise received by any sensitive receptor to exceed the levels in Table 3.12-1. Noise from the transmission lines and substations could be considered facility-related noise.

Table 3.12-1 Riverside County Sensitive Land Use Noise Standards for Facility-related Noise

TIME	MAXIMUM ALLOWABLE DBA RECEIVED BY SENSITIVE LAND USE
10 p.m. to 7 a.m.	45 dBA – 10-minute L_{eq}
7 a.m. to 10 p.m.	65 dBA – 10-minute L_{eq}

Source: Riverside County General Plan (2015a)

Notes: dBA = A-weighted decibel, L_{eq} = equivalent sound level

The Riverside County General Plan Policies N 13.1–13.4 address noise attributable to temporary construction. Under these guidelines, construction activities must establish hours of regulation to prevent or mitigate excessive or adverse noise impacts. Additionally, a developer is required to submit a plan for construction-related noise mitigation to Riverside County to be reviewed and approved before being issued a grading permit. The plan must describe the proposed location of construction equipment and the noise mitigation methods to be used for the construction equipment. According to Policy N 13.4 of the Riverside County General Plan, all noise reduction features on construction equipment must be at least as effective as those installed by the manufacturer. According to Policy N 19.5 of the Riverside County General Plan, new developments with the potential to generate a substantial noise impact are required to inform affected users of the effects of these noise impacts during the environmental review process. General standards for exterior noise levels at occupied properties according to Riverside County Ordinance No. 847 are shown in Table 3.12-2.

Exemptions from these standards include private construction projects located 0.25 mile or more from an inhabited dwelling. If construction activity occurs within 0.25 mile of an inhabited dwelling, the following apply:

- Construction must not occur between the hours of 6 p.m. and 6 a.m. from June through September.
- Construction must not occur between the hours of 6 p.m. and 7 a.m. from October through May.

Table 3.12-2 Riverside County Exterior Noise Level Standards

GENERAL PLAN FOUNDATION COMPONENT	GENERAL PLAN LAND USE DESIGNATION	MAXIMUM DECIBEL LEVEL	
		7 A.M.–10 P.M.	10 P.M.–7 A.M.
Community Development	Estate density	55	45
	Very low density	55	45
	Low density residential	55	45
	Medium density	55	45
	Medium high density	55	45
	High density residential	55	45
	Very high density	55	45
	Highest density	55	45
	Retail commercial	65	55
	Office commercial	65	55
	Tourist commercial	65	55
	Community center	65	55
	Light industrial	75	55
	Heavy industrial	75	75
	Business park	65	45
	Public facility	65	45
	Specific plan-residential	55	45
	Specific plan-light	75	55
	Specific plan-heavy	75	75
Rural Community	Estate density	55	45
	Very low density	55	45
	Low density residential	55	45
Rural	Rural residential	45	45
	Rural mountainous	45	45
	Rural desert	45	45
Agriculture	Agriculture	45	45
Open Space	Conservation	45	45
	Conservation habitat	45	45
	Recreation	45	45
	Rural	45	45
	Watershed	45	45
	Mineral resources	75	45

Source: Riverside County Ordinance No. 847

City of Blythe

A framework of the overall goals concerning the noise environment in Blythe is outlined by a set of Land Use Compatibility Guiding Policies in the City of Blythe General Plan 2025 (2007a) Noise Element. Relevant noise-related policies are outlined below:

- **Policy**: Areas within the City of Blythe will be designated as noise-impacted if exposed to existing or projected future noise levels at the exterior of buildings that exceed 60 dB L_{dn} (or CNEL).
- **Policy**: New development of residential or other noise-sensitive land uses will not be permitted in noise-impacted areas unless effective mitigation measures are incorporated into the specific design of such projects to reduce noise levels to 60 dB L_{dn} (or CNEL) or less within outdoor activity areas and 45 dB L_{dn} (or CNEL) or less within interior living spaces.
- **Policy**: New development of industrial, commercial or other noise-generating land uses (including roadways, railroads, and airports) will not be permitted if resulting noise levels will exceed 60 dB L_{dn} (or CNEL) at the boundary of areas containing or planned and zoned for residential or other noise-sensitive land uses.

Town of Quartzsite

The Town of Quartzsite General Plan (2014) defines the land use categories within the Town of Quartzsite. No quantitative noise limits are identified for the Town of Quartzsite.

3.12.1.4 Summary

The study area is subject to general Federal and state qualitative noise guidelines and a Riverside County ordinance that may limit the hours of construction activity. There are also limits on environmental noise, and it is assumed that they would apply to operational (corona) noise. Table 3.12-3 summarizes the applicable noise guidelines at the Federal, county, and local levels of government.

Table 3.12-3 Summary of Noise Standards Relevant to the Project Area

LEVEL	SOURCE	CRITERIA	NOTES
Federal	US EPA	24-hour noise exposure less than 70 dB	Guideline
Federal	US EPA	Maximum L_{dn} 55 dBA outdoors	Guideline
Local	Riverside County General Plan (2015a)	Noise attenuation measures required for land use exposed to levels greater than 65 CNEL	Requirement
Local	Riverside County General Plan (2015a)	Stationary source facility-related interior limits: 55 L_{eq} (day), 40 L_{eq} (night)	Requirement
Local	Riverside County General Plan (2015a)	Stationary source facility-related exterior limits: 65 L_{eq} (day), 45 L_{eq} (night)	Requirement
Local	Riverside County General Plan (2015a)	Construction not to occur 6 p.m.–6 a.m.	Required June–September
Local	Riverside County General Plan (2015a)	Construction not to occur 6 p.m.–7 a.m.	Required October–May
Local	City of Blythe General Plan (2007a)	Exterior level of 60 dB L_{dn}	Noise impact criteria

LEVEL	SOURCE	CRITERIA	NOTES
Local	City of Blythe General Plan (2007a)	Interior level of 45 dB L_{dn}	Noise impact criteria

Notes: CNEL = Community Noise Equivalent Level

3.12.2 Fundamentals of Acoustics

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity and that interferes with or disrupts normal activities. Although prolonged exposure to high noise levels has been demonstrated to cause hearing loss (e.g., EPA suggests that noise above 70 dB over an extended period can be related to hearing loss), the principal human response to environmental noise when lower than this threshold is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise; the perceived importance of the noise, and its appropriateness in the setting; the time of day and the type of activity during which the noise occurs; and the sensitivity of the individual.

Noise may also affect wildlife, as potentially demonstrated by apparent disruption of resting, foraging, migrating, and other life-cycle activities; however, sensitivity to noise varies with species. Further, wildlife observed in proximity to human activities and land uses have likely developed habituation (to a degree that allows their life-cycle activities to continue without significant effect) to continuous, intermittent, and even impulsive man-made sounds.

Sound is generally characterized by several variables, including frequency and intensity. Frequency describes the pitch of the sound and is measured in Hertz (Hz), while intensity describes the sound's loudness and is measured in dB. A sound level of zero dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels in the range of approximately 110 to 120 dB can be felt inside the human ear as discomfort, while levels between 130 to 140 dB are felt as pain (Berglund and Lindvall 1995). The minimum change in the sound level of individual events that an average human ear can detect is about 1 to 2 dB. A 3 to 5 dB change is readily perceived. A change in sound level of about 10 dB is usually perceived by the average person as a doubling (or if decreasing by 10 dB, halving) of the sound's loudness.

Due to the logarithmic nature of the decibel unit, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically; however, some simple rules are useful in dealing with sound levels. For instance, if a sound's energy is doubled, the sound level increases by 3 dB, regardless of the initial sound level. By way of example, if a sound intensity of 60 dB is doubled, the new intensity will be 63 dB; likewise, if a sound intensity level of 80 dB is doubled, the new intensity will be 83 dB.

Sound from a tuning fork contains a single frequency (a pure tone), but most sounds one hears in the environment do not consist of a single frequency and instead are composed of a broad band of frequencies differing in sound level. The method commonly used to quantify environmental sounds consists of evaluating all frequencies of a sound according to a weighting system that reflects the typical frequency-dependent sensitivity of average healthy human hearing. This is called "A-weighting," and the decibel level measured is referred to as dBA.

Most environmental noise includes a mixture of noise from distant sources that creates a relatively steady background noise in which no particular source is identifiable. A single descriptor, the L_{eq}, may be used to describe sound that is changing in level. L_{eq} is the energy-mean dBA during a measured time interval. It is the "equivalent" constant sound level that would have to be produced by a given source to equal the acoustic energy contained in the fluctuating sound level measured. In addition to the energy-average level, it is often desirable to know the acoustic range of the noise source being measured. This is accomplished through the maximum L_{eq} (L_{max}) and minimum L_{eq} (L_{min}) indicators that represent the root-mean-square maximum and minimum noise levels measured during the monitoring interval. The L_{min} value obtained for a particular monitoring location is often called the acoustic floor for that location. L_{dn} is another metric to define noise levels. The L_{dn} is defined as the L_{eq} (in dBA) for a 24-hour day with a certain numeric penalty (e.g., 10 dB) added to nighttime sound levels (e.g., between 10:00 p.m. and 7:00 a.m.) to compensate for increased sensitivity to noise during usually quieter nighttime hours.

Sound levels of typical noise sources and environments are provided in Table 3.12-4 to provide the reader a frame of reference.

Table 3.12-4 Sound Pressure Levels of Typical Noise Sources and Noise Environments

COMMON OUTDOOR ACTIVITIES	NOISE LEVEL (dBA)	COMMON INDOOR ACTIVITIES
Jet Fly-over at 1,000 ft. (300 meters [m])	110-100	Rock Band
Gas Lawn Mower at 3 ft. (1 m)	100-90	
Diesel Truck at 50 ft. (15 m), at 50 mph (80 km/hr.)	90-80	Food Blender at 3 ft. (1 m)
Commercial Area, Gas Lawn Mower at 100 ft. (30 m)	70	Vacuum Cleaner at 10 ft. (3 m)
Heavy Traffic at 300 ft. (90 m)	60	Normal Speech at 3 ft. (1 m)
Quiet Urban Daytime	50-40	Large Business Office
Quiet Urban/Suburban Nighttime	40-30	Theater, Large Conference Room (Background)
Quiet Rural Nighttime	30-20	Library, Bedroom at Night, Concert Hall (Background)
	20-10	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	0	

Source: California Department of Transportation 2009

3.12.3 Study Area

The noise study area includes a 4,000 foot with corridor encompassing the Proposed and Alternative segments. The noise study area also encompasses 200-feet on either side of the alternative SCS 12kV distribution line.

Applicable noise guidelines and limits were identified based on a review of publicly available Federal, state, county, and local regulatory programs.

Existing land uses and noise-sensitive land uses (receptors) were identified by reviewing aerial photographs and online resources (street views, etc.). A site visit was conducted in August 2016 to generally confirm noise-sensitive receptor locations and types. Existing noise levels in the Project Area were estimated using EPA and Federal Transit Administration (FTA) methods.

3.12.4 Existing Conditions

3.12.4.1 Existing Background Noise

Much of the study area is relatively rural. As a result, with the exception of areas along major highways and where clusters of development occur, noise levels throughout much of the noise study area are low.

Existing noise sources in the study area include highways, roadways, OHV use, agricultural activities, population centers, and natural noise-producing sources such as wind, insects, and other animals. Another low-level source of noise is from existing transmission lines that emit corona noise under certain atmospheric conditions.

Highway Noise

Because the character of the existing study area is rural and noise levels are relatively low, the existing roadway noise levels in the noise study area were approximated using methods established by EPA in 1974 and by FTA in 2006. These methods can be used to estimate existing noise levels based on proximity of communities to roadways and highways.

Table 3.12-5 presents the information used in this report to estimate the existing noise levels along highways in the study area. The table lists general estimates from the FTA (2006) for noise levels near highways.

Table 3.12-5 Estimated Noise Exposure near Highways and Other Roadways

DISTANCE FROM SOURCE (FEET)		POPULATION DENSITY	NOISE EXPOSURE ESTIMATES (DBA)			
INTERSTATE HIGHWAYS[A]	OTHER ROADWAYS[B]	(PEOPLE PER SQUARE MILE)	LEQ DAY	LEQ EVENING	LEQ NIGHT	LDN
10–50			75	70	65	75
50–100			70	65	60	70
100–200			65	60	55	65
200–400			60	55	50	60
400–800			55	50	45	55
800 and up			50	45	40	50
	10–50		70	65	60	70
	50–100		65	60	55	65
	100–200		60	55	50	60
	200–400		55	50	45	55
	400 and up		50	45	40	50
		1–100	35	30	25	35
		100–300	40	35	30	40
		300–1,000	45	40	35	45
		1,000–3,000	50	45	40	50
		3,000–10,000	55	50	45	55
		10,000–30,000	60	55	50	60
		30,000 and up	65	60	55	65

Source: FTA (2006)

[a] Roadways with four or more lanes that permit trucks, with traffic at 60 mph.

[b] Parkways with traffic at 55 mph, but without trucks, and city streets with the equivalent of 75 or more heavy trucks per hour and 300 or more medium trucks per hour at 30 mph.

Airport Noise

Although multiple airports are within the Project Area, only Blythe Airport generates regular traffic within the noise study area. The Blythe Municipal Airport Existing Noise Contours were obtained from the Riverside County General Plan Noise Element (December 2015).

Corona Noise

Corona is an electrical discharge associated with transmission lines produced by the ionization of fluid (most often humidity in the air) surrounding an electrically charged conductor. In some instances, this phenomenon can produce low-level audible noise. Corona is not a steady source of noise; rather, it varies with humidity conditions. Corona noise measurements taken near a 500kV double-circuit transmission line near Serrano Substation in Anaheim Hills, when humidity was greater than 80 percent and temperatures were in the range of 60 °F (conditions contributing to high corona noise), are shown in Table 3.12-6.

Table 3.12-6 Corona Noise Levels near Serrano Substation

LOCATION	MEASURED LEVEL (DBA L_{EQ})
Directly under the structure	46
Directly below outside conductor	44
50 feet from outside conductor	43
100 feet from outside conductor	39

Source: Veneklasen Associates, Inc. (2004)

In addition to using measured noise levels from transmission line near Serrano Substation in Anaheim Hills to represent existing conditions near the Project, the Bonneville Power Administration's Corona and Field Effects (CAFE) Program was used to predict audible corona noise at 10 locations in the Project Area. Each location is representative of a different layout of the Project and existing transmission lines within the proposed ROW. The modeling results for audible noise under foul weather conditions for existing conditions are shown in Table 3.12-7.

Table 3.12-7 Modeled Maximum Audible Noise Under Foul Conditions at Edge of ROW for Existing Conditions

LOCATIO N NO.	STATE	APPROXIMATE LOCATION	EXISTING AUDIBLE NOISE UNDER FOUL CONDITIONS (L50 DBA)		
			PEAK IN ROW	LEFT SIDE[A] OF ROW	RIGHT SIDE[B] OF ROW
1	AZ	North of Delaney Substation,	61.5	55.0	52.9
2	AZ	Alternative 1 west of Delaney Substation	62.5	58.8	56.5
3	AZ	I-10 Utility Corridor	N/A	N/A	N/A
4	AZ	Kofa National Wildlife Refuge	60.1	55.7	55.7
5	AZ	North of I-10 and northeast of Quartzsite	37.5	34.1	33.6
6	AZ	South of I-10 and south of Quartzsite	40.8	36.5	36.5
7	AZ	Copper Bottom Pass	57.1	54.7	52.7
8	CA	Farmland east of Blythe	58.7	54.6	54.6
9	CA	East of Colorado River Substation	41.8	37.8	33.9
10	CA	East of Colorado River Substation	60.1	55.7	52.4

a = Left side is the south side at all locations, but location 1 is on the west side.
b = Right side is the north side at all locations, but location 1 is on the east side.

As corona noise travels away from the conductors (the cables transmitting electricity), noise drops by 6 dB each time the distance between the conductor and observer is doubled; this attenuation rate (minus 6 dB per distance doubled) is also known as the Inverse Square Law. The Electric Power Research Institute (EPRI 2007) references a 55-dBA guideline as a maximum recommended day-night average for corona noise levels in residential areas and other areas where people spend widely varying amounts of time.

Combined Noise

Figures 3.12-1a-u (Appendix 1) graphically show the estimated baseline noise levels in the study area (noise levels are expressed as L_{dn}, which is one type of 24-hour average noise level that puts more emphasis on nighttime noise events).

Based on the rural nature of most of the study area, proximity to major surface transportation corridors and population density, existing noise levels are very low in the noise study area. As discussed in more detail below, the areas in and around Blythe are projected to have slightly higher noise levels than other portions of the noise study area.

Sources of existing background noise are described in the following sections by geographic area.

3.12.4.2 Existing Zone-specific Conditions

East Plains and Kofa Zone

Existing noise sources in the East Plains and Kofa Zone include the existing DPV1 500kV transmission line, Delaney Substation, and the Harquahala Power Plant. The DPV1 500kV transmission line is located adjacent to the Proposed Action route and could produce corona noise under periods of high humidity. Under these conditions, corona noise rapidly fades into the background noise outside of the transmission line ROW. The Harquahala Power Plant is located along alternative Segment d-01. Power plants usually have a variety of stationary and mobile noise sources, both indoors and outdoors. Sometimes power plants produce low frequency noise that is audible as a hum off-site. However, noise from power plants usually blends into the background noise environment at distances of a few hundred yards. The abandoned Salome Emergency Airfield is located along Alternative Segment x-03 but would not be considered a noise source.

In general, existing noise in this area is very low; averaging less than 40 dBA $L_{\mathbf{dn}}$. Higher background noise is present along (I-10 at an estimated 60 to 65 dBA $L_{\mathbf{dn}}$ in areas adjacent to the highway ROW.

Quartzsite Zone

Existing noise sources in the Quartzsite Area include the existing DPV1 500kV transmission line, I-10 and SR 95. The DP1 transmission line is located adjacent to the Proposed Action route and could produce corona noise under periods of high humidity. Several Alternative Segments are located adjacent to I-10 and SR 95, and highway noise levels can reach 60 to 65 dBA L_{dn} in proximity to the highway (adjacent to the highway ROW). A radio control airfield is located outside of the study area near alternative Segment qn-02.

In general, existing noise in this area is very low; most areas are estimated at less than 40 dBA L_{dn}. Higher background noise is present along I-10 and SR 95 at an estimated 60 to 65 dBA L_{dn}.

Seasonal visitors to the Quartzsite area bring a temporary increase in winter-time traffic and, therefore, noise levels to this area.

Copper Bottom Zone

Existing noise sources in the Copper Bottom Zone include the existing DPV1 transmission line, I-10, YPG, and the proposed Arizona Peace Trail. The DPV1 transmission line is located adjacent to the Proposed Action route and Alternative Segment cb-03 and could produce corona noise under periods of high humidity. The proposed Arizona Peace Trail is located near or crosses Proposed Action Segments p-10, p-11, p-12, and p-13 as well as Alternative Segments cb-02 and cb-05. This trail attracts frequent OHV riders, which could result in background noise during daytime hours ranging from 40 to 65 dBA in areas adjacent to the trail. Alternative Segments i-06 and i-07 are located adjacent to I-10.

In general, existing noise in this area is very low; most areas are estimated at less than 40 dBA L_{dn}. Higher background noise is present along I-10 at an estimated 60 to 65 dBA L_{dn}. Periodic increases in noise occur from OHV use and military operations.

Colorado River and California Zone

Existing noise sources in the Colorado River and California Zone area include the DPV1 transmission line, Colorado River Substation, I-10, US 95, SR 78, farming equipment, airports, and construction noise from planned solar facilities in the area.

The DPV1 500kV transmission line is located adjacent to the Proposed Action and could produce corona noise under periods of high humidity. Roadway and farming equipment noise would be present along Proposed Action Segments p-15w and p-16, and noise from those activities varies depending on vehicle volumes and vehicle mix. Proposed solar energy facilities are adjacent to Segments p-17 and p-18, which could present noise especially during periods of construction. Construction noise levels are generally below 65 dBA within a few hundred feet outside of the limits of construction.

Other existing noise sources in the area include a private-use airport, Cyr Aviation Airport, adjacent to alternative Segment ca-05. Airport noise levels are usually less than 65 dBA L_{dn} in residential areas off-site. Roadway and farming equipment noise would be present in proximity to several Alternative Segments in this area, and they vary depending on the volume and vehicle mix.

In general, existing noise in this area is very low; most areas are estimated at less than 40 dBA L_{dn}. However, several areas show higher background noise, including areas along I-10, Highway 95, and California SR 78 at an estimated 60 to 65 dBA L_{dn}. Areas in Blythe show existing noise levels ranging from 45 to 65 dBA L_{dn}. In addition to noise levels generated by the Interstate, highways, roadways, and local airports, construction projects such as the solar facility add to background noise levels along this section of the Proposed and Alternative segments.

3.12.4.3 Noise Sensitive Receptors

A noise-sensitive receptor is defined as a single home, mobile home, or building that could include a nursing home, church, hospital, school, or day care center. Residents or users of those buildings are not counted individually as receptors. Most of the noise-sensitive receptors in the study area are residential, which includes LTVAs or mobile home parks.

LTVAs and mobile home parks can vary substantially in the number of visitors present weekly, monthly, and seasonally. The La Posa LTVA, located just south of Quartzsite, is a campground managed by BLM; it is approximately 11,400 acres and provides camping facilities. The estimated length of stay at the La Posa LTVA is 2 weeks; however, there is also a dedicated LTVA community that stays for the winter season, extending from September 15 to April 15. Refer to Section 3.10 for a detailed discussion and estimate of visitors to these areas. Due to this fluctuation in the number of mobile homes and RVs present at any given time within the LTVA and mobile home parks in the study area, it is not possible to provide an accurate count of noise-sensitive receptors in some areas. Consequently, the number of receptors is variable. However, the sensitivity of these receptors should not be overlooked.

Other noise-sensitive receptors in the study area include a hotel and two institutional facilities. Receptors are considered institutional if they incorporate activities such as speech or meditation with primarily daytime and evening use (FTA 2006). The institutional receptors in the study area include the Church of Jesus Christ of Latter-day Saints in Quartzsite and the Quartzsite Alliance Church.

Wildlife areas and sacred tribal lands where overnight sleep occurs or where quiet conditions outdoors are essential for their intended function could be considered as sensitive but are not included in the receptor count. Generally, users of wildlife areas and sacred tribal land sites are transient and there is a lack of user data for these sites. For instance, the Kofa NWR does not have designated campgrounds. Campers are restricted to a maximum of 14-day stays and cannot camp within ¼ mile of water.

Wildlife can also be adversely affected by noise. Public and agency scoping comments noted that high construction noise levels may disrupt nesting desert birds and other noise-sensitive species. Scoping comments stated that noise may adversely affect desert bighorn sheep, including reduced reproductive success or abandonment of young sheep. One commenter suggested that the plains spadefoot toad can mistake OHV noise for rain, causing early emergence (Stantec 2016a).

A variety of wildlife and their habitat is present in the study area, including threatened and endangered species and their habitat. Existing noise levels in many areas with sensitive wildlife populations or wilderness designations along the route, such as the Kofa NWR, are relatively low, as shown in Figures 3.12-1f-h (Appendix 1). Threatened and endangered species and other noise-sensitive wildlife species that occur along the route segments are presented in Section 3.12.4.4. Refer to Section 3.5 for additional information regarding biological resources and characteristics of species present in the Project Area.

Noise-sensitive receptors were identified within the study areas encompassing the Proposed Action and Alternative Segments (HDR 2016b). In addition, receptors were only counted where there was an actual building or a semi-permanent mobile home in the case of permanent RV parks. Only 19 Alternative segments have noise-sensitive receptors, while 55 do not have any. Noise-sensitive receptors are described and presented in the following sections by their locations within geographic areas, east to west along the Proposed and Alternative segments. A table describing the noise-sensitive receptors, as well as predicted ambient noise levels, is provided only for those areas where receptors were identified (Table 3.12-8).

3.12.4.4 Zone-specific Noise Sensitive Receptors

East Plains and Kofa Zone

The following sections describe the portion of the Proposed and Alternative segments from the East Plains and Kofa Zone in Arizona. Because zero noise-sensitive receptors were identified in this area, tables of receptors are not provided for these segments, however, the general areas are described.

Proposed Action Segments p-01 through p-06
Segments p-01 through p-06 span the length of the Proposed Action route from Delaney Substation continuing to the west until just east of SR 95. These segments pass primarily through mountainous and undeveloped areas of Arizona and Segment p-06 passes through the Kofa NWR. The proposed Arizona Peace Trail intersects the western portion of Segment p-06. No noise-sensitive human receptors were identified within the noise study area for Segments p-01 through p-06.

Kofa NWR contains habitat for numerous wildlife species, including desert bighorn sheep and the endangered Sonoran pronghorn. Sonoran pronghorn have been introduced into King Valley on Kofa NWR. Most introduced pronghorn have remained in King Valley more than 10 miles south of the Proposed Action route, but some individuals have moved off the refuge and have been documented along or near the Proposed Action. Desert bighorn sheep live near these Proposed segments in the Bighorn Mountains (Segment p-01), Eagletail Mountains (Segment p-05), Dome Rock Mountains (Segment p-06), and Livingston Hills (Segment p-06), and important lambing areas are in the Dome Rock Mountains.

Alternative Segments d-01, i-01 through i-04, in-01, x-01 through x-04
Alternative Segment d-01 is south of the Proposed Action segments, while the other alternatives are north of the Proposed Action segments. The proposed Arizona Peace Trail intersects Segments x-04 and i-03. No human noise-sensitive receptors were identified along these Alternative segments. Segments in-01 and i-04 pass through or near desert bighorn sheep habitat, including important lambing areas in the Plomosa Mountains, and it is possible that Sonoran pronghorn are temporarily near some of these route segments. There are no noise-sensitive receptors along the alternative SCS 12kV distribution line.

Quartzsite Zone

The Proposed Action route is located south and well-removed from the vicinity of Quartzsite and the La Posa LTVA where high densities of noise-sensitive receptors are located. The Alternative segments in this same geographic area are in proximity or would bisect areas of noise-sensitive receptors. The Alternative segments are listed in Table 3.12-8, along with the number of noise-sensitive receptors within the designated study area of each segment.

Proposed Action Segments p-07 and p-08
Proposed Action Segments p-07 and p-08 connect with Segment p-06 at the east and continue further to the west through Arizona in undeveloped mountainous areas. No noise-sensitive receptors were identified within 2,000 feet of Segments p-07 or p-08.

Alternative Segments i-05, qn-01, qn-02, qs-01, qs-02, x-05, x-06, and x-07
Alternative Segments i-05, qn-01, qn-02, qs-01, qs-02, x-05, x-06, and x-07 are north of the Proposed Action Segments p-07 and p-08. Alternative Segment x-07 is located along SR 95 and

passes through the La Posa LTVA. Alternative Segment x-06 is adjacent to the LTVA. Various numbers of noise-sensitive receptors may be present within the LTVA at any given time during the year, because visitors may stay for up to 7 months and records of LTVA residents are kept only for a period of 2 weeks (HDR 2016b). Therefore, an exact number of noise-sensitive receptors cannot be provided. However, the La Posa LTVA attracts tens of thousands of visitors per year, particularly during the winter months. The other Alternative Segments in this area are located along I-10 and near Quartzsite. Alternative Segments qn-02, qs-01, and qs-02 in this area include nearby noise-sensitive receptors within the noise study area (Table 3.12-8). Many of the potential noise-sensitive receptors identified are residences in Quartzsite. The Church of Jesus Christ of Latter-day Saints, Quartzsite Alliance Church, RV and trailer parks, and a Super 8 Hotel are included among these receptors. Alternative Segments qs-01 and qs-02 pass through the very northern portion of the La Posa LTVA as well as Quartzsite and have the potential to effect thousands of noise-sensitive receptors.

Copper Bottom Zone

The CRIT Reservation is north of the Proposed Action route and the YPG is to the south. This area has limited land development but is crossed by the proposed Arizona Peace Trail. No noise-sensitive receptors were identified for the Proposed Action segments in this area, but the Alternative segments are listed in Table 3.12-8, along with the number of noise-sensitive receptors within the designated study area of each segment. Desert bighorn sheep and important sheep lambing areas are near Copper Bottom Pass and other portions of the Dome Rock Mountains near the Proposed Action route.

Proposed Action Segments p-09 through p-14
The proposed Arizona Peace Trail runs adjacent to parts of Segments p-12 and p-13. No noise-sensitive receptors were identified within the noise study area for Segments p-09 through p-14.

Alternative Segments cb-01 through cb-06, i-06, i-07, and x-08
Desert bighorn sheep and important sheep lambing are areas near Copper Bottom Pass and other portions of the Dome Rock Mountains near the Alternative segments. No noise-sensitive receptors were identified within the noise study area for Segments cb-01 through cb-06, i-06, i-07, and x-08.

Colorado River and California Zone

No noise-sensitive receptors were identified within the noise study area for Proposed Action Segment p-15e. The Proposed Action route includes eight noise-sensitive receptors along Segment p-15w, while the Alternative segments include numerous noise-sensitive receptors in the noise study area, particularly for Segments ca-01, ca-02, ca-05, x-10, and x-11. As with the Proposed Action segments in Arizona, the Proposed Action segments in California continue to follow existing utility corridors and would be co-located with an existing 500kV transmission facility. However, unlike La Paz County and western Maricopa County, the land character south of Blythe is predominantly rural residential areas and farmland. Both the city of Blythe and the change in land use and character mean that more public roads and noise-sensitive receptors are present. The Proposed and Alternative segments with noise-sensitive receptors within the designated study area are listed in Table 3.12-8.

Proposed Action Segments p-15e through p-18
Segments p-15w and p-16 pass through rural farmland and Segments p-17 and p-18 pass through uninhabited desert areas of California. Noise-sensitive receptors within the noise study area of the proposed transmission line include eight residential receptors in farming areas of Ripley, California, along Segment p-15w (Table 3.12-8). Desert tortoises, a threatened species, are uncommon along the Proposed Action route in this area, and endangered Yuma clapper rails could occasionally use canals and drains crossed by the Proposed Action route adjacent to farmland.

Alternative Segments ca-01, ca-02, ca-04 through ca-09, cb-10, i-08s, x-09 through x-19
Alternative Segments ca-01, ca-02, ca-04 through ca-07, ca-09, cb-10, i-08s, and x-09 through x-19 are located in California. Hundreds of sensitive receptors were identified adjacent to the Alternative Segments in this area. These receptors include residences in and around Blythe, as shown in Table 3.12-8.

3.12.4.5 Summary

Noise-sensitive receptors within the noise study area are summarized in Table 3.12-8. Proposed and Alternative segments where noise-sensitive receptors were not present are not included in the table. Sensitive receptors are located in proximity to one Proposed Action segment in California (Segment p-15w) and 16 Alternative segments, generally located in or near Quartzsite and Blythe. Sensitive wildlife is present along Segment p-06 where the Proposed Action crosses the Kofa NWR. Alternative segments running through or in proximity to Quartzsite and Blythe would affect more noise-sensitive receptors than segments in rural areas. Alternative segments with the highest numbers of noise-sensitive receptors in the noise study area include Segments qn-02, qs-01, qs-02, x-06, x-07, x-10, and ca-05. Alternative Segments ca-01, ca-02, and ca-05 are located near airports or airfields. Table 3.12-8 also lists existing ambient noise levels along each of the segments containing sensitive land uses.

Table 3.12-8 Noise-sensitive Segments within the Noise Study Area

ZONE	SEGMENT	NOISE-SENSITIVE RECEPTORS	LOCATION	EXISTING AMBIENT NOISE LEVELS (DBA LDN)
Quartzsite	qn-02	80	Residences and Quartzsite Alliance Church in Quartzsite, Arizona	55
Quartzsite	qs-01	251	Residences including La-Z Daze Trailer Park and Rice Ranch RV Park, the Church of Jesus Christ of Latter-day Saints, and LTVAs in Quartzsite, Arizona	60–65
Quartzsite	qs-02	54	Residences including Desert Gardens RV Park and a Super 8 Hotel, Arizona	60–65
Quartzsite	x-06	Variable; thousands per year	Adjacent to La Posa LTVA in Arizona; the number and location of potential noise-sensitive receptors changes over time	<45

ZONE	SEGMENT	NOISE-SENSITIVE RECEPTORS	LOCATION	EXISTING AMBIENT NOISE LEVELS (DBA LDN)
Quartzsite	x-07	Variable; thousands per year	Through La Posa LTVA south of Quartzsite, Arizona; the number and location of potential noise-sensitive receptors changes over time	50
Colorado River and California	p-15w	8	Rural residential area near Ripley, California	50
Colorado River and California	x-09	2	Residences along the Colorado River in Blythe, California	<45
Colorado River and California	x-10	63	Residences along the Colorado River in Blythe, California	<45
Colorado River and California	x-11	8	Residences along the Colorado River in Blythe, California	<45
Colorado River and California	x-12	2	Rural residential area southwest of Blythe, California	<45
Colorado River and California	x-13	2	Rural residential area near Blythe, California	<45
Colorado River and California	ca-01	8	Rural residential area south of Blythe, California	<45
Colorado River and California	ca-02	1	Rural residential area southwest of Blythe, California	<45
Colorado River and California	ca-05	21	Rural residential area near the Cyr airfield near Blythe, California	45–50
Colorado River and California	ca-06	3	Rural residential area near Blythe, California	<45

3.13 HAZARDS AND HAZARDOUS MATERIALS

3.13.1 Applicable Laws, Regulations, Policies, and Plans

The following sections summarize Federal, state, and local laws, regulations, and standards that govern hazardous materials across the study area, in addition to relevant BLM plans and policies. Sites where chemical releases to the environment have occurred and where cleanup is required are regulated by the EPA, California Environmental Protection Agency (CalEPA), and ADEQ.

Investigation and cleanup activities in soil, groundwater, and surface water are regulated under Arizona and California regulations, the Code of Federal Regulations (including 40 CFR 260–280), and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

3.13.1.1 Federal

The Resource Conservation and Recovery Act of 1976 (RCRA) gives the EPA the authority to control hazardous waste from "cradle to grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for managing non-hazardous solid wastes. The 1986 amendments to RCRA enabled the EPA to address environmental problems that could result from underground storage tanks (USTs) storing petroleum and other hazardous substances. In 1984, the Federal Hazardous and Solid Waste Amendments were added to RCRA and focused on waste minimization and phasing out land disposal of hazardous waste, as well as corrective action for releases. Some of the other mandates of this law include increased enforcement authority for the EPA, more-stringent hazardous waste management standards, and a comprehensive UST program.

CERCLA, commonly known as Superfund, was enacted by Congress in 1980 in response to unacceptable hazardous waste practices and management identified in the 1970s. Its purpose is to impose clean-up and reporting responsibilities on the private sector, as well as Federal facilities, by identifying where hazardous substances endanger public health or the environment as a result of leakage, spillage, or general mismanagement; taking action to remedy the releases; and seeking responsible parties to pay for the clean-up activities. It also addresses clean-up procedures at Superfund sites, which can be conducted only at sites listed on the EPA's National Priorities List. CERCLA and RCRA share authority with respect to USTs containing petroleum products and hazardous substances. CERCLA was amended by the Superfund Amendments and Reauthorization Act on October 17, 1986, which included provisions for clean-up standards and "community right to know" procedures.

BLM

The BLM engages in hazardous-material emergency response actions, site evaluations, and prioritization of cleanups in accordance with laws and regulations. This involves working with the EPA, state environmental quality departments, counties, and potentially responsible parties (both public and private) to fund and expedite the clean-up of hazardous sites. The BLM prioritizes sites that are an imminent threat to public health and safety, as well as those sites that are under a consent order and can therefore generate penalties and fines.

3.13.1.2 State

Arizona

ADEQ was established by the Arizona Environmental Quality Act in 1985 to serve as a separate, cabinet-level agency to administer Arizona's environmental protection programs. The same legislation established a comprehensive groundwater protection program and the Water Quality Assurance Revolving Fund to identify, assess, and remediate contaminated sites with the potential to affect public health or groundwater. The ADEQ supports a wide range of environmental programs that protect the quality of air, water, and land in Arizona. Four divisions (Air Quality, Water Quality, Tank Programs, and Waste Programs) carry out the ADEQ's core responsibilities:

pollution control; monitoring and assessment; compliance management; site cleanups; education, outreach, and financial assistance; and policy development.

California

CalEPA was created in 1991, which unified California's environmental authorities (for example, Air, Water, Toxic Substance Control, Pesticide Regulations, and Health Hazard offices) under one agency for the protection of human health and the environment and to ensure the coordinated deployment of state resources. Its mission is to restore, protect, and enhance the environment and to ensure public health, environmental quality, and economic vitality.

The California Hazardous Waste Control Law (HWCL) is administered by CalEPA to regulate hazardous wastes. While the HWCL is generally more stringent than RCRA, until the EPA approves the California program, both the state and Federal laws apply in California. The HWCL lists 791 chemicals and about 300 common materials that may be hazardous; establishes criteria for identifying, packaging, and labeling hazardous wastes; prescribes management controls; establishes permit requirements for treatment, storage, disposal, and transportation; and identifies some wastes that cannot be disposed of in landfills.

The California Department of Toxic Substance Control (DTSC) is a department of CalEPA and is the primary agency in California that regulates hazardous waste, administers clean-ups of existing contamination, and looks for ways to reduce the hazardous waste produced in California. The DTSC regulates hazardous waste in California primarily under the authority of RCRA and the California Health and Safety Code. Other laws that affect hazardous waste are specific to handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning.

The California Occupational Safety and Health Administration is the primary agency responsible for worker safety in the handling and use of chemicals in the workplace. Its standards are generally more stringent than Federal regulations. Employers are required to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR 337–340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings.

3.13.1.3 Local

La Paz County

The La Paz County Office of Emergency Management responds to hazardous material spills throughout the County and ensures cleanup compliance as directed by the Arizona Department of Emergency and Military Affairs and the ADEQ.

Maricopa County

The Water and Waste Management Division of the Maricopa County Environmental Services Department has a wide range of environmental responsibilities for preventing environmental contamination, including overseeing the investigation of illegal dumping in incorporated areas, overseeing permits on refuse haulers and non-hazardous liquid waste haulers, and instituting procedures to minimize environmental impacts and to reduce polluted stormwater runoff. The Water and Waste Management Division uses the Maricopa County Health Code and the AAC to provide for the needed inspections and approvals related to these functions.

Riverside County

The Riverside County Department of Environmental Health Hazardous Materials Branch is responsible for overseeing hazardous waste minimization, training, permitting, and inspection through several programs. County programs regulate USTs and monitor remediation of local leaking underground storage tank (LUST) sites. Branch personnel work with businesses to reduce the amount of hazardous waste produced by way of education and technical assistance. In addition, the branch works with the Riverside County Fire Department to respond to hazardous material incidents. Hazardous materials are addressed in the Riverside County General Plan, Chapter 6, which provides for enforcement of Federal, state, and local laws.

3.13.2 Study Area

The hazardous materials study area is defined as a 1-mile wide corridor encompassing the Proposed and Alternative segments, which encompasses the extent of potential new Project-related access roads and any other construction-related disturbance areas.

This assessment provides an overview of existing conditions within the study area and a basis for deciding whether additional analysis may be needed to determine hazardous material and waste impacts for the Project. It does not specifically identify the presence or absence of hazardous substances or contamination within the study area but provides information on known potential hazards and hazardous waste sites as identified through a screening-level desktop review of existing databases and aerial imagery, supplemented by limited reconnaissance.

Environmental Data Resources Inc. (EDR) is a firm that performs searches of state and Federal databases to identify known hazardous materials sites of concern. On July 7, 2016, EDR completed a search for and reported on government records for contaminated sites, registered facilities, and storage tanks in the vicinity of the study area. EDR also maintains and provides proprietary records of historic high-risk properties such as former gas stations and dry-cleaning operations. Over 50 databases were included in the search and report, including the EPA Hazardous Materials Incident Report System, the California “Cortese” Hazardous Waste and Substances Sites List, and the Federal listing of Unexploded Ordnance Sites, among numerous others. The EDR report prepared for this Project (Appendix A in HDR 2016c), provides such listings within for the 1-mile corridor encompassing the Proposed and Alternative segments. The EDR report addresses both mapped sites and unmapped “orphan” sites; both are included in reporting tables below.

The EDR report was reviewed and individual sites were confirmed using address and mapping information and current aerial imagery in a GIS environment. GIS was also used to approximate distances to segments and to model local topography, to infer the potential for and direction of surface water flow at each site.

Remote reconnaissance of the study area was conducted through the examination of current GIS-based aerial photography, supplemented by Google Earth and Google Street View searches when supported by available photo resolution. Historic aerial photos were not examined, as current aerial photography was judged to provide the best representation of potential environmental risk to existing resources and Project workers. Subsequent investigation of sites with the potential for higher environmental concern may be warranted when a final route is selected, using historical aerial photos and agency records as data sources. A protocol for researching and mitigating sites identified as having hazardous materials has been developed (Section 4.13, Hazardous Materials Mitigation Sequence).

Additional available online information related to the study area was reviewed on August 3, 2016, through searches of the ADEQ, the DTSC's EnviroStor searchable database (DTSC 2016), the California State Water Resources Control Board's (SWRCB) GeoTracker search tool (California SWCRB 2016), and the EPA databases. These searches provided additional indications of hazardous materials or waste documented as present or possibly present within the study area.

Summary tables of database records are presented in each subsection below. Sites of higher potential that warrant additional investigation once a construction footprint is available for analysis, or those with higher potential to warrant agency and/or stakeholder coordination to ensure appropriate mitigation measures, are indicated with shading for attention. Additionally, some sites are identified as presenting a lower potential for environmental concern. This reflects professional judgment that the hazard presented in the government record was unlikely to be impacted by the Project, or that the reasonable search distance under American Society for Testing and Materials (ASTM) 1527-13 (*Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*) was exceeded by the record's distance to the respective segment. Once a preferred route is selected, or a construction footprint (including staging areas and haul routes) is identified, additional analysis would identify where soil disturbances and work areas may disturb sites with recognized environmental conditions and whether mitigation measures would be needed.

Route segments and individual sites are described below, including tables describing potential environmental concern, distance to segment, and overall risk assessment for each site. The report tables reference the corresponding site number and map in the EDR report (Appendix A in HDR 2016c). Assessments presented in these tables are based on screening-level data only and should be considered preliminary; additional investigations may be warranted based on Project design considerations, subsequent input from stakeholders, or additional site-specific assessments.

3.13.3 Existing Conditions

3.13.3.1 General Project Area

Identified sites of potential environmental and human health concerns due to the possible presence of hazardous materials or waste include utility infrastructure, above ground storage tanks (ASTs) and USTs, historical mining sites, past and present agricultural use, and industrial/commercial facilities known to store, generate, transport, or dispose of hazardous materials. Potential for concern is identified to the degree possible using available data within the records, understanding of the regulating and/or recording agency, and the type of industry or business that the record represents.

ADEQ sites of interest typically refer to facilities that engage in practices that may lead to incidents under ADEQ regulation. For example, there are multiple RV campgrounds that are identified in the government records. RV campground areas often offer locations for visitors to fill their vehicles with potable water and dump greywater or blackwater, which may lead to leaks or spills of septage.

Tables in the following sections present database records and observations from aerial imagery review, along with estimated distances from segments. EDR report records with geographic information are identified symbolically on Figures 3.13-1 through 3.13-4 (Appendix 1), but are not labeled individually because of the large extent of the study area. Site record numbers are listed in the tables and correspond to results within the EDR report (HDR 2016c, Appendix A).

Based on a Federal and state database review, no mapped Superfund (CERCLA/SEMS/SEMS-ARCHIVE) sites or sites on the NPL exist within the study area.

Many segments of both the Proposed and Alternative segments follow corridors shared by subsurface natural gas pipelines. The Project would maintain a 300-foot distance between this Project's physical components (e.g., transmission line poles) and any natural gas pipeline. There is the potential for ground-disturbing activities to encounter previously unreported or undetected petroleum-hydrocarbon-contaminated soils, and the use of heavy construction equipment and earth-moving activities around the subsurface pipelines could interrupt operations or cause release of a hazardous substance to the environment.

The proposed Project would traverse lands classified under a variety of land uses, including open space, recreation and preserve, agricultural, commercial, military, and rural and suburban residential uses. Current or historical land use activities provide indicators of potential hazardous materials use and storage. Agricultural lands, both active and inactive, are within and adjacent to the Proposed and Alternative segments. There is potential for encountering contaminated soils in these areas based on the storage, transport, and use of pesticides and herbicides in the study area.

Generally, the number of identified sites of concern increases in the area of Blythe because of agricultural operations requiring pesticides, herbicides, and fuels used for aircraft, industrial equipment, and vehicles.

3.13.3.2 Zone-Specific Conditions

East Plains and Kofa Zone

The Proposed Action Segments p-01 to p-06 cross mainly open lands within designated utility corridors and have a generally low potential to encounter contaminated soils. However, the Proposed Action both crosses and parallels a subsurface natural gas pipeline and there is some potential for worker safety hazards and encountering contaminated soils.

Alternative segments traverse agricultural lands and follow the I-10 corridor, which contains commercial and industrial sites. Portions parallel a subsurface natural gas pipeline. Research identified multiple government database listings of contaminated sites, registered facilities, and storage tanks in approximately 10 locations across Alternative Segments d-01, i-02, i-03, and i-04. No sites of concern were identified within 0.5 mile of the other segments. Potential soil contamination may be present in agricultural soils from past and present pesticide and herbicide use. Areas near industrial and commercial sites, such as the Harquahala Substation industrial site and the Tomahawk Travel Plaza, may contain petroleum-contaminated soils.

Proposed Action Segments p-01 through p-06

The predominant land use occurring within and adjacent to Proposed Action Segments p-01 through p-06 is undeveloped. Most of this segment is located within a designated utility corridor except for a portion in far western Maricopa County and eastern La Paz County where it connects to Segment p-02 and re-enters the utility corridor. While the Proposed Action route would traverse a few areas designated for rural residential development within Maricopa and La Paz Counties, there is little to no development in these areas. The segment crosses numerous small rural paved and unpaved roads and I-10.

Based on the land uses present, in particular the lack of commercial development and industrial uses other than existing utilities, Segments p-01 to p-06 have a generally low potential to encounter contaminated soils; however, the Proposed Action route does cross and would be located parallel to a subsurface natural gas pipeline. No records indicate any known contamination associated with the pipeline, however the proximity of pressurized natural gas to the Proposed Action route is a recognized environmental condition. As a vapor, natural gas presents little risk of contamination to soil and groundwater, but it is highly flammable and may present public and worker safety concerns. Table 3.13-1 provides government database listings within 0.5 mile of these Proposed Action Segments.

Table 3.13-1 Database Listings within One-Mile Wide Study Area of Segments p-01 through p-06

SEGMENT	SITE NAME, RELEVANT DATABASE, AND LOCATION	POTENTIAL ENVIRONMENTAL CONCERN
p-01	**Delaney Switchyard**, EDR Map ID 128-107 AZ Dry Wells 45550 W. Salome Highway	Stormwater disposal site, regulated by the ADEQ
p-02	**Vidler Recharge Facility** – Harquahala Basin, EDR Map ID 103-56 EMAP Centennial, AZ	Groundwater recharge project, storage of excess water from CAP
p-03	None listed	—
p-04	**El Paso Natural Gas Company, Wenden Compressor Station,** EDR Map ID 113-86 FINDS (7 listings) 3 miles south of milepost 63 on I-10, 33 miles west of Tonopah	Natural gas company and facilities; turbines compress gas for interstate pipeline; subsurface pipelines
p-05	None listed	—
p-06	**Arizona Capacitors**, EDR Map ID 122-81 FINDS, ECHO, EMAP 8 miles south of Interstate 10 at exit 45	Identified as an inactive remediation site and facility that generates, transports, stores, or disposes of hazardous wastes

Note: EDR Map ID lists site number and corresponding map number (“site”- “map”) as labeled in HDR 2016c Ten West Link 500kV Transmission Line Project Hazardous Materials Baseline Technical Report.
El Paso Natural Gas facilities are now owned by Kinder Morgan.
Shading indicates sites of potentially higher environmental concern that may that may warrant additional investigation and/or additional stakeholder consultation.

Alternative Segments d-01, i-01 through i-04, in-01, x-01 through x-04

<u>*Segment d-01*</u>

West of the county line, Segment d-01 enters an existing utility corridor and parallels the Kinder Morgan natural gas pipeline until it intersects with Segment p-03. No records indicate any known contamination associated with the pipeline, however, the proximity of pressurized natural gas to the segment is a recognized environmental condition.

Research identified multiple government database sites associated with the Harquahala Substation industrial site, located about 500 feet south of Segment d-01. The existing power station uses natural gas, contains subsurface gas lines, and has flammable wastes such as solvents present. This location also contains 11 listings in both the FINDS and ECHO databases, and one listing in the US AIRS database as a stationary source of air pollution. Many of these listings identify entities that are no longer in business. This location presents the potential to encounter contaminated soils (Table 3.13-2).

Agricultural lands on the eastern side of Segment d-01 extend along 4.5 miles of the alignment and may have residual pesticides and herbicides in the soil.

<u>*Segments i-01 through i-04*</u>

Alternative Segments i-01 through i-04 follow the southern side of I-10 in an existing utility corridor through private undeveloped and agricultural lands and BLM-administered land. These segments cross smaller roads and the CAP canal in multiple locations. A highway travel plaza with USTs is present on the northern side. There may be a potential to encounter contaminated soils from past leaks, unreported highway incidents, or unknown leaks from USTs related to this travel plaza. Segment i-04 traverses an area historically used for gold mining. No identified contaminated sites are in the Segment i-04 area; however, two mine locations are identified as ADEQ sites of interest. In general, past, and present mining activities included the storage and use of chemicals.

In general, the lack of development and the few identified government database sites within Segments i-01 to i-05 result in a low potential to encounter contaminated soils.

<u>*Segment in-01*</u>

No identified contaminated sites are in the Segment in-01 area; however, a landfill is present and two mine locations are identified as ADEQ sites of interest. The mining sites are listed as non-coal facilities, but no other information on commodity type was listed in available databases; review of aerial photos showed no indications of open pit mines in the area. In general, past and present mining activities included the storage and use of chemicals. Overall, the lack of development and the few identified government database sites within Segment in-01 study area result in a low potential to encounter hazardous materials or waste.

<u>*Segments x-01 through x-04*</u>

No database results were identified within 0.5 mile of these Alternative segments. Potential for encountering hazardous materials or waste is low.

Table 3.13-2 Database Listings within One-Mile Wide Study Area of Alternative Segments d-01, i-01 through i-04, in-01, x-01 through x-04

SEGMENT	SITE NAME, RELEVANT DATABASE, AND LOCATION	POTENTIAL ENVIRONMENTAL CONCERN
d-1	**Harquahala Power Plant Site,** EDR Map ID 129-105 FINDS, 11 listings; ECHO, 11 listings; US AIRS; AZ AST, 2 listings; AZ Manifest 2530 N. 491st Ave, Tonopah, AZ	Gas fired electric generating plant; potential for subsurface gas lines; aboveground tanks on site
	Delaney Switchyard, EDR Map ID 128-107 AZ Dry Wells 45550 W. Salome Highway	Stormwater disposal site, regulated by the ADEQ
i-01	None listed	—
i-02	**Incident PSC Industrial**, EDR Map ID 65-53 FINDS, EMAP, ECHO Interstate 10 westbound, milepost 57.5, Quartzsite	Generates, stores, or transports hazardous materials and wastes
	Great West Casualty, EDR Map ID 67-54 EMAP Interstate 10 in Centennial	Inactive site of interest with the ADEQ. *Low potential for concern**
i-03	**CAP – Little Harquahala Plant,** EDR Map ID 77-52 FINDS, ECHO Interstate 10 and Hovatter Road, New Hope	Central water conveyance plant; small-quantity generator of hazardous waste. *Low potential for concern**
	Desert Gold RV Park – Phase 3, EDR Map ID 31-27 FINDS, ECHO 46628 E. US 60-70	ADEQ wastewater monitoring point. *Low potential for concern**
i-03 (cont.)	**Tomahawk Truck Plaza,** EDR Map ID 27-27 FINDS, LUST, AZ UST, AZ Enforcement, AZ Aquifer, 12 listings	Gas station with recorded fuel release; potential for unreported or future contamination by petroleum materials; tanks on site
	Potable Reject Water/Sonic Flume Chamber/Water Supply Well, EDR Map ID 28-27 EMAP	ADEQ wastewater monitoring point. *Low potential for concern**
i-04	**Plomosa Placers**, EDR Map ID 1-5,6 US MINES	Current and former gold mining location; potential for unreported chemical releases
	Pioneer Landscaping Materials, Inc., EDR Map ID 2-6	Abandoned mine with past citations; potential for unreported chemical release

SEGMENT	SITE NAME, RELEVANT DATABASE, AND LOCATION	POTENTIAL ENVIRONMENTAL CONCERN
in-01	**Quartzsite/Ehrenberg/Bouse Landfill** EDR Map ID 3-6 Interstate 10 and Highway 60	Solid Waste Landfill, may indicate presence of undocumented pollutants
	Plomosa Placers, EDR Map ID 1-5,6 US MINES	Current and former gold mining location; potential for unreported chemical releases
	Pioneer Landscaping Materials, Inc., EDR Map ID 2-6	Abandoned mine with past citations; potential for unreported chemical release
x-01	None listed	—
x-02a/b	None listed	—
x-03	None listed	—
x-04	None listed	—

Note: EDR Map ID lists site number and corresponding map number ("site"- "map") as labeled in HDR 2016c, Ten West Link 500kV Transmission Line Project Hazardous Materials Baseline Technical Report A.
* Exceeds minimum search radius for RCRA generators, or registered tanks under ASTM 1527-13.
Shading indicates sites of potentially higher environmental concern that may warrant additional investigation and/or additional stakeholder consultation.

Quartzsite Zone

Proposed Action Segments p-07 and p-08 (Table 3.13-3) parallel the Kinder Morgan (formerly El Paso) natural gas pipeline along the entire length of the segments.

Alternative segments in the Quartzsite area are routed to avoid developed areas. No database listings were identified within a 0.5-mile radius of Segments qn-01 and qn-02. Seventeen database listings were identified near qs-01 and qs-02 for various lodging and RV park locations for potential spills. Three database listings were identified in x-07, including two mining sites and a long-term stay RV campground. Potential contamination may exist associated with the underground pipeline and storage tanks.

Proposed Action Segments p-07 and p-08

Proposed Action Segments p-07 and p-08 traverse BLM-administered land within a designated utility corridor west of the Kofa NWR and north of the YPG. The area is characterized by wide, sparsely vegetated plains. The segments parallel the Kinder Morgan natural gas pipeline. No records indicate any known contamination associated with the pipeline, however, the proximity of pressurized natural gas to the Proposed Action is a recognized environmental condition. Segment p-08 crosses SR 95.

The presence of a subsurface gas pipeline and a nearby compressor station constitutes a potential hazard. The sites listed in Table 3.13-3 identify government database records within 0.5 mile of Segments p-07 and p-08. Figure 3.13-2 (Appendix 1) identifies the location of the database listings in the Quartzsite area.

Table 3.13-3 Database Listings within One-Mile Wide Study Area of Segments p-07 and p-08

SEGMENT	SITE NAME, RELEVANT DATABASE, AND LOCATION	POTENTIAL ENVIRONMENTAL CONCERN
p-07	**El Paso Natural Gas Company**, Castle Dome Compressor Station, EDR Map ID 116-73 FINDS 1.5 miles south of Quartzsite	Natural gas distribution facility; potential for subsurface gas lines
p-08	**Compartment A UST**, EDR Map ID 116-73 EMAP 0.3 mile east of US Route 95, 8 miles south of Interstate 10 and US Route 95 intersection	Potential soil contamination by petroleum hydrocarbons. *Low potential for concern**

Notes: EDR Map ID lists site number and corresponding map number (“site”- “map”) as labeled in HDR 2016c Ten West Link 500kV Transmission Line Project Hazardous Materials Baseline Technical Report.
El Paso Natural Gas facilities are now owned by Kinder Morgan.
* Exceeds minimum search radius for RCRA generators, or registered tanks under ASTM 1527-13.
Shading indicates sites of potentially higher environmental concern that may that may warrant additional investigation and/or additional stakeholder consultation.

Alternative Segments i-05, qn-01 and qn-02, qs-01 and qs-02, x-05, x-06, and x-07

Table 3.13-4 lists sites from regulatory databases for these segments. No database listings were identified within a 0.5-mile radius of Segments qn-01 and qn-02. Several database listings were identified along Segments qs-01 and qs-02 for various lodging and RV park locations for potential spills. Three database listings were identified in the Segment x-07 study area, including two mining sites and a long-term-stay RV campground. The mining sites are listed as non-coal facilities, but no other information on commodity type was listed in available databases; review of aerial photos showed no indications of open pit mines in the area. RV parks and lodging may pose concerns due to the potential for septage leakage into soil from RV waste. Minor petroleum leaks are possible as well due to the presence of motor vehicles, but the available data do not indicate UST or registered tanks at these sites.

No records indicate any known contamination associated with the natural gas pipeline, however, the proximity of pressurized natural gas to the route segment is a recognized environmental condition. Potential worker safety hazards may exist associated with the underground pipeline.

Table 3.13-4 Database Listings within One-Mile Wide Study Area of Alternative Segments i-05, qn-01, qn-02, qs-01, qs-02, x-05, x-06, and x-07

SEGMENT	SITE NAME, RELEVANT DATABASE, AND LOCATION	POTENTIAL ENVIRONMENTAL CONCERN
i-05	None listed	—
qn-01	None listed	—
qn-02	None listed	—
qs-01	**Staker Paving,** EDR Map ID 11-3 FINDS, ECHO, RCRA NonGen/NLR 725 N. Central Ave., Quartzsite	Facility stores and uses hazardous materials (asphalt, petroleum products)
	Quartzsite Elementary School, EDR Map ID 8-3 FINDS 930 Quail Trail, Quartzsite	Unknown; place of interest to the ADEQ. *Low potential for concern**
	Goldstar Mobile RV Park, EDR Map ID 4-3 FINDS, ECHO, AZ Enforcement, AZ WWFAC 275 Riggles Road, Quartzsite, AZ	Facility information tracked by the ADEQ. *Low potential for concern**
	LA-Z-DAZE Trailer Park, EDR Map ID 7-3 FINDS, ECHO, AZ Enforcement 410 S. Riggles Road, Quartzsite	Known past sewage spill, remains place of interest to the ADEQ. *Low potential for concern**
	Kuehn St. WL Ext, SR 95, E to Riggles Rd., EDR Map ID 9-3 FINDS, ECHO, AZ EMAP	Drinking water test site, place of interest to the ADEQ. *Low potential for concern**
	Quartzsite Sleep Inn, EDR Map ID 9-3 250 E. Kuehn St.	Place of interest to the ADEQ. *Low potential for concern**
	Clouds Trailer Park, EDR Map ID 5-3 AZ EMAP, AZ Enforcement 300 S. Riggles Ave, Quartzsite, AZ	Unknown; place of interest to the ADEQ. *Low potential for concern**
	Desert Edge RV Park, EDR Map ID 8-3 FINDS, ECHO, AZ EMAP 855 Rogers Place, Quartzsite	Unknown; place of interest to the ADEQ. *Low potential for concern**
	Winter Haven RV Park, EDR Map ID 7-3 FINDS, ECHO, AZ EMAP 990 E. Rodgers Place, Quartzsite	Unknown; place of interest to the ADEQ. *Low potential for concern**
qs-02	**Dome Rock Industries/US Fuel Oil LLC**, EDR Map ID 18-18 RCRA Nongen/NPL, FINDS, ECHO, AZ Spills, AZ Enforcement, AZ EMAP 3125 W. Dome Rock Rd., Quartzsite	Manufacturing plant; small-quantity generator: lead, cadmium, selenium; bulk fuel storage; past facility violations
	Best Western Hotel, EDR Map ID 14-19 FINDS, ECHO, AZ EMAP Quartzsite	Unknown; place of interest to the ADEQ. *Low potential for concern**
	Hassler S RV Park, EDR Map ID 13-3 FINDS, ECHO, AZ EMAP 616 Granada Dr., Quartzsite	Unknown; place of interest to the ADEQ. *Low potential for concern**

SEGMENT	SITE NAME, RELEVANT DATABASE, AND LOCATION	POTENTIAL ENVIRONMENTAL CONCERN
qs-02 continued	**Dome Rock Road West Water Pipeline Extension**, EDR Map ID 18-18 FINDS, ECHO, AZ EMAP Dome Rock Rd., Quartzsite	Unknown; place of interest to the ADEQ. *Low potential for concern**
	Desert Gardens RV Park, EDR Map ID 13-2, 18 FINDS, ECHO, AZ EMAP, AZ Enforcement 1240 S. Acacia St., Quartzsite	Open site, violations (of unknown nature)
	Dome Rock BLM Campground, EDR Map ID 15-18 FINDS, ECHO, AZ EMAP Quartzsite	Unknown; place of interest to the ADEQ. *Low potential for concern**
	Resource Processing, Inc., EDR Map ID 17-18 AZ EMAP Quartzsite	Inactive mine, possible unreported spills
	Western Arizona Materials Recovery Facility, EDR Map ID 18-18 FINDS, ECHO, AZ EMAP 3215 W. Dome Rock Rd.	Waste transfer station
x-05	None listed	—
x-06	**Compartment A UST**, EDR Map ID 116-73 EMAP 0.3 mile east of US Route 95, 8 miles south of Interstate 10 and US Route 95 intersection	Potential soil contamination by petroleum hydrocarbons. *Low potential for concern**
x-07	**L&B Partners**, EDR Map ID 19-19 US MINES Yuma	Non-coal mine, potential for soil contamination
	Compartment A UST, EDR Map ID 116-73 EMAP 0.3 mile east of US Route 95, 8 miles south of Interstate 10 and US Route 95 intersection	Potential soil contamination by petroleum hydrocarbons. *Low potential for concern**
	Quartzsite Mining Company, EDR Map ID 19-19 US MINES Yuma	Non-coal mine, potential for soil contamination
	La Posa Long Term Visitor Area, EDR Map ID 21-19 FINDS, ECHO, AZ EMAP Quartzsite	RV campground; place of interest for the ADEQ. *Low potential for concern**

Note: EDR Map ID lists site number and corresponding map number (“site”- “map”) as labeled in HDR 2016c Ten West Link 500kV Transmission Line Project Hazardous Materials Baseline Technical Report.
* Exceeds minimum search radius for RCRA generators, or registered tanks under ASTM 1527-13.
Shading indicates sites of potentially higher environmental concern that may that may warrant additional investigation and/or additional stakeholder consultation.

<u>Copper Bottom Zone</u>

No sites were identified in Proposed Action Segments p-10 through p-14 (Table 3.13-5). The potential for encountering soil contamination is low.

Alternative Segments cb-01 through cb-06 traverse BLM-administered land in the Copper Bottom Pass area. No site records were identified within 0.5 mile of cb-01 through cb-06 (Table 3.13-6). Segment cb-03 is in the vicinity of a subsurface natural gas pipeline.

Segment i-08s is adjacent to a Kinder Morgan (formerly El Paso) natural gas pipeline compressor station facility, traverses a larger natural gas complex, and crosses adjacent to 0.5 mile of agricultural lands along the Arizona side of the Colorado River. Segments i-06, i-07, and i-08s parallel subsurface natural gas pipeline facilities. There is the potential to encounter soils contaminated with agricultural pesticides or petroleum hydrocarbons along these Alternative Segments.

The potential for encountering contaminated soils is low along alternative Segment x-08 as no database records were identified in its vicinity.

Proposed Action Segments p-09 through p-14
Within the Copper Bottom Pass area, Segment p-09 follows an existing utility corridor through a corner and adjacent to the YPG, a military testing facility. Segment p-09 crosses 0.15 mile into the Cibola Region of the YPG test range. The YPG is a large complex (1,300 square miles) used for testing military equipment, including munitions and artillery systems. The YPG is not on the NPL, but regulatory oversight is provided by the ADEQ under a US Department of Defense Installation Restoration Program. Contaminants of concern at the site include petroleum hydrocarbons, VOCs, semi-VOCs, metals, propellants, explosives, pyrotechnics, chemical warfare agents, and munitions. There could also be the potential for unexploded ordnance. Activities within those segments should be coordinated with the ADEQ. Most of the sites containing hazardous materials or waste are fenced, and public access is prohibited (ADEQ 2016a). The proximity to the YPG constitutes a potential hazard.

No sites were identified in Proposed Action Segments p-10 through p-14 (Table 3.13-5). Figure 3.13-3 (Appendix 1) identifies the location of the database listings in the Copper Bottom Pass area.

Table 3.13-5 Database Listings within One-Mile Wide Study Area of Segments p-10 through p-14

SEGMENT	SITE NAME	POTENTIAL ENVIRONMENTAL CONCERN
p-09	**US Army Yuma Proving Ground,** EDR Map ID 0-68, 69, 70, 71, 72 AZ SPL	Potential contaminants of concern include petroleum hydrocarbons, volatile organic compounds, semivolatile organic compounds, metals, propellants, explosives, pyrotechnics, chemical warfare agents, and munitions
p-10	None listed	—
p-11	None listed	—
p-12	None listed	—

SEGMENT	SITE NAME	POTENTIAL ENVIRONMENTAL CONCERN
p-13	None listed	—
p-14	None listed	—

Notes: EDR Map ID lists site number and corresponding map number ("site"- "map") as labeled in HDR 2016c Ten West Link 500kV Transmission Line Project Hazardous Materials Baseline Technical Report.

Alternative Segments cb-01 through cb-06, i-06, i-07, and x-08

Segments cb-01 through cb-06

Segments cb-01 through cb-06 are various alternative alignments that cross BLM-administered land in the Copper Bottom Pass area. Segment cb-03, which parallels Segment p-11, crosses private lands within La Paz County northeast but adjacent to the Kinder Morgan natural gas pipeline.

No sites were identified within 0.5 mile of cb-01 through cb-06 (Table 3.13-6). There is the potential for worker safety concerns along cb-03 because of the presence of subsurface pipelines.

Segments i-06, i-07, and x-08

Segments i-06 and i-07 parallel subsurface natural gas pipeline facilities. No records indicate any known contamination associated with the pipeline, however, the proximity of pressurized natural gas to the route segments is a recognized environmental condition. Additionally, there is the potential to encounter residual pesticides and herbicides in the soil along these Alternative Segments where they traverse agricultural properties.

Segment x-08 branches off from Segment p-12 to connect near the I-10 alternative corridor at Segments i-06 and i-07. No database site listings were identified within 0.5 mile of Segment x-08. The potential for encountering contaminated soils is low. See Table 3.13-6 for details.

Table 3.13-6 Database Listings within One-Mile Wide Study Area of Segments cb-01 through cb-06, i-06, i-07, and x-08

SEGMENT	SITE NAME, RELEVANT DATABASE, AND LOCATION	POTENTIAL ENVIRONMENTAL CONCERN
cb-01	None listed	—
cb-02	None listed	—
cb-03	None listed	—
cb-04	None listed	—
cb-05	None listed	—
cb-06	None listed	—

SEGMENT	SITE NAME, RELEVANT DATABASE, AND LOCATION	POTENTIAL ENVIRONMENTAL CONCERN
i-06	**Quartzsite I-10 Median**, EDR MAP ID 23-16 FINDS, ECHO, AZ EMAP Ehrenberg	Emergency response (unknown nature) location. *Low potential for concern**
	ADOT – Ehrenberg Maintenance/Vehicle Service, EDR MAP ID 30-15 FINDS, ECHO Ehrenberg	Potential for spill
	ADOT Ehrenberg Rest Area Eastbound, EDR MAP ID 32-15 FINDS, ECHO Eastbound Interstate 10, Ehrenberg	Unknown; place of interest for the ADEQ. *Low potential for concern**
i-07	ADOT Ehrenberg Motor Vehicle Inspection Station, EDR MAP ID 38-14 FINDS, ECHO, AZ EMAP	Unknown; place of interest for the ADEQ. *Low potential for concern**
	Ehrenberg Pit, EDR MAP ID 38-14 FINDS, ECHO, AZ EMAP, AZ Enforcement, AZ WWFAC Ehrenberg	Sand and gravel operations; storage of hazardous materials.
	Sunmart Travel Center, EDR MAP ID 29-15 FINDS, ECHO, LUST, AZ UST, AZ EMAP, AZ Enforcement, AZ WWFAC 18221 Tom Wells Rd., Ehrenberg	Gas station; bulk fuel and tanks on site; subsurface pipes; previous fuel spills/leaking tanks; potential for gasoline and diesel releases or residual contamination

Notes: EDR Map ID lists site number and corresponding map number (“site”- “map”) as labeled in HDR 2016c Ten West Link 500kV Transmission Line Project Hazardous Materials Baseline Technical Report.
El Paso Natural Gas facilities are now owned by Kinder Morgan.
Shading indicates sites of potentially higher environmental concern that may that may warrant additional investigation and/or additional stakeholder consultation.

Colorado River and California Zone

Proposed Action Segments p-15e through p-18 traverse BLM and private lands from the Arizona-California border to the Colorado River Substation. Approximately 10.5 miles of Segments p-15w and p-16 are actively used for agricultural purposes. No sites were identified in the government database research. Potential soil contamination from pesticides and herbicides may exist from agricultural applications.

Alternative Segments ca-01, ca-02, ca-04 through ca-07, ca-09, cb-10, i-08s, x-09 through x-16, and x-19 also traverse BLM and private lands from the state border to the Colorado River Substation. In addition to active and inactive agricultural lands, segments cross residential and industrial/commercial properties such as gas stations, agricultural/pesticide operations, and auto servicing businesses. The potential exists for encountering soils contaminated with gasoline or other hydrocarbons on or near this type of site.

Segment i-08s is adjacent to a Kinder Morgan (formerly El Paso) natural gas pipeline compressor station facility, traverses a larger natural gas complex, and crosses adjacent to 0.5 mile of agricultural lands along the Arizona side of the Colorado River.

The City of Blythe Regional Wastewater Treatment Plant has a long-recorded history of receipt of noncompliance letters, including water quality and reporting violations. Additional agency coordination may be of benefit, as data were not clear on the nature or extent of the contamination.

Proposed Action Segments p-15e through p-18
No sites were identified in the government database research (Table 3.13-7). Potential soil contamination from pesticides and herbicides may exist from agricultural applications. Figure 3.13-4 (Appendix 1) identifies the location of the database listings in the Colorado River and California Zone study area.

Table 3.13-7 Database Listings within One-Mile Wide Study Area of Segments p-15e through p-18

SEGMENT	SITE NAME	POTENTIAL ENVIRONMENTAL CONCERN
Arizona		
p-15e	None listed	—
California		
p-15w	None listed	—
p-16	None listed	—
p-17	None listed	—
p-18	None listed	—

Alternative Segments ca-01, ca-02, ca-04 through ca-07, ca-09, cb-10, i-08s, x-09 through x-13, x-15, x-16, and x-19
These Alternative Segments traverse BLM and private lands. Segments ca-01, ca-02, ca-04, ca-05, ca-06, and x-09 through x-13 cross active and inactive agricultural lands. Residential and commercial operations such as gas stations, agricultural/pesticide operations, and auto servicing businesses are within the study area. There is the potential to encounter residual pesticides and herbicides in soils, as well as petroleum hydrocarbon contamination from commercial businesses. Segment i-08s parallels subsurface natural gas pipeline facilities. There is the potential to encounter soils contaminated with pesticides or petroleum hydrocarbons along this alternative segment.

The City of Blythe Regional Wastewater Treatment Plant is located along Segment ca-05; because of the history of non-compliance with reporting, the potential exists for contaminated soils.

The sites listed in Table 3.13-8 were identified for Alternative Segments in the Blythe to Colorado River Substation area.

Table 3.13-8 Database Listings within One-Mile Wide Study Area of Alternative Segments ca-01, ca-04 through ca-07, ca-09, cb-10, i-08s, x-09 through x-13, x-15, x-16, and x-19

SEGMENT	SITE NAME, RELEVANT DATABASE, AND LOCATION	POTENTIAL ENVIRONMENTAL CONCERN
Arizona		
cb-10	None listed	—
i-08s	**El Paso Natural Gas – Baja Compressor Station**, EDR Map ID 63, 69-36 AZ EMAP, AZ Enforcement, US AIRS 50650 Colorado River Rd., Ehrenberg AZ	Pipeline station; emits criteria air pollutants
California		
ca-01	**Desert Security Farm**, EDR Map ID 104-35 RCRA-SCG, CA HIST UST, HAZNET 19250 S. Defrain Blvd., Blythe	Small-quantity generator of hazardous materials. *Low potential for concern*
	Compton Ag Services/Dune Company of Blythe/Diana Gray, EDR Map ID 105-35 SSTS, RMP, CA PEST LIC, GeoTracker 19751 S. Defrain Blvd., Blythe	Produces, sells, and advises on agricultural pesticides
	Union Feedyard, EDR Map ID 100-35 CA WMUDS/SWAT	Solid waste facility; minor threat to drinking water
	Henderson Ranch, EDR Map ID 102-35 LUST Ludy Blvd., Blythe	Gasoline leak (1996); clean-up complete (1997)
	Unnamed Transformer, EDR Map ID 95-36 CA CHMIRS 9231 East 18th Ave., Blythe	Hazardous material incident: car accident hit pole, causing transformer to leak 20 gallons mineral oil to road and soil; polychlorinated biphenyls (unknown); no waterways affected. *Low potential for concern*
	Barnes & Berger, EDR MAP ID 97-34 RCRA-SQG, HAZNET 13460 18th Ave., Blythe	Small-quantity generator of hazardous materials (previously a large generator); blends fuels on site. *Low potential for concern*
	James & Van Dyke, EDR MAP ID 96-35, 36 CA PEST LIC 9510 18th Ave., Blythe	Applies, sells, and/or advises on agricultural pesticides
ca-02	None listed	—

SEGMENT	SITE NAME, RELEVANT DATABASE, AND LOCATION	POTENTIAL ENVIRONMENTAL CONCERN
ca-04	**El Paso Natural Gas – Baja Compressor Station,** EDR MAP ID 63,69-36 AZ EMAP, AZ Enforcement, US AIRS 50650 Colorado River Rd., Ehrenberg	Pipeline station; emits criteria air pollutants
	Joseph I. John, EDR MAP ID 78-36 CA PEST LIC 8701 Seeley Ave., Blythe	Applies, sells, and/or advises on agricultural pesticides
	Modern Ginning Co., EDR Map ID 81-35 RCRA-SQG 10601 Seeley Ave., Blythe	Small-quantity generator of hazardous materials. *Low potential for concern**
	Barnes & Berger, EDR MAP ID 78-36 RCRA-SQG, HAZNET 15091 S. Intake Blvd., Blythe	Small-quantity generator of hazardous materials. *Low potential for concern*
	Western Farm Svc Desert Div., EDR MAP ID 74-35 RCRA Non Gen/NLR 15th and 15400 Lovekin, Blythe	Stores, transports hazardous materials on site; potential for contamination; no violations
ca-05	**Blythe City Wastewater Treatment** EDR MAP ID 79-35 LUST, WDS, EMI, NPDES 15901 South Broadway, Blythe	Possible diesel and additive contamination; facility emits criteria air pollutants and has history of non-compliance for nitrates; raw sewage spills
	Mallett and Sons Trucking, EDR MAP ID 82-35 RCRA-SQG, HIST UST 10901 Seeley Ave., Blythe	Small-quantity generator of ignitable waste; benzene tetrachloroethylene, and trichloroethylene. *Low potential for concern**
	Harvest Fuels, EDR MAP ID 82-35 UST, HIST UST 10955 Seeley Ave., Blythe	Registered underground tank; possible unreported leaks. *Low potential for concern**
	Cyr Aviation, EDR MAP ID 74-35 FINDS, ECHO 490 Holley Ln., Blythe	Airport; storage of bulk fuels likely
	Ripley WTP 03-012, EDR MAP ID 76-35 WDS, CA ENF	Wastewater treatment facility
	Crash Incident, EDR MAP 82-35 CHMIRS Seeley Rd. and Lovekin, Blythe	Crop duster crash; tank substances spilled onto field soils. *Low potential for concern*
	Blythe Feed and Seed, EDR MAP ID HIST UST 16530 S. Lovekin, Blythe	Unleaded fuel leak
	Former Puregro Facility, no EDR Map ID EnviroStor [LUST, FINDS] 15400 S. Lovekin Boulevard, Blythe	Inactive fertilizer, herbicide, and pesticide storage and distribution facility; an unleaded gasoline LUST was removed in 1988, remediation conducted, and case closed in October 2013

SEGMENT	SITE NAME, RELEVANT DATABASE, AND LOCATION	POTENTIAL ENVIRONMENTAL CONCERN
ca-05 (cont.)	**Main Street Dairy,** no EDR Map ID GeoTracker [LUST, FINDS] 14550 Ice Plant Road or 10650 Commercial Drive, Blythe	Potential migration of petroleum contamination from LUST release; case closed in 1982; 80–120 cubic yards of soil affected; groundwater not affected
ca-06	**Crash Incident**, EDR MAP 83-34 CHMIRS Stevenson and Seeley Streets, Blythe	Damaged breaker released mineral oil (non-polychlorinated biphenyl) onto soil and grass. *Low potential for concern*
ca-07	**Old Blythe Airport**, EDR Map ID 75-33 ERNS Blythe	Storage structure burned; emergency releases to soil reported
ca-09	None listed	—
x-09	**Joseph I. John**, EDR Map ID 78-36 CA PEST LIC 8701 Seeley Ave., Blythe	Applies, sells, and/or advises on agricultural pesticides
	NRG Solar Blythe, EDR Map ID 50-33, 71-34 FINDS, ECHO Unknown, Blythe	Electric generator
x-10	**Woten Aviation – Blythe**, EDR Map ID 56-33 CA SLIC 17798 Blythe Way, Blythe	Potential airplane or vehicle fuel
	Frontier Communications Mesa Verde, EDR Map ID 50-33 Mesa Dr. and Palowalo Rd., Blythe	Communication (cell) tower; unknown concern
x-11	Chuck Jones Flying Service 10950 20th Ave., Blythe	Potential airplane or vehicle fuel
x-12	None listed	—
x-13	None listed	—
x-15	None listed	—
x-16	None listed	—
x-19	None listed	—

Note: EDR Map ID lists site number and corresponding map number (“site”- “map”) as labeled in HDR 2016c Ten West Link 500kV Transmission Line Project Hazardous Materials Baseline Technical Report.
* Likely exceeds reasonable search radius for RCRA generators, or registered tanks under ASTM 1527-13.
Shading indicates sites of potentially higher environmental concern that may that may warrant additional investigation and/or additional stakeholder consultation.

3.14 PUBLIC HEALTH AND SAFETY

3.14.1 Applicable Laws, Regulations, Policies, and Plans

A number of Federal, state, and county laws, regulations, policies and plans pertain to public health and safety, and to general health and safety, fire, and electric and magnetic fields (EMF) in particular across the study area. Information pertaining laws, regulations, policies, and plans related to noise are found in Section 3.12 above.

3.14.1.1 Federal

National Environmental Policy Act. On the Federal level, NEPA serves as the primary legislation requiring assessment and mitigation of potential impacts on public health and safety on Federally administered land. NEPA (42 USC 4321–4347) directs Federal agencies, including the BLM, to assess impacts, adverse and otherwise, on the environment.

Occupational Safety and Health Act of 1970. The Occupational Safety and Health Act, administered by the OSHA, governs the safety and working conditions for men and women and provides training, outreach, education, and assistance. Under the Act, employers are responsible to provide a safe working environment and maintain a workplace without serious recognized hazards, including noise exposure levels.

International Building Code. The 2006 IBC is a model building code developed by the International Code Council. The IBC sets rules specifying the minimum acceptable level of safety for constructed objects. It was developed to consolidate existing building codes into one uniform code that provides minimum standards to ensure the health and safety of the public. The IBC replaced the Uniform Building Code. This code has been adopted by several agencies in the state of Arizona, including the Arizona Department of Health Services and the Arizona Department of Housing and by the state of California, with more stringent amendments.

National Electric Safety Code. The NESC provides rules and guidelines for practical safeguarding of workers and the public during the construction, operation, and maintenance of electric supply projects. While this code has not been adopted by the state of Arizona, it has been adopted by most municipalities, as well as Maricopa County. This code has been adopted by the state of California with more stringent amendments.

Additional Federal legislation related to the Project includes laws and acts associated with the risk for: accidental fires; transporting, presence, use, and disposal of hazardous materials and substances; internal and Federal electric safety and reliability codes; and health and safety regulations as applicable for workers while working on or near the Project. These additional laws and acts include:

- Title 14 CFR 91.137, Temporary Flight Restrictions in the Vicinity of Disaster/Hazard Areas;
- CERCLA (Superfund) (42 USC 9601 et seq.);
- Superfund Implementation (EO 12580, January 23, 1987);

- Superfund Amendments and Reauthorization Act of 1986;
- EPA Region 9 regulations (including Community Right-to-Know Information, Pesticide Management, Toxic Release Inventory, Brownfields, Cleanup Technologies, Compliance Assistance, Emergency Response, Hazardous Waste, Oil Spills);
- Federal Aviation Regulations Title 14 Part 77;
- Federal Compliance with Pollution Control Standards (EO 12088, October 13, 1978);
- Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements (EO 12856, August 3, 1993);
- Federal Earthquake Hazards Reduction Act of 1977;
- Federal Environmental Pesticide Control Act (7 USC 136);
- Hazardous Materials Transportation Act of 1974;
- Oil Pollution and Prevention Regulation;
- National Fire Protection Association 780: Standard for the Installation of Lightning Protection Systems, 2017 Edition;
- National Fire Protection Association 70: National Electrical Code;
- 1995 Federal Wildland Fire Policy (collaboration between the BLM, USFS, NPS, USFWS, BIA, and state wildfire management organizations);
- Pollution Prevention Act (42 USC 13101 et seq.);
- Resource Conservation and Recovery Act (42 USC 6901 et seq.);
- Solid Waste Disposal Act (42 USC 6901 et seq.);
- Toxic Substances Control Act (15 USC 2601 et seq.);
- Standard Processes Manual for Planning and Operating the North American Bulk Power System, NERC (2012);
- Title 29 CFR, US Department of Labor OSHA;
- Actions to Expedite Energy-Related Projects (EO 13212, May 18, 2001); and
- Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use (EO 13211, May 18, 2001).

3.14.1.2 State

Arizona

Arizona has adopted Federal OSHA regulations through the Arizona Occupational Safety and Health Act of 1972. The purpose of the Act is to provide safety and health protection for employees in Arizona. The Act requires employers to provide a workplace free of recognized hazards that may cause serious injury or death and to require employers and employees to follow all workplace safety and health standards, rules, and regulations. Arizona regulations closely follow Federal OSHA regulations.

The ACC regulates the electric power industry in Arizona, among other responsibilities. Within the ACC is housed the Arizona Power Plant and Transmission Line Siting Committee, which is responsible for reviewing projects and issuing certificates of environmental compatibility under ARS §40-360.06. Public safety is one of the factors assessed by the ACC in their evaluation of projects prior to issuing a certificate.

The Arizona Department of Forestry and Fire Management was established to provide for the prevention and suppression of wildfires on state trust land managed by the ASLD, as well as private lands outside the boundaries of incorporated communities. The intent of the Department is to manage and reduce fire risk to provide for the safety of Arizona's people, communities, and natural environment.

California

The CalEPA was created in 1991, which unified California's environmental authority consolidating several boards and state regulators under one agency. The consolidation of these agencies under CalEPA allows for more consistent application of regulations and coordinated use of state resources for the protection of human health and the environment, including state-level OSHA and hazardous waste management.

The CPUC regulates privately-owned electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies in the state of California. The mission of the CPUC is to serve the public interest by protecting consumers and ensuring safe, reliable utility service and infrastructure to the residents of California. CPUC General Order 95 (CPUC 2016) was originally established in 1941 to provide rules and regulations for overhead electric line construction and was recently revised in January 2016. The purpose of General Order 95 is to outline the requirements for overhead electric transmission line design, construction, and maintenance to ensure adequate service and provide for public safety.

In cooperation with multiple state utilities, the state of California published the Power Line Fire Prevention Field Guide 2008 Edition. The Guide "contains standards, statutes and regulations that are necessary to minimize wildland fires that may be caused by the operation and maintenance of electrical power lines and energized electrical equipment used in the delivery of electrical power" and provides minimum standards for maintaining consistency with relevant California regulations (California Department of Forestry and Fire Protection [CAL FIRE] 2008). California Public Resources Code Section 4125-4137 also addresses the responsibilities for fire protection. The code states that fire prevention and suppression is primarily the responsibility of the state (i.e., CAL FIRE), except for lands owned or controlled by the Federal government, lands within the boundaries of any city or county with a population of more than 25,000, and lands that are not vegetated to some degree as described in Section 4126 of the Code.

The state of California does not have a comprehensive noise statute but requires a noise element to be incorporated in all city and county general plans.

3.14.1.3 Local

County, city, and town general plans along the Proposed Action contain policies related to public health and emergency planning. A survey of general plans along the Proposed and Alternative segments indicated that most municipalities require the submittal of construction and operational safety plans for proposed construction for review and approval prior to issuance of permits.

Maricopa County

Maricopa County's Health Services includes a department for Air Quality, Environmental Services, and Public Health. The Department of Environmental Services has a Plan Review process where new facilities submit plan sets for overall review of potential effects. Additionally, the Department of Emergency Management works locally to regulate and control emergencies such as fires and emergency response protocols. Further details are in the Maricopa County Comprehensive Plan: Vision 2030 (2016) and the Tonopah/Arlington Area Plan (Maricopa County 2007). In addition, Maricopa County has adopted the International Fire Code in its entirety.

La Paz County

La Paz County's Community Development Department regulates and oversees environmental health in the county. This includes county guidelines on wells, on-site wastewater, and septic haulers. The county's Emergency Services Department has established guidelines and protocols for emergencies including wildfires in the county. Further details are in the La Paz County Comprehensive Plan (2005).

Riverside County

Riverside County's Department of Environmental Health regulates and oversees a wide range of activities in the county including hazardous waste handling, solid waste management, and well use and monitoring. The County's Fire Department oversees and regulates fire emergencies. Further detail can be found in the Riverside County General Plan (2003, as amended), General Plan Update GPA No. 960, 2008 Riverside County General Plan (baseline, never fully adopted), and the Riverside County Multi-Jurisdictional Hazard Mitigation Plan, June 2012.

Town of Quartzsite

The Town of Quartzsite provides detail on guidelines for health and safety and emergency protocols in the Quartzsite General Plan (2014). No quantitative noise limits have been designated by the Town of Quartzsite.

City of Blythe

The City of Blythe provides detail on guidelines for health, safety, and emergency protocols in the City of Blythe General Plan 2025 (2007). The City of Blythe has established quantitative noise levels of 60 dB at the boundary of a project where residential areas or other noise-sensitive land uses are present within the project's area.

3.14.2 Study Area

The study area for general public health and safety, inclusive of intentional acts of destruction, is a 4,000-foot-wide corridor encompassing the Proposed and Alternative segments, including associated substations and staging areas. Given the broad range of issues potentially associated with the Project, a 4,000-footwide corridor is sufficient to capture the potential health and safety issues that may come into play due to the Project. The public health and safety study area also encompasses 200-feet on either side of the alternative SCS 12kV distribution line.

The study area for the assessment of fire and fuels management includes lands that may be affected by Project construction and operation, and areas within 1 mile of the Proposed and Alternative segments, including associated substations and staging areas. This area encompasses the Delaney and Colorado River substations, permanent and temporary access roads, and staging areas. A 2-mile-wide study area was selected for fire and fuels management to allow these topics to be assessed in areas where there are errors or ambiguities in the recorded locations and boundaries of fires or other incidents, and also due to the unpredictable nature and extent of fires.

The study area for the assessment of EMF is based on an analysis of EMF strengths at the center and at the edge of the proposed 200-foot-wide ROW as well as an area extending 100 feet on each side of the ROW.

3.14.3 Existing Conditions

The locations of sensitive receptors within of the noise study area for the Proposed Action and Alternative Segments are listed in Table 3.14-1**.** A sensitive receptor is defined as a single home, mobile home, or building that could include a nursing home, hospital, or daycare center, as well as schools and churches.

Table 3.14-1 Segments of the Project with Identified Sensitive Receptors

ZONE	SEGMENT	STATUS	SENSITIVE RECEPTORS	LOCATION
Quartzsite	qn-02	Alternative Segment	80	Residences and Quartzsite Alliance Church in Quartzsite, Arizona
Quartzsite	qs-01	Alternative Segment	251	Residences including La-Z Daze Trailer Park and Rice Ranch RV Park, the Church of Jesus Christ of Latter-day Saints, and LTVAs in Quartzsite, Arizona
Quartzsite	qs-02	Alternative Segment	54	Residences including Desert Gardens RV Park and a Super 8 Hotel in Quartzsite, Arizona
Quartzsite	x-06	Alternative Segment	Variable; thousands per year	Adjacent to La Posa LTVA; the number and location of potential sensitive receptors changes over time
Quartzsite	x-07	Alternative Segment	Variable; thousands per year	Through La Posa LTVA south of Quartzsite, Arizona; the number and location of potential sensitive receptors changes over time
Colorado River and California	p-15w	Proposed Action	8	Rural residential area near Ripley, California
Colorado River and California	x-09	Alternative Segment	2	Residences along the Colorado River in Blythe, California

ZONE	SEGMENT	STATUS	SENSITIVE RECEPTORS	LOCATION
Colorado River and California	x-10	Alternative Segment	63	Residences along the Colorado River in Blythe, California
Colorado River and California	x-11	Alternative Segment	8	Residences along the Colorado River in Blythe, California
Colorado River and California	x-12	Alternative Segment	2	Rural residential area southwest of Blythe, California
Colorado River and California	x-13	Alternative Segment	2	Rural residential area near Blythe, California
Colorado River and California	ca-01	Alternative Segment	8	Rural residential area south of Blythe, California
Colorado River and California	ca-05	Alternative Segment	21	Rural residential area near the Cyr airfield near Blythe, California
Colorado River and California	ca-06	Alternative Segment	3	Rural residential area near Blythe, California

3.14.3.1 Fire

The risk of wildland fire is related to weather conditions (temperature, humidity, wind, and lightning), potential fire ignition sources, the presence and condition of fuels (vegetation), and associated fire regimes. These parameters are described in further detail below. Overall wildfire threats in the study area are illustrated in Figures 3.14-1a to 3.14-1c (Appendix 1).

Weather

Weather conditions are often hot and dry in the southwestern US. The Sonoran Desert has a bimodal rainfall pattern, with rain from frontal systems occurring in the late fall and winter and convection systems causing thunderstorms during the summer. Average annual rainfall in the Project Area generally is less than 5 inches. Average monthly temperatures range from a low of approximately 52 degrees F during December and January to an average high of 93 degrees F in July and August (ADWR 2009). Average daily humidity ranges from a high of 51.7 percent at 5 a.m. to 21.9 percent at 5 p.m. High winds can accelerate wildfire ignitions by increasing the supply of oxygen, evaporating any surface fuel moisture, and pushing existing burning material into new unburned fuel.

The NOAA's National Weather Service Storm Prediction Center maintains a Severe Weather Event Archive search engine containing data from January 3, 2000, to present. This database publishes general point locations on a map of the US of severe thunderstorm episodes by state. The point locations indicate high wind, large hail, and tornado reports. Specific Project Area severe weather statistics are unavailable, but the database indicates that the severe weather events most common in the fire study area are thunderstorms with high winds (NOAA 2016b). Fire activity in the southwestern US increases in the spring, because the weather transitions from windy and dry to hot and dry, primarily between March and September with the peak fire activity occurring between mid-May and mid-July (NWCG 2014). Wildfire history is closely related to climatic patterns and vegetation (BLM 2016r).

Lightning strikes, which are common during summer thunderstorms in the region, can cause fires. In 2015, 986 lightning-induced fires with 182,890 acres burned were reported in the southwest region and 397 fires with 207,935 acres burned were reported in southern California (NIFC 2016). Specific Project Area lightning-caused fire statistics are not readily available to the public; available records of fires and ignition sources in the fire study area are shown in Table 3.14-2 (AZDFFM 2017; Short 2015; USGS 2016c).

Table 3.14-2 Available Records of Fires and Ignition Sources in the Fire Study Area

ZONE ASSOCIATED WITH PROPOSED ACTION	IGNITION SOURCES (COUNT)[A]
East Plains and Kofa	Human (75) • 1 arson • 1 campfire • 3 debris burning • 19 equipment use • 9 smoking Unknown (73)
Quartzsite	Human (15) • 1 campfire • 3 equipment use Natural (1 – lightning) Unknown (11)
Copper Bottom	Human (31) • 1 arson • 2 campfire • 4 debris burning • 5 equipment use Natural (2) • 1 lightning Unknown (23)
Colorado River and California	Human (131) • 13 arson • 5 campfire • 8 children • 23 debris burning • 37 equipment use • 1 power line • 12 smoking Natural (3 - lightning) Unknown (51)

Sources: AZDFFM 2017; Short 2015; USGS 2016c; [a] Data obtained from AZDFFM (2017) includes records between 1999 and 2008. Data obtained from Short (2015) includes records from Federal, state, and local sources between 1992 and 2013. Data obtained from USGS (2016c) includes only records from Federal sources between 1982 and 2015. Overlapping information has been removed to the degree possible.

Previous fires in the study area between 1982 and 2015 were primarily classified as human-caused, with the majority located along the I-10 corridor and around Blythe. A large portion of the fires occurred due to equipment use and debris burning, with fewer being caused by campfires, smoking, or arson. One incident was classified as caused by a power line. Within the Project Area, areas that experience heavy human use often experience higher incidences of fire (BLM 2016r). These areas include the I-10 corridor and areas around Quartzsite, Mesa Verde, and Blythe. Most of the fires recorded were caused by humans via arson, campfire, debris burning, equipment use, power line (arcing), or smoking. Of these human ignition sources, the largest percentage resulted from equipment use, followed by debris burning. A small portion (approximately 1 percent) of the fires recorded were ignited by natural occurrences. The area surrounding Blythe experienced the greatest number of fires in the past few decades.

The YPG is within the study area; the primary mission of the YPG is to ensure that the weapon systems and equipment issued to soldiers functions safely and as intended. The portion of the YPG closest to the study area is open space land where diverse activities are conducted, including testing aviation weapons and systems (including unmanned aircraft systems), air cargo delivery systems, ground combat systems, and a variety of mines and countermines (including detection and elimination systems for improvised explosive devices) (YPG 2016). These activities, as well as soldier and weapons training activities, could cause an increased risk of fire in the study area.

Ignition sources

The majority of the study area falls within Sonoran-Palo verde-mixed desertscrub and Sonoran-Mojave creosote bush-white bursage desertscrub biotic communities. Fire is not a natural process within desertscrub communities, as the distance between shrubs is too big for fires to spread unless annual plant growth is high. Wildfires, either naturally occurring or human caused, are rare within desertscrub and are typically small in size (less than 1 or 2 acres) before they burn out naturally (BLM 2016r). The presence of non-native plants (e.g., salt cedar), particularly in riparian areas, does increase the susceptibility of fire (BLM 2016r).

Fuel types in the study area generally fall into Fire Behavior Prediction System Fire Behavior Fuel Model 1 and National Fire Danger Rating System Fuel Model A (NWCG 2014). Fire spreads under Fire Behavior Fuel Model 1 "rapidly and on the surface by fine, very porous, and continuous herbaceous fuels that have cured or are nearly cured" (Anderson 1982). The National Fire Danger Rating System Fuel Model A represents annual grasses and grass/shrub fuels, where brush or trees are present, but represent less than one-third of the area. The quantity and ground coverage of annual grasses and shrubs can vary from year to year. The Project Area also contains areas that may fall under Fuel Models 4 and 5, particularly around the Colorado River. Under Fuel Model 4, fire intensity is dependent on the foliage and live and dead fine woody material in the shrub layer, which can result in fast-spreading fires. Under Fuel Model 5, fire is spread mainly through litter from the shrubs, grasses, and forbs in the understory. Fires in Fuel Models 1, 4, and 5 can spread quickly due to the fuel type. Fires in Fuels Models 4 and 5 can also be high intensity fires, while fires in Fuel Model 1 are typically flashier and quick burning (NWCG 2014).

Fire Management

Fire management and protection responsibility in and near the fire study area is assigned to Federal, tribal (on Federal and tribal land), state (on state trust and most unincorporated county land), or local (on incorporated [municipal] land and some unincorporated county land) jurisdiction. While individual firefighting agencies have primary responsibility for specific geographic areas, under interagency cooperative and mutual aid agreements, firefighting agencies throughout the region assist each other as needed. Typically, when a wildland fire is reported, the nearest available firefighting units are dispatched because it is not always immediately clear which wildland parcels are involved and which agency has jurisdiction.

In Arizona, the Southwest Coordination Center (SWCC) coordinates and mobilizes resources for wildland fires, prescribed fires, and other incidents. The Arizona portion of the fire study area is within the SWCC Central West Zone. The Prescott Interagency Dispatch Center, located in Prescott, Arizona, is the contact office for wildland fires in the Arizona portion of the Project Area (SWCC 2016). BLM's Colorado River District Fire Zone (AZ-CRD) is located in and is a full participant in the SWCC Central West Zone. The AZ-CRD encompasses the BLM Kingman, Lake Havasu, and Yuma field offices. The dispatch center for the AZ-CRD is the Prescott Interagency Fire Center. The vegetation in this zone is dominated by desert shrubs, trees, and cacti, and deep upland sites have overstories of mesquite, palo verde, and ironwood, with understories of perennial and annual grasses and forbs. In the higher elevations of the Hualapai Mountains, pinyon and ponderosa pines dominate the landscape, while the Colorado River corridor features salt cedar, willows, cottonwoods, and other riparian vegetation. Approximately 98 percent of fires in this zone are human caused and generally occur between February and October. Most of these fires occur near main travel corridors and rivers. The 20-year annual average for all fire causes equates to 36 fires per year, burning an average of 3,000 acres per year (BLM 2016r). BLM's Phoenix District Fire Zone (AZ-PHD) is located within and is a full participant in the SWCC Central West Zone. The AZ-PHD is administered by the BLM Hassayampa and Lower Sonoran field offices. The dispatch center for the AZ-PHD is the Phoenix Interagency Fire Center. The zone's fire program is responsible for the protection of nearly 2.4 million acres of BLM public lands and an additional 1.1 million acres within the Barry M. Goldwater Air Force Training Range. A variety of fuel types exist in this region, including the Sonoran Desert ecosystem, grass lands, desert oak/chaparral with intermixed manzanita, desert shrub, and ponderosa pine. Fire season usually begins in mid-March and ends in early September, with an annual average of 61 fires, burning an average of 9,000 acres of BLM public lands each year (BLM 2016r).

In California, CAL FIRE provides fire protection for more than 31 million acres of California's privately-owned wildlands and emergency services in 36 California counties (CAL FIRE 2016a). In the fire study area in California, fire suppression in Blythe and the surrounding area is a local (county or city) or Federal (BLM) responsibility. The City of Blythe Fire Department and the Riverside County Fire Department (RCFD)/California Department of Forestry provide local fire protection in this area. The desert west of Blythe is rated as a moderate fire hazard severity zone, and fire suppression in this area is a Federal or county responsibility, depending on jurisdiction. The nearest fire stations to the Proposed and Alternative segments include the Blythe Fire Department and the CAL FIRE RCFD stations 43, 44, and 46 (RCFD 2016). The Project falls within the RCFD's East Desert Division, which encompasses the lower Coachella Valley east to the Arizona state line. CAL FIRE RCFD services include municipal and wildland fire protection and prevention services and pre-hospital emergency medical services including paramedics, hazardous materials response, and technical rescue services. All stations are dispatched by the CAL FIRE RCFD Emergency Command Center under the integrated Fire Protection System. The natural fire risk in the area is moderate, based on vegetation, climate, and topography.

3.14.3.2 Electromagnetic Fields

Extremely low frequency (ELF) EMF is the type associated with transmission lines. EMF are invisible lines of force that you cannot feel that surround electrical equipment, power cords, wires that carry electricity, and outdoor power lines. EMFs can occur together or separately and are a function of voltage and current. On a daily basis people around the world are exposed to ELF EMF as a result of using electricity.

Levels of EMF under existing conditions were modeled using the Bonneville Power Administration "CAFE" program, based on a horizontally-configured, single 500kV circuit on a structure 145 feet in height, with a minimum clearance of 36.25 feet above ground at the location of maximum sag between structures (HDR 2017g). This represents the minimum ground clearance for the Project considering areas where the conductor sag is at its lowest point, thus providing for the maximum field strengths. The magnetic and electric field strengths were calculated at a height of 1 meter (3.280 feet) above ground (HDR 2017g).

Rather than model EMF at all of the identified receptors in the study area, EMF was modeled at 10 representative locations (HDR 2017g). Each location is representative of specific segments of the Project and with varying design configurations to represent the range of potential configurations for the Project (Table 3.14-3). As such, results of the modeling for these 10 locations can be applied, and considered representative, of the other Proposed Action and Alternative segments.

Table 3.14-3 Modeled levels of EMF under existing conditions at the Edge of the ROW at 10 representative locations in the Study Area

SITE NO.	STATE	APPROXIMATE LOCATION	ELECTRIC FIELDS (KV/M)		MAGNETIC FIELDS (MG)	
			LEFT SIDE	RIGHT SIDE	LEFT SIDE	RIGHT SIDE
1	AZ	**p-01**: North of Delaney Substation	0.2	1.8	16.8	28
2	AZ	**d-01**: Alternative 1 west of Delaney Substation	0.8	0.3	19.5	9.9
3	AZ	**i-03**: I-10 Utility Corridor	0	0	0	0
4	AZ	**p-06**: Kofa National Wildlife Refuge	1.6	1.6	43.0	43.0
5	AZ	**qn-02**: North of I-10 and northeast of Quartzsite	0.4	0.5	28.2	22.4
6	AZ	**x-07**: South of I-10 and south of Quartzsite	0.8	0.8	43.0	43.0
7	AZ	**cb-04**: Copper Bottom Pass	0.5	0.2	49.8	23.3
8	CA	**p-15w**: farmland east of Blythe	1.9	1.9	50.2	50.2

SITE NO.	STATE	APPROXIMATE LOCATION	ELECTRIC FIELDS (KV/M)		MAGNETIC FIELDS (MG)	
			LEFT SIDE	RIGHT SIDE	LEFT SIDE	RIGHT SIDE
9	CA	**x-16**: East of Colorado River Substation	0.8	0.8	48.5	53.7
10	CA	**p-17**: East of Colorado River Substation	1.6	0.8	41.4	46.6

The science around EMF and possible health concerns has been extensively researched. Government and medical agencies including Health Canada (2012), the World Health Organization (WHO; WHO 2012), the International Commission on Non-Ionizing Radiation Protection (ICNIRP 2010), the International Agency for Research on Cancer (IARC 2002) and the US National Institute of Health (NIH) and National Institute of Environmental Health Sciences (NIEHS 2002a) have all thoroughly reviewed the available information. While individual opinions on the issue vary, the weight of scientific evidence does not support a causal link between EMF and health issues at levels typically encountered by people (i.e., from transmission lines and substations).

Short-term exposure to EMF at high levels is known to cause nerve and muscle stimulation in the central nervous system. Based on this information, the ICNIRP, a group recognized by the WHO as the international independent advisory body for non-ionizing radiation protection, established an acute exposure guideline of 2,000 milligauss (mG) for the general public, based on power frequency EMF of 50-400 Hz (ICNIRP 2010). With respect to long-term exposure to low levels of EMF, it needs to be acknowledged that the IARC and WHO have categorized EMF as a Class 2B possible human carcinogen, based on a weak association of childhood leukemia and magnetic field strength above 3-4 mG (IARC 2002). This means there is limited evidence of carcinogenicity in humans and inadequate evidence of carcinogenicity in experimental animals. These human studies are weakened by various methodological problems that the WHO has identified as a combination of selection bias, some degree of confounding and chance (WHO 2007). There are also no globally accepted mechanisms that would suggest that low-level exposures are involved in cancer development and animal studies have been largely negative (WHO 2007). Thus, the WHO has stated that, the evidence linking childhood leukemia to EMF exposure is not strong enough to be considered causal (WHO 2012: http://www.who.int/peh-emf/en/). Concerns have also been raised by some about a relationship between EMF and a range of various health concerns, including cancers in adults, depression, suicide and reproductive dysfunction, among several others. The WHO (2007) has stated: "…scientific evidence supporting an association between ELF magnetic field exposure and all of these health effects is much weaker than for childhood leukemia."

Presently, health-based EMF standards for 60 Hz fields have not been adopted at the national level or by the states of California or Arizona. However, in addition to the ICNIRP guidelines (2,000 mG for magnetic fields; 8.33 kV/m and 4.16 kV/m for occupational and general public exposures, respectively), the IEEE and ACGIH have guidelines to compare predicted EMF levels to.

- Institute of Electrical and Electronics Engineers (IEEE) Standard C95.6-2002 (IEEE 2002) provides maximum permissible electric field exposure levels of 20 kV/m in a controlled environment, 5 kV/m for the general public and 10 kV/m within power line ROW under normal load conditions. The maximum permissible magnetic field exposure in the standard is 27,100 mG for occupational and 9,040 mG for general public.
- American Conference of Governmental Industrial Hygienists (ACGIH) provides threshold limit values (TLVs) for power frequency magnetic fields and electric fields. Applicable to the Project is the ACGIH TLV of 10,000 mG for occupational exposure to magnetic fields and 15-25 kV/m for electric fields (ACGIH 2017). The ACGIH also has a suggested TLV for people with implanted medical devices of 1,000 mG.

As can be seen in Table 3.14-3, existing levels of EMF in the study area are below these thresholds.

In 1991, the CPUC initiated an investigation into electric and magnetic fields associated with electric power facilities. This investigation explored the approach to potential mitigation measures for reducing public health impacts and possible development of policies, procedures, or regulations. Following input from interested parties, the CPUC implemented an EMF Policy decision in 1993 (D.93-11-013) that requires that utilities use "low-cost or no-cost" mitigation measures for facilities requiring certification under General Order 131-D. The decision directed the utilities to use a 4 percent benchmark on the low-cost mitigation. This decision also implemented a number of EMF measurement, research, and education programs, and provided the direction that led to the preparation of the California Department of Health Services comprehensive review of existing studies related to EMF from power lines and potential health risks. The CPUC did not adopt any specific numerical limits or regulations on EMF levels related to electric power facilities. The EMF Policy decision was re-affirmed on January 26, 2006 (D.06-01-042) with some clarifications on adopted rules and policies to improve utility design guidelines for reducing EMF.

In Decision D.06-01-042, the CPUC addressed mitigation of EMF from utility facilities and implemented the following recommendations.

- The CPUC has exclusive jurisdiction over issues related to EMF exposure from regulated utility facilities.
- Continuing the current policy of low-cost and no-cost EMF mitigation, as defined by a 4 percent benchmark of total project cost, the CPUC would consider minor increases above the 4 percent benchmark if justified under unique circumstances, but not as a routine application in utility design guidelines. CPUC added the additional distinction that an EMF mitigation cost increases above the 4 percent benchmark should result in significant EMF mitigation to be justified, and the total costs should be relatively low.
- For low-cost mitigation, the EMF reduction will be 15 percent or greater at the utility ROW.
- Parties generally agree on the following group prioritization for land use categories in determining how mitigation costs will be applied:
    1. Schools and licensed day care facilities
    2. Residential

3. Commercial/industrial
4. Recreational
5. Agricultural
6. Undeveloped land

- Low-cost EMF mitigation is not necessary in agricultural and undeveloped land except for permanently occupied residences, schools, or hospitals located on these lands.
- Although equal mitigation for an entire class is a desirable goal, it will not limit the spending of EMF mitigation to zero on the basis that not all class members can benefit.

The CPUC does not require that utilities include non-routine mitigation measures, or other mitigation measures that are based on numeric values of EMF exposure.

3.14.3.3 Interference

Noticeable radio and TV interference may occur in close proximity to an AC transmission line due to corona or gap discharges. This interference is typically limited to AM radio and analog TV. FM radio frequencies and cable TV are not sensitive to transmission line interference (IEEE 1971).

When radio interference around a transmission line does occur, it is most likely due to gap discharges, which occur when separations (gaps) develop between mechanically connected metal parts (e.g., due to broken, improperly installed, or loose hardware). Line hardware is designed to be problem free, but wind motion, corrosion, and other factors can create a gap discharge condition. These conditions can lead to utility equipment or material failures. Therefore, when identified, the utility will locate and remedy them promptly.

3.14.3.4 Intentional Acts of Destruction

Intentional acts of destruction include acts of sabotage, terrorism, vandalism, and theft that sometimes occur at power facilities, including transmission lines and substations; these acts have the potential to create health and safety hazards. Vandalism and thefts are the most common intentional destructive act, especially theft of metal and other materials that can be sold when the price of construction materials is high on the salvage market. Statistics for intentional acts of destruction on existing transmission facilities within the study area are not available. However, the majority of the study area is within sparsely populated rural or undeveloped terrain. The most common adjacent developed areas or infrastructure include limited transportation and utility infrastructure, the Town of Quartzsite, and the City of Blythe.

Local governments provide public services such as police, fire, and emergency medical services. These services are primarily based out of Quartzsite and Blythe for the residents within the public health and safety study area. Quartzsite has its own police, fire, and rescue departments, including emergency medical services. The City of Blythe has its own police department and a volunteer fire department, as well as a hospital and emergency medical services.

As noted in Section 3.14.3.1, fire management and protection responsibility in and near the study area is assigned to Federal, tribal, state, or local jurisdiction. While individual firefighting agencies have primary responsibility for specific geographic areas, under interagency cooperative and mutual aid agreements, firefighting agencies throughout the region assist each other as needed.

Critical care facilities and emergency services departments within the study area that could be affected by an intentional act of destruction to the Project are identified in the following tables. Table 3.14-4 identifies the medical facilities within or near the study area. Table 3.14-5 identifies the law enforcement agencies within or near the study area. Table 3.14-6 identifies fire protection services within or near the study area.

Table 3.14-4 Medical Facilities

COUNTY	FACILITY NAME	LOCATION
La Paz	La Paz Medical Service	150 E Tyson Road, Quartzsite, AZ
La Paz	La Paz Regional Hospital	1200 W Mohave Road, Parker, AZ
La Paz	Valley Medical and Eye Center	394 N Central Blvd, Quartzsite, AZ
Riverside	Palo Verde Hospital	250 N 1st Street, Blythe, CA
Riverside	Blythe Medical Clinic	321 W Hobsonway, Blythe, CA

Table 3.14-5 Law Enforcement Agencies

COUNTY	LAW ENFORCEMENT AGENCY	LOCATION
La Paz	Quartzsite Police Department	305 N Plymouth Ave, Quartzsite, AZ
La Paz	La Paz County Sheriff's Department	1109 W Arizona Ave, Parker, AZ
Maricopa	Buckeye Police Department	100 N Apache Road, Buckeye, AZ
Riverside	Blythe Police Department	240 N Spring Street, Blythe, CA
Riverside	Riverside Company Sheriff – Blythe Station	260 N Spring Street, Blythe, CA

Table 3.14-6 Fire Protection Agencies

COUNTY	FIRE PROTECTION AGENCY	LOCATION
La Paz	Quartzsite Fire District	70 Tyson Road, Quartzsite, AZ
La Paz	Bouse Fire District	44031 Plomosa Road, Bouse, AZ
La Paz	Buckskin Fire Department	8500 Riverside Drive, Parker, AZ
La Paz	Ehrenberg Fire Department	49480 Ehrenberg Poston Hwy, Ehrenberg, AZ
La Paz	Harquahala Fire District	51501 W Tonto Street, Tonopah, AZ
La Paz	PVNGS Fire Department	5801 S Wintersburg Road, Tonopah, AZ
La Paz	Tonopah Valley Fire Department	36511 W Salome Hwy, Tonopah, AZ
Maricopa	City of Buckeye Fire Department	21699 W Yuma Road, Buckeye, AZ
Maricopa	Buckeye Rural Fire District	29938 W Taylor Street, Buckeye, AZ
Riverside	Blythe Fire	201 N Commercial Street, Blythe, CA
Riverside	Palo Verde Fire Department	112 Highway 78, Palo Verde, CA
Riverside	Riverside County Fire	43880 Tamarisk Drive, Desert Center, CA
Riverside	San Bernardino Fire Department	150260 Capistrano Way, Big River, CA

Communication services within the study area include telecommunications, radio, cable, Internet, and satellite services and are provided by local and national service providers.

3.14.3.5 Other

Valley fever is a naturally occurring potential public health hazard in the Project Area. Valley fever spores survive in soils in many parts of Arizona and California. When soil is disturbed by activities such as grading, digging, vehicle operation on dirt roads, or high winds, the fungal spores can become airborne and potentially inhaled (BLM 2015a). As presented in Section 3.3.3.5, these spores, if inhaled in high enough concentrations, can cause a person to become sick with an illness called valley fever.

3.14.3.6 Zone-specific Conditions

As identified in Table 3.14-1, receptors are located in proximity to one Proposed Action route segment in California (Segment p-15w) and 13 Alternative Segments in California and Arizona, and are generally located in or near Quartzsite and Blythe, within two identified zones: the Quartzsite Zone and the Colorado River and California Zone.

East Plains and Kofa Zone

In the East Plains and Kofa Zone, the area crossed by the Project is predominantly uninhabited desert. As identified in Table 3.14-1 above, sensitive receptors were not identified along the Proposed and Alternative segments in this zone. The Project would parallel the existing DPV1 500kV transmission line, most of which would be located within an existing BLM designated utility corridor. Access to the existing transmission line is provided mostly along privately owned and restricted utility access roads that are not designed for public vehicular traffic. No sensitive receptors were identified along the Proposed and Alternative segments in this area.

This area does not contain a large number of residences, therefore, a majority of the land within the study area is not considered a wildland development area. In the three areas containing wildland development areas, the indices are very, very low to moderate. Wildfire threat along the Proposed Action is mostly very, very low to very low, with portions of Proposed Action Segment p-01 crossing through moderate-high and high. The wildfire risk throughout this geographic area is mostly very low to low, with the areas immediately surrounding I-10 ranking from moderate to very high.

Quartzsite Zone

Alternative Segments qn-01, qn-02, qs-01, qs-02, x-06, and x-07 are north of the Proposed Action Segments p-07 and p-08. Alternative Segment x-07 is located along SR 95 and passes through the La Posa LTVA. Alternative Segment x-06 is adjacent to the LTVA. Various numbers of sensitive receptors may be present within the LTVA at any given time during the year, because visitors may stay for up to seven months and records of LTVA residents are kept only for a period of two weeks (HDR 2016b). Therefore, an exact number of receptors cannot be provided. However, the La Posa LTVA attracts tens of thousands of visitors per year, particularly during the winter months. The other Alternative Segments in this area are located along I-10 and near Quartzsite. Alternative Segments qn-02, qs-01, and qs-02 in this area include nearby receptors within the public health and safety area. Many of the potential sensitive receptors identified are residences in Quartzsite. The Church of Jesus Christ of Latter-day Saints, Quartzsite Alliance Church, RV and trailer parks, and a Super 8 Hotel are included among these receptors. Alternative Segments qs-01 and qs-02 pass through the very northern portion of the La Posa LTVA as well as Quartzsite and have the potential to effect thousands of receptors.

Along Proposed Action Segment p-08 and Alternative Segments qn-01 and x-07, the wildland development indices are very, very low to moderate. The wildland development area indices along Alternative Segments qs-01, qs-02, and qn-02 range from very, very low to high. Wildfire threat along the Proposed Action is mostly very, very low, with portions of the study area for Segment p-09 crossing through low and low-moderate. The wildfire threat along the alternative routes is mostly very, very low, but ranges up to low-moderate. The highest concentration of historical fires occurred along alternative Segment qs-02.

Copper Bottom Zone

The Copper Bottom Pass Area is on the Arizona side of the border between Arizona and California to the west of SR 95. The CRIT reservation is north of the area and the YPG is to the south. This area has limited land development, but is crossed by the proposed Arizona Peace Trail, a popular OHV route. Proposed Action Segments p-09 through p-14 connect at the east with p-08 and continue west through mountainous desert regions of western Arizona to the California border. The proposed Arizona Peace Trail runs adjacent to parts of Segments p-12 and p-13. As identified in Table 3.14-1 above, sensitive receptors were not identified along the Proposed and Alternative segments in this zone.

This area contains very few residences except for a small area just east of the Colorado River, therefore, a majority of the land within this geographic area is not considered wildland development area. In the wildland development area just east of the Colorado River, the wildland development area indices are very, very low to very high, with the lower indices south of I-10 and the higher indices north of I-10. Wildfire threat along the Proposed Action route is mostly very low, with portions of the study areas for proposed Segments p-09, p-10, and p-11crossing through low-moderate to moderate-high. The wildfire threat along the alternative routes south of I-10 is mostly very low but ranges up to moderate. However, the wildfire threat index along I-10 in the study areas for Segments i-06 and i-07 ranges from very low to extreme. Wildfire risk throughout this geographic area is mostly very, very low to low-moderate, with the areas surrounding I-10 ranking from low-moderate to moderate-high. The highest concentration of historical fires occurred along Alternative Segments i-06 and i-07. The study area for alternative Segment i-06 crosses the Dome Rock 14-day camping area.

Colorado River and California Zone

The Colorado River and California Zone includes the portion of the Project that crosses the Colorado River and California. The Proposed Action includes eight sensitive receptors along Segment p-15w while the alternative route includes numerous segments with sensitive receptors in the study area, particularly for Segments ca-01, ca-02, ca-05, x-10, and x-11. The Proposed Action segments are all south of Blythe and north of Ripley, California. As with the Proposed Action segments in Arizona, the Proposed Action segments in California continue to follow existing utility corridors and would be co-located with an existing 500kV transmission facility. However, unlike La Paz County and western Maricopa County in Arizona, the land south of Blythe is predominantly rural residential and farmland. Because of the presence of the city of Blythe and the change in land use and character, more public roads and sensitive receptors would be present.

Sensitive receptors in the study area of the Proposed Action include eight residential receptors in farming areas of Ripley along Segment p-15w. Hundreds of sensitive receptors were identified adjacent to the Alternative segments in this area. The Proposed Action has a low concentration of historical fires in comparison to the northern alternative route, however, of all the Proposed Action segments, Segment p-15w had the highest concentration of historical fires. The highest concentration of historical fires along the alternative route segments occurred along Alternative Segment ca-01.

Within this geographic area, the fire hazard severity zones differ based on population density. Areas in Blythe and some surrounding land, areas around the Blythe Airport, and areas surrounding the community of Mesa Verde are zoned as “urban unzoned.” The agricultural portions of the Project Area in California, mainly between the Colorado River and the Blythe Airport, are zoned as “non-wildland/non-urban,” meaning the risk for severe wildfires in these areas is low. The portion of this geographic area that lies on BLM-administered land, from Alternative Segments x-15 and x-16 west to Segment x-19, is zoned as “moderate,” meaning the risk of severe wildfires is moderate (CAL FIRE 2016b). The eastern portion of the Project Area in California, from the Colorado River west to Alternative Segments x-15 and x-16, is mostly classified as little to no threat to people from fires. Much of the remainder of the Project Area in California is classified as moderate threat to people, while portions of the study areas for Proposed Action Segments p-17 and p-18 cross through areas classified as high threat to people (CAL FIRE 2016b).

3.15 SOCIOECONOMICS

3.15.1 Applicable Laws, Regulations, Policies, and Plans

3.15.1.1 FLPMA and BLM Manual 1601

The BLM (2005) Land Use Planning Handbook (H-1601-1) specifies that the social and economic environment must be considered for all BLM-administered land use planning decisions. Additionally, in accordance with this handbook, by statute, regulation, and EO, the BLM must use social science in the preparation of informed, sustainable land use planning decisions. As noted in the BLM (2008a) NEPA Handbook (H-1790-1), socioeconomic issues typically occur within communities located outside BLM-administered land. Nevertheless, the BLM must analyze the impacts of a given decision or project on the social and economic resources of a community or region.

Section 202(c)(2) of FLPMA requires the BLM to integrate physical, biological, economic, and other sciences in developing land use plans (43 USC 1712(c)(2)). Under the Act, 43 CFR 1610.4-3 and 1610.4-6 also require the BLM to analyze social, economic, and institutional information. Section 102(2)(A) of NEPA requires Federal agencies to “ensure the integrated use of the natural and social sciences in planning and decision making.”

3.15.1.2 BLM Resource Management Plans

The Proposed and Alternative segments cross five BLM planning areas, managed by their five respective RMPs. These plans are the Bradshaw-Harquahala RMP, the Lake Havasu Field Office

RMP, the Lower Sonoran Field Office RMP, the YFO RMP, and the California Desert Conservation Area Plan, as amended by the Northern and Eastern Colorado Desert Plan. These plans provide information on and analyze the social and economic conditions of their respective planning areas. BLM management decisions have the potential to affect the social and economic conditions of communities and individuals within these planning areas. The study area crosses several county and local jurisdictions. These counties, cities, and towns also have goals, objectives, and policies outlined in comprehensive plans that are related to socioeconomics. A discussion of the regional and local guidelines and associated plans can be found in Section 3.8, Land Use.

3.15.2 Study Area

The study area for the socioeconomics resource analysis is the entirety of the three counties (Maricopa and La Paz Counties, Arizona; Riverside County, California) containing the Proposed and Alternative segments. Socioeconomic data are readily available for counties and most urban areas but are sometimes more sparse to gather for rural areas. Some elements of the analysis look at socioeconomic resources (i.e., population, age distribution, and housing units) specifically in the US Census block groups that are within 0.5 mile of these route segments or resources in municipalities or Census designated places (CDPs). This latter area is called the block group study area. **Section 3.16**, Environmental Justice, provides additional block group data on racial and ethnic composition and on poverty rates. The block group areas do not coincide with the zones used for analysis of the other resources in this Technical Environmental Study. Consequently, the socioeconomic study areas will differ somewhat compared to those of the other resources, although an attempt to fit the socioeconomic data into the zones has been included as Section 3.15.3.7.

Data gathering followed the guidance in Appendix D of the BLM's Land Use Planning Handbook and other similar publications. In general, the affected socioeconomic environment is described in terms of population, housing, employment, income, property values, tax revenues, and public services. A qualitative discussion of the non-market values of the local and regional environment is included.

US Census county-level and block group data for the three counties that make up the socioeconomics study area was collected and analyzed to identify notable trends over time and the characteristics of each county. The data analysis included comparison with the two states and the nation to provide an overview of the socioeconomic conditions in the area.

In many cases, the county level is the smallest statistical unit of data available. This restriction limits the data analysis to counties that might not fully represent the local area adjacent to the Proposed and Alternative segments. When reliable data were available, census block group or community-level data was used to supplement the county-level data in order to better represent local conditions. This smaller subset of data is referred to as the block group study area.

The data collection and analysis focused on the last 15 years, which provides enough data to identify trends and evaluate current conditions while considering changes associated with the recession of 2008. In some instances, this period was shorter because limited data were available. Quantitative (numeric) data was supplemented with information provided by local residents as provided through interviews and public meetings.

An Economic Strategies Workshop was conducted on June 14, 2016, to obtain feedback from local representatives on the data collected and analyzed. Attendees at the workshop expressed concerns that county-level socioeconomic study data do not represent the local conditions because the county-level data include the Phoenix metropolitan area in Maricopa County (Stantec 2016b). Similarly, county-wide data for Riverside County does not fully represent the portion of this county located in the Project Area due to the cities and other populated areas closer to Los Angeles and within the Coachella Valley region.

3.15.3 Existing Conditions

3.15.3.1 Population

Table 3.15-1 presents the population of the socioeconomics study area by US, state, county, and block group for 2000, 2010, and 2014. Due to changes in the geographic areas of the census block groups between 2000 and 2010, data for the block groups for year 2000 cannot be compared meaningfully to data for 2010 and is not included in the table. Figure 3.15-1 (Appendix 1) shows the block groups analyzed. As of 2014, the three counties in the socioeconomics study area had a total population of 6.2 million. More than 63 percent of this population resides in Maricopa County, and Riverside County accounts for just over 36 percent of the total population in the study area. La Paz County accounts for the smallest share, with 20,348 residents, or about 0.3 percent of the total for the socioeconomics study area, but it is more representative of the rural nature of the Project Area. As of 2014, the population in the block group study area was 21,710.

While the population of the overall socioeconomics study area increased from 2010 to 2014, the population of the block group study area decreased by 0.9 percent (203 residents). Within the block group study area, the block groups in Maricopa and La Paz Counties lost residents overall, while the block groups in Riverside County gained residents overall. Although this percentage change is small compared to the trends in the counties, states, and US, the size of the population in the block group study area is very small to begin with, so even small changes could be substantive locally.

Table 3.15-1 Population in the Socioeconomics Study Area and the Block Group Study Area

AREA	2000[1]	2010	2014	ABSOLUTE CHANGE (2010–2014)	% CHANGE (2010–2014)
United States	281,421,906	308,745,538	314,107,084	5,361,546	1.7
Arizona	5,130,632	6,392,017	6,561,516	169,499	2.7
California	33,871,648	37,253,956	38,066,920	812,964	2.2
La Paz County, AZ	19,715	20,489	20,348	–141	–0.7
Maricopa County, AZ	3,072,149	3,817,117	3,947,382	130,265	3.4
Riverside County, CA	1,545,387	2,189,641	2,266,899	77,258	3.5
Socioeconomic Study Area Total	4,637,251	6,027,247	6,234,629	207,382	3.4
Block Group Study Area Total	N/A	21,913	21,710	–203	–0.9

AREA	2000[1]	2010	2014	ABSOLUTE CHANGE (2010–2014)	% CHANGE (2010–2014)
La Paz County, Arizona Block Group Total	—	9,956	9,674	-282	-2.8
Block Group 3, Census Tract 201	—	1,411	1,266	–145	–10.3
Block Group 1, Census Tract 205.01	—	991	1,218	227	22.9
Block Group 2, Census Tract 205.01	—	993	703	–290	–29.2
Block Group 1, Census Tract 205.02	—	1,338	1,360	22	1.6
Block Group 2, Census Tract 205.02	—	1,659	1,257	–402	–24.2
Block Group 3, Census Tract 205.02	—	1,391	1,673	282	20.3
Block Group 1, Census Tract 206.02	—	1,072	633	–439	–41.0
Block Group 2, Census Tract 206.02	—	669	703	34	5.1
Block Group 2, Census Tract 9403	—	432	861	429	99.3
Block Group 1, Census Tract 9800	—	0	0	0	N/A
Maricopa County, Arizona Block Group Total	—	4,536	3,867	-669	-14.7
Block Group 1, Census Tract 506.03	—	1,116	868	–248	–22.2
Block Group 2, Census Tract 506.03	—	2,888	2,382	–506	–17.5
Block Group 3, Census Tract 506.03	—	532	617	85	16.0
Riverside County, California Block Group Total	—	7,421	8,169	748	10.1
Block Group 1, Census Tract 459	—	994	884	–110	–11.1
Block Group 2, Census Tract 459	—	844	693	–151	–17.9
Block Group 2, Census Tract 462	—	1,791	2,197	406	22.7
Block Group 1, Census Tract 469	—	2,043	2,684	641	31.4

AREA	2000[1]	2010	2014	ABSOLUTE CHANGE (2010–2014)	% CHANGE (2010–2014)
Block Group 1, Census Tract 470	—	653	823	170	26.0
Block Group 2, Census Tract 470	—	1,096	888	–208	–19.0

Source: US Census Bureau; 2000 Decennial Census SF1 Table P1; 2010 Decennial Census SF1 Table P1; American Community Survey 2014 5-year estimates B1001; American Community Survey 2014 5-year estimates B01003.
[1]Note that due to changes in population, new census tracts and block groups were created between the 2000 and 2010 Census and thus the block group information is excluded for 2000.

It is important to note that the population data do not reflect the winter visitors and part-time residents in the socioeconomics study area. The census data are collected based on a resident's primary residence, or, for residents who split their time equally between two places, the residence on April 1 of the census year. La Paz County is a major destination for winter visitors and experiences a temporary swell in population during the winter, with the main visitor season occurring from November to March (E. Foster, S. Miller, J. Collier; Town of Quartzsite; personal communication June 28, 2016). During this time, the population of La Paz County is anecdotally reported to grow by tens of thousands of residents who stay in RVs and camp, and these residents are not reflected in the census data. According to Ed Foster, mayor of Quartzsite, the town does not have specific records of temporary long-term visitors, but anecdotal information indicates that the temporary population is an important factor for the local economy and that Quartzsite's economy is highly dependent on these long-term visitors and winter tourism (E. Foster, S. Miller, J. Collier; Town of Quartzsite; personal communication June 28, 2016). Additional information regarding the winter visitor population is provided in Section 3.10.

Much like the declining population of permanent residents in La Paz County, the Quartzsite area has also seen a decline in long-term winter visitors. The aging demographic of the traditional winter visitors and changes to Canadian policies have reduced the number of visitors to the area (L. Goldberg, M. Goldberg, D. Ross; Quartzsite residents/Arizona Sunriders ATV Club; personal communication June 28, 2016). Those who still visit the region seem to stay for shorter periods and split their time with other places that offer more amenities or different activities. Some of the older visitors are being replaced with relatively younger retirees who seek more active recreation options, including the use of OHVs on local trail systems. According to community representatives, preserving these off-road trails and associated activities for visitors is critical to the long-term economic success of the Quartzsite area (L. Goldberg, M. Goldberg, D. Ross; Quartzsite residents/Arizona Sunriders ATV Club; personal communication June 28, 2016).

Local governments provide public services such as police, fire, and emergency medical services; education; and waste management services to the permanent residents, as well as the winter tourists and temporary residents. These services are primarily based out of Quartzsite and Blythe for the residents within the socioeconomics study area. Quartzsite has its own police, fire, and rescue departments, including emergency medical services, and a school district. Waste management services are provided by a couple of private companies; therefore, residents have a choice in their provider. The City of Blythe has its own police department, a volunteer fire department, and an area-wide school district. Several companies provide waste management to the residents in the area. These services are provided to residents and non-residents in the socioeconomics study area, which include the many tourists and temporary residents during the winter months that increase the population as discussed above.

Table 3.15-2 lists the median ages in the socioeconomics study area and the change in this metric over the last decade. In 2014, the median age in Maricopa County was 35.3 years, while in Riverside County it was 34.2 years. However, in La Paz County, the median age was much higher at 54.6 years. Given that the US median age was 37.4 years, the population in La Paz County is much older than the national average, while the populations in Maricopa and Riverside Counties are slightly younger than the national average. Again, these figures do not reflect the long-term winter visitors, many of whom are above the average age for La Paz County.

From 2000 to 2014, the median age increased in all jurisdictions and the median age in the socioeconomics study area increased faster than in the US as a whole. In Maricopa and La Paz Counties, it increased by 7.0 percent and 16.7 percent, respectively, while in Riverside County it increased by 3.3 percent. This compares with an increase of 5.9 percent in the US overall, a rate that is lower than in the Arizona counties but higher than in Riverside County. Data for the block groups in the block group study area are not presented because the block groups have changed since the 2000 Census, and the median age across multiple geographic areas cannot be reliably calculated from the data released.

Table 3.15-2 Median Age in the Socioeconomics Study Area

AREA	2000	2010	2014	% CHANGE (2000–2014)	% CHANGE (2010–2014)
United States	35.3	37.2	37.4	5.9	0.5
Arizona	34.2	35.9	36.5	6.7	1.7
California	33.3	35.2	35.6	6.9	1.1
La Paz County, AZ	46.8	53.9	54.6	16.7	1.3
Maricopa County, AZ	33.0	34.6	35.3	7.0	2.0
Riverside County, CA	33.1	33.7	34.2	3.3	1.5

Source: Census population data from 2000, 2010, and the 2014 American Community Survey 5-year population estimates.

Table 3.15-3 examines population age distribution and its change over time in the socioeconomics study area, in the block group study area, and across the US. The table demonstrates that, except for La Paz County, the largest population group in both 2010 and 2014 was younger working adults ages 18 to 44, while seniors 65 years and older were the smallest population age group. Similar to La Paz County as a whole, the block group study area has a relatively higher share of older population and smaller shares of younger working adults and children than the comparison areas. Since the 2010 Census, the share of the population in the block group study area under age 18 has decreased, while the share of the population 65 years or older has increased. This trend toward an older population decreases the size of the workforce available in this rural area.

Table 3.15-3 Trends in Population Age Distribution by Age Groups in the Socioeconomics Study Area and the Block Group Study Area

AREA	2010 TOTALS				2014 TOTALS				2014 SHARE OF POPULATION (%)			
	17 YEARS AND YOUNGER	18 TO 44 YEARS	45 TO 64 YEARS	65 AND OLDER	17 YEARS AND YOUNGER	18 TO 44 YEARS	45 TO 64 YEARS	65 AND OLDER	17 YEARS AND YOUNGER	18 TO 44 YEARS	45 TO 64 YEARS	65 AND OLDER
United States	74,181,467	112,806,642	81,489,445	40,267,984	73,777,658	114,306,519	82,844,946	43,177,961	23.5	36.4	26.4	13.7
Arizona	1,629,014	2,312,398	1,568,774	881,831	1,620,492	2,360,674	1,605,863	974,487	24.7	36.0	24.5	14.9
California	9,295,040	14,423,538	9,288,864	4,246,514	9,212,288	14,677,650	9,559,075	4,617,907	24.2	38.6	25.1	12.1
La Paz County, AZ	3,678	4,422	5,706	6,683	3,557	4,427	5,363	7,001	17.5	21.8	26.4	34.4
Maricopa County, AZ	1,007,861	1,444,341	902,274	462,641	1,011,479	1,477,926	944,441	513,536	25.6	37.4	23.9	13.0
Riverside County, CA	620,108	804,470	506,477	258,586	616,767	834,712	532,732	282,688	27.2	36.8	23.5	12.5
Block Group Study Area Total	4,798	5,207	5,940	5,968	4,078	5,305	6,009	6,318	18.8	24.4	27.7	29.1
La Paz County, Arizona Block Group Total	1,125	1,435	2,750	4,646	1,141	1,301	2,356	4,876	11.8	13.4	24.4	50.4
Block Group 3, Census Tract 201	172	182	356	701	253	118	251	644	20.0	9.3	19.8	50.9
Block Group 1, Census Tract 205.01	89	87	277	538	252	258	128	580	20.7	21.2	10.5	47.6
Block Group 2, Census Tract 205.01	75	84	312	522	73	67	276	287	10.4	9.5	39.3	40.8
Block Group 1, Census Tract 205.02	89	116	374	759	0	0	402	958	0.0	0.0	29.6	70.4
Block Group 2, Census Tract 205.02	106	145	377	1,031	0	0	89	1,168	0.0	0.0	7.1	92.9
Block Group 3, Census Tract 205.02	102	161	387	741	3	192	461	1,017	0.2	11.5	27.6	60.8
Block Group 1, Census Tract 206.02	245	336	325	166	164	182	219	68	25.9	28.8	34.6	10.7
Block Group 2, Census Tract 206.02	122	169	238	140	138	109	353	103	19.6	15.5	50.2	14.7
Block Group 2, Census Tract 9403	125	155	104	48	258	375	177	51	30.0	43.6	20.6	5.9
Block Group 1, Census Tract 9800	0	0	0	0	0	0	0	0	N/A	N/A	N/A	N/A
Maricopa County, Arizona Block Group Total	1,396	1,436	1,292	412	785	1,345	1,249	488	20.3	34.8	32.3	12.6
Block Group 1, Census Tract 506.03	380	375	278	83	194	284	307	83	22.4	32.7	35.4	9.6
Block Group 2, Census Tract 506.03	836	867	900	285	393	831	838	320	16.5	34.9	35.2	13.4
Block Group 3, Census Tract 506.03	180	194	114	44	198	230	104	85	32.1	37.3	16.9	13.8
Riverside County, California Block Group Total	2,277	2,336	1,898	910	2,152	2,659	2,404	954	26.3	32.5	29.4	11.7
Block Group 1, Census Tract 459	328	303	267	96	275	239	273	97	31.1	27.0	30.9	11.0
Block Group 2, Census Tract 459	300	257	197	90	198	237	136	122	28.6	34.2	19.6	17.6
Block Group 2, Census Tract 462	612	615	384	180	683	698	727	89	31.1	31.8	33.1	4.1
Block Group 1, Census Tract 469	550	653	545	295	517	1,072	722	373	19.3	39.9	26.9	13.9
Block Group 1, Census Tract 470	209	197	155	92	233	234	278	78	28.3	28.4	33.8	9.5
Block Group 2, Census Tract 470	278	311	350	157	246	179	268	195	27.7	20.2	30.2	22.0

Sources: Calculated using data from 2010 Census Data and 2014 American Community Survey 5-year estimates.

The following sections describe population trends, including population totals and age distributions, by census block group adjacent to the Proposed Action and Alternative segments. Compared to the analysis by county, this analysis by block group looks at areas that are closer to the Proposed Action and Alternative segments but might overstate the population in the immediate area that would be affected by the Project. Where relevant, data for towns and CDPs along the Proposed Action and Alternative segments are also included.

Additional details about the population in the block groups along each proposed or alternative segment are provided in the associated baseline report (HDR 2017h, Appendix C). Because new census tracts and block groups were created between the 2000 and 2010 Censuses, only data from 2010 and 2014 are presented in the following sections.

3.15.3.2 Housing

The following overview of housing trends is provided at the county level as well as housing information available at the block group and town levels. Trends in housing stock are examined in terms of the number of housing units in all types of structures: single detached, structures with multiple units, mobile homes, and other types. Note that the housing data include permanent residences only (i.e., site built or manufactured, owner-occupied or rental) and not the RVs and other temporary housing for winter visitors that are largely present in long-term visitor areas and RV parks during the winter.

Table 3.15-4 shows that, from 2000 to 2014, the number of housing units in the socioeconomics study area increased from 1.85 million to about 2.46 million, which is an increase of about 34 percent. The largest portion of this increase occurred in Maricopa and Riverside Counties, which also account for the larger shares of housing units. This increase, however, occurred outside of the vicinity of the Project Area.

Table 3.15-4 also shows the total number of permanent housing units for the block groups in the block group study area. As of 2014, there were 13,750 permanent housing units in these block groups. This accounts for 0.55 percent of the total housing units in the socioeconomics study area, an indication of the rural nature of the socioeconomics study area. The number of housing units the block group study area declined from 2010 to 2014.

Table 3.15-4 Number of Housing Units in the Socioeconomics Study Area and the Block Group Study Area

AREA	2000[1]	2010	2014	ABSOLUTE CHANGE (2010–2014)	% CHANGE (2010–2014)
United States	115,904,641	131,704,954	132,741,033	1,036,079	0.8
Arizona	2,189,189	2,844,526	2,874,548	30,022	1.1
California	12,214,549	13,680,081	13,781,929	101,848	0.7
La Paz County, AZ	15,133	16,049	16,113	64	0.4
Maricopa County, AZ	1,250,231	1,639,279	1,657,753	18,474	1.1
Riverside County, CA	584,674	800,707	810,426	9,719	1.2

AREA	2000[1]	2010	2014	ABSOLUTE CHANGE (2010–2014)	% CHANGE (2010–2014)
Socioeconomics Study Area Total	1,850,038	2,456,035	2,484,292	28,257	1.2
Block Group Study Area Total	—	14,238	13,750	–488	–3.4
La Paz County, Arizona					
Block Group 3, Census Tract 201	—	1,127	967	–160	–14.2
Block Group 1, Census Tract 205.01	—	1,096	698	–398	–36.3
Block Group 2, Census Tract 205.01	—	824	672	–152	–18.4
Block Group 1, Census Tract 205.02	—	1,197	1,179	–18	–1.5
Block Group 2, Census Tract 205.02	—	1,541	1,419	–122	–7.9
Block Group 3, Census Tract 205.02	—	1,344	1,516	172	12.8
Block Group 1, Census Tract 206.02	—	692	580	–112	–16.2
Block Group 2, Census Tract 206.02	—	573	564	–9	–1.6
Block Group 2, Census Tract 9403	—	185	348	163	88.1
Block Group 1, Census Tract 9800	—	0	0	0	N/A
Maricopa County, Arizona					
Block Group 1, Census Tract 506.03	—	465	422	–43	–9.2
Block Group 2, Census Tract 506.03	—	1,369	1,235	–134	–9.8
Block Group 3, Census Tract 506.03	—	227	249	22	9.7
Riverside County, California					
Block Group 1, Census Tract 459	—	413	449	36	8.7
Block Group 2, Census Tract 459	—	375	380	5	1.3
Block Group 2, Census Tract 462	—	659	652	–7	–1.1
Block Group 1, Census Tract 469	—	1,161	1,391	230	19.8
Block Group 1, Census Tract 470	—	379	469	90	23.7
Block Group 2, Census Tract 470	—	611	560	–51	–8.3

Source: US Census Bureau, 2000 Decennial Census, 2010 Decennial Census, and 2014 American Community Survey 5-year estimates. Note that the margin of error is not included in the 2014 estimates.

[1]Note that due to changes in population, new census tracts and block groups were created between the 2000 and 2010 Census and thus the block group information is excluded for 2000.

Trends in housing stock are frequently compared against trends in household formation. The relative magnitude and changes in the two series can provide some insight regarding the housing market situation and possible pressures on the demand (buying) or supply (selling) sides. Table 3.15-5 shows the number of households in 2000, 2010, and 2014. During this time, the number of households in the US and in the block group study area declined, while the number of households in Arizona, California, and the three counties increased slightly. The decline in the number of households nationally despite the increased population is likely due to an increase in the average household size, which suggests that, on average, dwelling units had more people living in them in 2014 than in 2010. In the block group study area, the average household size has generally decreased during this time, as has the overall population.

Table 3.15-5 Number of Households in the Socioeconomics Study Area and the Block Group Study Area

AREA	2000[1]	2010	2014	ABSOLUTE CHANGE (2010–2014)	% CHANGE (2010–2014)
United States	105,480,101	116,716,467	116,211,092	–505,375	–0.4
Arizona	1,901,327	2,380,990	2,387,246	6,256	0.3
California	11,502,870	12,577,498	12,617,280	39,782	0.3
La Paz County, AZ	8,362	9,198	9,707	509	5.5
Maricopa County, AZ	1,132,886	1,411,583	1,424,244	12,661	0.9
Riverside County, CA	506,218	686,260	690,388	4,128	0.6
Socioeconomics Study Area Total	1,647,466	2,107,041	2,124,339	17,298	0.8
Block Group Study Area Total		9,159	8,972	–187	–2.0
La Paz County, Arizona					
Block Group 3, Census Tract 201		684	535	–149	–21.8
Block Group 1, Census Tract 205.01		518	560	42	8.1
Block Group 2, Census Tract 205.01		541	376	–165	–30.5
Block Group 1, Census Tract 205.02		712	775	63	8.8
Block Group 2, Census Tract 205.02		894	836	–58	–6.5
Block Group 3, Census Tract 205.02		797	1,089	292	36.6
Block Group 1, Census Tract 206.02		467	253	–214	–45.8
Block Group 2, Census Tract 206.02		309	318	9	2.9
Block Group 2, Census Tract 9403		151	304	153	101.3
Block Group 1, Census Tract 9800		0	0	0	N/A
Maricopa County, Arizona					
Block Group 1, Census Tract 506.03		342	315	–27	–7.9
Block Group 2, Census Tract 506.03		987	849	–138	–14.0

AREA	2000[1]	2010	2014	ABSOLUTE CHANGE (2010–2014)	% CHANGE (2010–2014)
Block Group 3, Census Tract 506.03		163	199	36	22.1
Riverside County, California					
Block Group 1, Census Tract 459		342	317	–25	–7.3
Block Group 2, Census Tract 459		276	284	8	2.9
Block Group 2, Census Tract 462		584	624	40	6.8
Block Group 1, Census Tract 469		732	710	–22	–3.0
Block Group 1, Census Tract 470		238	280	42	17.6
Block Group 2, Census Tract 470		422	348	–74	–17.5

Source: US Census Bureau, American Community Survey.

[1]Note that due to changes in population, new census tracts and block groups were created between the 2000 and 2010 Census and thus the block group information is excluded for 2000.

Table 3.15-6 shows trends in the average property prices (ownership residential housing units) in the socioeconomics study area as well as overall trends in the US. The table shows that Riverside County had the highest property values in the study area, followed by Maricopa County. These property values tended to be much higher than the US average. The higher property values in both Riverside and Maricopa Counties are skewed by areas that are outside of the immediate Project Area and closer to Los Angeles and Phoenix, respectively.

From 2007 to 2014, property values declined in all of the areas examined here; however, the socioeconomics study area had much greater declines than did the US on average. In Riverside County, property values fell by more than 40 percent; in Maricopa County, they fell by more than 29 percent. La Paz County had a smaller decline of 4.3 percent (though from a much lower base price). This latter decline is similar to the average reduction of 3.4 percent across the US.

Table 3.15-6 Average Ownership Residential Property Value in the Socioeconomics Study Area

YEAR	LA PAZ COUNTY	MARICOPA COUNTY	RIVERSIDE COUNTY	US
2007	$85,500	$248,800	$395,100	$181,800
2010	$100,000	$238,600	$325,300	$188,400
2014	$81,800	$175,600	$236,400	$175,700
Change 2007–2014 (%)	–4.3	–29.4	–40.2	–3.4

Source: US Census Bureau, American Community Survey (3-year and 5-year estimates).

Housing vacancy rates were examined separately for ownership housing and for rental housing, though both rates consider seasonally vacant properties as vacant. Table 3.15-7 shows trends in vacancy rates for Quartzsite and Blythe, each county of the socioeconomics study area, and the states, as well as overall trends across the US.[6]

Across all areas examined, rental vacancy rates were higher than homeowner vacancy rates; this could indicate the seasonality of rental properties in the socioeconomics study area. The vacancy rates calculated by the Census Bureau consider seasonal rentals and homes that are vacant at the time of the survey to be vacant. This could affect the rates shown for the study area, which has many second homes and properties that are left vacant during the summer (E. Foster, S. Miller, J. Collier; Town of Quartzsite; personal communication June 28, 2016). The vacancy rates for both property types in Quartzsite and La Paz County are noticeably higher than the state and national averages, due at least in part to the seasonal nature of housing occupancy in the area.

Table 3.15-7 Vacancy Rates (%) in the Socioeconomics Study Area by Type of Occupancy

AREA	2000		2010		2014	
	OWNER	RENTAL	OWNER	RENTAL	OWNER	RENTAL
United States	1.7	6.8	2.4	9.2	2.1	6.9
Arizona	2.1	9.2	3.9	12.9	3.3	9.2
California	1.4	3.7	2.1	6.3	1.6	4.6
La Paz County, AZ	3.7	14.8	4.9	21.3	3.8	12.4
Maricopa County, AZ	1.8	8.7	4.1	13.7	3.1	9.4
Riverside County, CA	2.5	7.2	3.8	9.5	2.5	7.1
Quartzsite, AZ	3.5	20.2	5.8	19.0	6.4	23.2
Blythe, CA	2.9	14.2	4.0	10.3	2.7	7.7

Source: US Census Bureau, 2000 Decennial Census, 2010 Decennial Census, and 2014 American Community Survey 5-year estimates.

3.15.3.3 Employment

The following data is from the Bureau of Labor Statistics and the Bureau of Economic Analysis (BEA; BEA 2016)—at the county level. The county-level data presented likely does not reflect the exact local conditions in the socioeconomics study area adjacent to the Proposed Action and Alternative segments. The information for La Paz County is likely to best represent the overall study area conditions, since the parts of Maricopa and Riverside Counties in the study area are rural and are more similar to La Paz County than to the urban centers that dominate the Maricopa and Riverside data.

Table 3.15-8 shows trends in total annual employment in the socioeconomics study area from 2001 through 2014. In all three counties, employment peaked in 2007 and declined from 2008 to 2010. Employment started increasing again in 2011. La Paz County, which is the most representative of the study area, has added a net of more than 800 new jobs compared to 2001, but that is still 275

[6] Data for the CDPs in the socioeconomics study area were not reliably available and so are not included.

fewer jobs than the peak in 2008 of 8,173. Employment in La Paz County peaked in 2007 with 8,173 jobs and has not yet returned to pre-recession levels. The annual data compiled by the BEA do not include the seasonal fluctuations associated with Quartzsite; the economy of Quartzsite is seasonal, with many local businesses open for the winter tourist season and closed during the summer (E. Foster, S. Miller, J. Collier; Town of Quartzsite; personal communication June 28, 2016).

Table 3.15-8 also shows that, from 2001 to 2014, employment increased more in Arizona and California (by 21.9 percent and 13.5 percent, respectively) than in the US as a whole (12.3 percent). La Paz County was the only area that had lower employment growth than the national level (at 11.5. percent).

Table 3.15-8 Total Employment in the Socioeconomics Study Area

YEAR	MARICOPA COUNTY	LA PAZ COUNTY	RIVERSIDE COUNTY	COUNTY TOTAL	AZ STATE	CA STATE	US
2001	1,908,689	7,084	677,205	2,592,978	2,840,781	19,411,367	165,519,200
2002	1,923,026	7,192	711,097	2,641,315	2,861,339	19,437,490	165,159,100
2003	1,971,000	7,326	740,535	2,718,861	2,934,459	19,573,490	166,026,500
2004	2,056,808	7,722	790,461	2,854,991	3,063,915	19,876,899	169,036,700
2005	2,189,317	7,914	836,426	3,033,657	3,238,928	20,255,748	172,557,400
2006	2,303,682	8,099	873,513	3,185,294	3,401,000	20,644,868	176,123,600
2007	2,357,669	8,173	884,695	3,250,537	3,494,178	21,040,405	179,885,700
2008	2,323,252	7,882	866,135	3,197,269	3,434,174	20,818,920	179,639,900
2009	2,196,712	7,448	824,279	3,028,439	3,264,077	20,038,208	174,233,700
2010	2,152,299	7,429	814,349	2,974,077	3,208,325	19,803,742	173,034,700
2011	2,206,171	7,576	844,458	3,058,205	3,268,482	20,172,087	176,278,700
2012	2,248,357	7,896	869,508	3,125,761	3,322,733	20,850,443	179,081,700
2013	2,311,453	7,857	903,859	3,223,169	3,398,932	21,496,020	182,390,100
2014	2,362,912	7,898	941,386	3,312,196	3,461,581	22,040,057	185,798,800
Absolute Change 2001–2014	454,223	814	264,181	719,218	620,800	2,628,690	20,279,600
% Change 2001–2014	23.8	11.5	39.0	27.7	21.9	13.5	12.3

Source: Employment by place of work (BEA 2016).

Table 3.15-9 shows trends in unemployment rates in the socioeconomics study area. From 2000 to 2015, Maricopa County had the lowest unemployment rate (below the national rate). The unemployment rates in La Paz and Riverside Counties exceeded the relevant state averages and the national average.

Trends in unemployment rates in the socioeconomics study area were broadly consistent with national trends, with La Paz County exceeding the state and national unemployment rates. During the economic recession, unemployment rates in all of Riverside County exceeded 10 percent, with a peak of 13.8 percent in 2010, compared with rates of less than 10 percent in Maricopa County and the US. The Riverside County unemployment rate declined to 6.7 percent in 2015, but still remains above the US average and the Maricopa County rate. The La Paz County unemployment rate ran around 8 percent during the economic recession of 2008 and rose to a high of about 10 percent in 2010. Since 2010, the unemployment rate in La Paz County has dropped to 7.6 percent, which is higher than the US average and the Arizona average.

Table 3.15-9 Unemployment Rate (%) in the Socioeconomics Study Area

YEAR	MARICOPA COUNTY	LA PAZ COUNTY	RIVERSIDE COUNTY	ARIZONA	CALIFORNIA	US
2000	3.2	6.3	5.4	4.0	4.9	4.0
2001	4.2	6.7	5.5	4.8	5.4	4.7
2002	5.6	6.9	6.4	6.1	6.7	5.8
2003	5.2	7.1	6.5	5.7	6.8	6.0
2004	4.4	6.7	6.0	5.0	6.2	5.5
2005	4.0	6.8	5.4	4.7	5.4	5.1
2006	3.6	5.8	5.0	4.2	4.9	4.6
2007	3.3	5.1	6.0	3.9	5.4	4.6
2008	5.4	7.7	8.6	6.2	7.3	5.8
2009	9.1	9.9	13.1	9.9	11.2	9.3
2010	9.5	10.2	13.8	10.4	12.2	9.6
2011	8.6	9.8	13.2	9.5	11.7	8.9
2012	7.3	8.6	11.6	8.3	10.4	8.1
2013	6.6	8.2	9.9	7.7	8.9	7.4
2014	5.8	7.6	8.2	6.8	7.5	6.2
2015	5.2	7.6	6.7	6.1	6.2	5.3

Source: Local Area Unemployment Statistics (Bureau of Labor Statistics 2016).

Table 3.15-10 show total employment by industry in the socioeconomics study area in 2001 and 2014. The tables demonstrate that the industrial structure of employment and trends in the socioeconomics study area are broadly consistent with the structure and trends in the US overall. The key characteristics of this structure are the following.

- Government or retail trade is the largest employment source in every area examined, with health care and social assistance the second or third largest employment source.
- Except for Maricopa County and the three-county socioeconomic study area, the largest share of employment is in government (Federal, state, and local). In 2014, the share of government services industries was 30 percent in La Paz County and 13.4 percent in

Riverside County, both of which were higher than the 12.9 percent US average (and the 9.5 percent share in Maricopa County).

- The second-largest share of employment was in retail trade and/or health care services, at over 10 percent of total employment (for each geographic area in the table). Between 2001 and 2014, the share of retail trade declined slightly, while the share of health care services increased. After government employment, the largest share of jobs in La Paz County was in the retail trade industry. This indicates the local reliance on retail services and tourism-related industries to support the economy.
- The share of the manufacturing industry in the socioeconomics study area is smaller than the US average (about 5 percent versus 7.5 percent in 2014). Between 2001 and 2014, the number of manufacturing jobs and their relative share of the industry mix decreased in all areas examined here.
- The number of construction jobs also declined from 2001 to 2014 in all areas. The construction industry makes up a larger share of jobs in Riverside County than in any other area considered, though the precise locations of these jobs are unknown and might not be near the block group study area. However, some of these relatively local construction workers might have the appropriate skills to be employed for the construction of this Project.
- The share of the finance and insurance industry in Maricopa County is larger than the share in the other counties and larger than the Arizona share and the US average share. This share increased from 2001 to 2014. There are a limited number of these jobs in La Paz and Riverside Counties, and they are likely in the banking industry. The many finance and insurance industry jobs in Maricopa County are likely in the Phoenix area rather than the part of the county along the Proposed Action and Alternative Segments.
- Farm employment plays a larger role in La Paz County than in the other counties, Arizona, and the US as a whole. As of 2014, farm employment accounted for 4 percent of the total La Paz County employment (314 of 7,898 jobs). The number and share of farming jobs in the area has declined since 2001, though the losses have been smaller than in the comparison areas.
- Note that BEA does not release employment or income data where there is only one entity in the category in that area because releasing that data would inform competitors or potential competitors confidential details about the business. Without this assurance, some businesses may be hesitant to provide the information to the BEA. However, those data are used in summary data, such as total employment for the local area.

Table 3.15-10 Total Employment by Industry in the Socioeconomics Study Area and Percent Change from 2001 to 2014

INDUSTRY	MARICOPA COUNTY			LA PAZ COUNTY			RIVERSIDE COUNTY			COUNTY AREA TOTAL			ARIZONA			CALIFORNIA			US		
	2001	2014	CHANGE (%)	2001	2014	CHANGE (%)	2001	2014	CHANGE (%)	2001	2014	CHANGE (%)	2001	2014	CHANGE (%)	2001	2014	CHANGE (%)	2001	2014	CHANGE (%)
Farm Employment	8,529	6,615	-22.4	344	314	-8.7	11,960	7,634	-36.2	20,833	14,563	-30.1	22,274	31,102	39.6	289,195	243,247	-15.9	3,060,000	2,643,000	-13.6
Nonfarm Employment	1,900,160	2,356,297	24.0	6,994	7,584	8.4	665,245	933,752	40.4	2,572,399	3,297,633	28.2	2,818,507	3,430,479	21.7	19,122,172	21,796,810	14.0	162,459,200	183,155,800	12.7
Private Nonfarm Employment	1,704,578	2,130,888	25.0	4,659	5,188	11.4	562,543	807,517	435.	2,271,780	2,943,593	29.6	2,421,325	2,985,670	23.3	16,508,016	19,180,182	16.2	139,308,200	159,125,800	14.2
Forestry, Fishing, and Related Activities	2,876	2,571	-10.6	(D)	458	N/A	8,932	7,025	-21.4	11,808	10,054	-14.9	18,088	15,492	-14.4	190,088	239,317	25.9	801,500	937,000	16.9
Mining, Quarrying, and Oil and Gas Extraction	3,193	8,248	158.3	(D)	257	N/A	1,029	2,173	111.2	4,222	10,678	152.9	12,888	23,762	84.4	38,070	74,205	94.9	808,400	1,692,000	109.3
Utilities	7,617	7,886	3.5	(D)	(D)	N/A	1,467	1,713	16.8	9,084	9,599	5.7	11,239	12,352	9.9	56,349	60,497	7.4	615,800	582,400	-5.4
Construction	150,723	126,364	-16.2	214	(D)	N/A	69,756	71,017	1.8	220,693	197,381	-10.6	214,198	177,409	-17.2	1,063,005	1,009,359	-5.0	9,816,700	9,610,400	-2.1
Manufacturing	155,861	122,598	-21.3	270	198	-26.7	54,775	46,827	-14.5	210,906	169,623	-19.6	210,914	170,847	-19.0	1,868,376	1,386,726	-25.8	16,921,600	12,993,400	-23.2
Wholesale Trade	85,215	85,817	0.7	128	(D)	N/A	18,493	29,751	60.9	103,836	115,568	11.3	105,127	107,369	2.1	728,229	797,591	9.5	6,233,400	6,419,700	3.0
Retail Trade	215,560	256,466	19.0	1,283	1,277	-0.5	81,254	110,062	35.5	298,097	367,805	23.4	324,514	377,982	16.5	1,954,160	2,037,193	4.2	18,257,800	18,710,900	2.5
Transportation and Warehousing	60,976	74,103	21.5	(D)	234	N/A	16,522	38,198	131.2	77,498	112,535	45.2	81,295	101,125	24.4	575,725	668,898	16.2	5,480,000	6,225,000	13.6
Information	47,301	42,131	-10.9	56	85	51.8	8,382	9,064	8.1	55,739	51,280	-8.0	62,299	54,809	-12.0	629,498	549,517	-12.7	4,047,800	3,302,000	-18.4
Finance and Insurance	126,353	179,595	42.1	71	105	47.9	20,262	34,072	68.2	146,686	213,772	45.7	151,154	216,841	43.5	856,686	1,018,599	18.9	7,800,600	9,833,100	26.1
Real Estate and Rental and Leasing	96,927	164,130	69.3	356	309	-13.2	32,800	61,106	86.3	130,083	225,545	73.4	138,630	221,120	59.5	825,776	1,245,909	50.9	5,548,400	8,135,100	46.6
Professional, Scientific, and Technical Services	123,731	160,720	29.9	152	(D)	N/A	28,428	44,869	57.8	152,311	205,589	35.0	166,130	216,827	30.5	1,529,401	1,894,820	23.9	10,271,800	12,822,700	24.8
Management of Companies and Enterprises	18,513	29,936	61.7	0	0	0.0	3,819	3,712	-2.8	22,332	33,648	50.7	22,669	34,839	53.7	297,056	243,062	-18.2	1,789,300	2,336,000	30.6

INDUSTRY	MARICOPA COUNTY			LA PAZ COUNTY			RIVERSIDE COUNTY			COUNTY AREA TOTAL			ARIZONA			CALIFORNIA			US		
	2001	2014	CHANGE (%)	2001	2014	CHANGE (%)	2001	2014	CHANGE (%)	2001	2014	CHANGE (%)	2001	2014	CHANGE (%)	2001	2014	CHANGE (%)	2001	2014	CHANGE (%)
Administrative and Support and Waste Management and Remediation Services	183,599	217,119	18.3	159	210	32.1	43,648	72,721	66.6	227,406	290,050	27.5	234,265	285,219	21.8	1,232,861	1,456,983	18.2	9,603,500	11,734,900	22.2
Educational Services	22,070	54,792	148.3	(D)	(D)	N/A	6,350	12,015	89.2	28,420	66,807	135.1	32,121	73,887	130.0	322,246	497,758	54.5	3,011,300	4,439,000	47.4
Health Care and Social Assistance	142,412	249,742	75.4	(D)	(D)	N/A	54,924	99,359	80.9	197,336	349,101	76.9	228,350	373,099	63.4	1,512,057	2,418,291	59.9	15,253,400	20,832,900	36.6
Arts, Entertainment, and Recreation	34,899	51,917	48.8	(D)	(D)	N/A	14,945	20,801	39.2	49,844	72,718	45.9	53,903	74,922	39.0	458,087	603,203	31.7	3,165,100	4,149,400	31.1
Accommodation and Food Services	136,587	175,327	28.4	(D)	(D)	N/A	52,469	75,650	44.2	189,056	250,977	32.8	213,261	264,398	24.0	1,247,563	1,601,752	28.4	10,806,200	13,476,300	24.7
Other Services (except Public Administration)	90,165	121,426	34.7	(D)	326	N/A	44,288	67,382	52.1	134,453	189,134	40.7	140,280	183,371	30.7	1,122,783	1,376,502	22.6	9,075,600	10,893,600	20.0
Government and Government Enterprises	195,582	225,409	15.3	2,335	2,396	2.6	102,702	126,235	22.9	300,619	354,040	17.8	397,182	444,809	12.0	2,614,156	2,616,628	0.1	23,151,000	24,030,000	3.8
Total Employment	1,908,689	2,362,912	23.8	7,338	7,898	7.6	677,205	941,386	39.0	2,593,232	3,312,196	27.7	2,840,781	3,461,581	21.9	19,411,367	22,040,057	13.5	165,519,200	185,798,800	12.3

(D) Not shown to avoid disclosure of confidential information, but the estimates for this item are included in the totals.
Note that industry-specific county area total values exclude the non-disclosed values.
Source: Employment by Industry data (Bureau of Economic Analysis 2016).

3.15.3.4 Income

Table 3.15-11 shows average personal income (including earnings, dividends, interest, rent, and transfer payments[7]) per capita (that is, per person) in the socioeconomics study area. The table shows that, from 2001 to 2014, average per-capita personal income in the study area was, with the exception of Maricopa County in 2006, lower than the average for the US overall. The data for Maricopa County reflect the well-paying jobs in the Phoenix metropolitan area, with Maricopa County exceeding the Arizona average every year, while the average for rural La Paz County was consistently well below both the Arizona and US averages. California consistently had higher average per-capita personal income than the US average, but Riverside County's average fell short of both the California and US averages.

Table 3.15-11 Average Per-capita Personal Income in the Socioeconomics Study Area ($)

YEAR	MARICOPA COUNTY	LA PAZ COUNTY	RIVERSIDE COUNTY	ARIZONA	CALIFORNIA	US
2001	30,422	17,732	25,483	27,220	34,091	31,540
2002	30,708	17,820	26,054	27,590	34,306	31,815
2003	31,520	18,787	27,111	28,446	35,381	32,692
2004	33,363	20,434	28,404	30,222	37,244	34,316
2005	35,743	21,583	29,599	32,429	39,046	35,904
2006	38,754	22,338	31,203	34,848	41,693	38,144
2007	39,803	24,620	31,586	35,929	43,182	39,821
2008	39,406	25,017	31,497	36,077	43,786	41,082
2009	36,966	24,635	29,869	34,063	41,588	39,376
2010	37,318	24,872	29,753	34,185	42,411	40,277
2011	39,024	27,553	31,073	35,675	44,852	42,453
2012	40,424	28,344	31,879	36,788	47,614	44,266
2013	40,003	28,255	32,503	36,723	48,125	44,438
2014	41,222	29,219	33,590	37,895	49,985	46,049

Source: CA4 Personal Income and Employment by Major Component (BEA 2016).

In 2014, Maricopa County had the highest average per-capita personal income in the three-county socioeconomic study area at $41,222, followed by Riverside County at $33,590 and La Paz County at $29,219. For the same year, the US average was $46,049. This is an income difference between the US average and averages in the socioeconomics study area of about $4,800 for Maricopa County, about $12,460 for Riverside County, and $16,830 for La Paz County. The per-capita income gap between the counties in the socioeconomics study area and the US has grown over time, from a difference of $13,808 for La Paz County in 2001 to $16,830 in 2014. The gap in Riverside County has doubled from $6,057 in 2001 to $12,459 in 2014. The gap in Maricopa

[7] Transfer payments are government redistribution programs and include Social Security, the Supplemental Nutrition Assistance Program, Women Infants and Children, and other similar programs.

County has grown from $1,118 in 2001 to $4,827 in 2014, even though the county exceeds the state average.

Table 3.15-12 shows the composition of per-capita personal income in terms of three major income components: (1) earnings; (2) dividends, interest, and rent income; and (3) transfer payments. For comparison purposes, the data are shown for 2001 and the most recent year available (2014) for each county in the socioeconomics study area, Arizona, California, and the US.

Earnings generate the largest share of personal income in all geographic areas evaluated here, though the percentage composition varies and has changed over time in all areas. The share of earnings income has decreased, and the share of transfer payment income (including Social Security, Supplemental Nutrition Assistance Program, Women Infants and Children, and other similar programs) has increased, across all geographies.

Of the counties, states, and nation, La Paz County has the lowest share of income from earnings (44.7 percent) and the highest share from transfer payments (36.4 percent). This is a much higher share of transfer payments than in Arizona (20.4 percent) and the US (17.2 percent). The exact cause for the shift is unknown, but two contributing factors could be the overall age of the population in the county (i.e., more retirees collecting social security) and the decrease in the number of jobs during this period.

Table 3.15-12 Average Composition (%) of Per-capita Personal Income in the Socioeconomics Study Area

AREA	2001			2014		
	EARNINGS	DIVIDENDS, INTEREST, AND RENT	TRANSFER PAYMENTS	EARNINGS	DIVIDENDS, INTEREST, AND RENT	TRANSFER PAYMENTS
Us	68.4	18.3	13.3	64.2	18.5	17.2
Arizona	67.3	19.2	13.5	61.4	18.2	20.4
California	70.2	18.3	11.5	64.8	20.1	15.1
La Paz County, AZ	53.1	20.1	26.8	44.7	18.9	36.4
Maricopa County, AZ	71.4	17.9	10.7	65.6	17.6	16.8
Riverside County, CA	66.6	18.1	15.3	64.4	15.7	19.9

Source: Calculated based on personal income data (BEA 2016).

3.15.3.5 Tax Revenues

Similar to employment and income data, tax revenues cannot readily be examined below the county level. For this reason, this information is presented at the county level only, with the information for La Paz County being the most relevant to the study area.

The key components of tax revenues available to local governments (counties and municipalities) are property taxes and sales taxes; sales taxes are formally referred to as transaction privilege, severance, and use taxes. Transaction privilege taxes reflect the state rate imposed on the privilege of conducting business transactions in the state. Severance taxes are taxes in lieu of the transaction privilege tax that are leveraged on the business of mining metalliferous minerals. Use taxes are imposed on the purchase price of tangible personal property when the transaction tax is less than the value of the state transaction privilege tax. Sales taxes are collected by the state government and are distributed to cities and counties based on a complex distribution formula that is mainly based on the size of the permanent population in the receiving jurisdiction. Arizona collects municipal sales taxes on behalf of 76 municipalities to streamline tax collection and reporting requirements for these jurisdictions; these receipts are then distributed to the respective municipalities on a weekly basis.

Table 3.15-13 shows the amounts of sales taxes that were distributed to cities and counties by state governments from 2006 to 2015. The tax distributions are based on permanent population sizes, so the low distribution to La Paz County reflects the small population. The table shows that, in Maricopa and Riverside Counties, tax distributions increased initially (from 2006 to 2007). However, from 2008 to 2010, they decreased each year compared to the previous year. In 2011, tax distributions started increasing again. However, in Maricopa County, they have not fully recovered to the pre-recession 2007 peak. In La Paz County, tax distributions also decreased over the same period but recovered more quickly to the pre-recession level. Municipal distributions to Quartzsite have not recovered to the pre-recession level, while those to Blythe exceeded their pre-recession levels two of the last three years.

Table 3.15-13 Sales Tax Revenues Distributed by State Governments to Cities and Counties in the Socioeconomics Study Area (Millions $)

YEAR	TOTAL CITY AND COUNTY DISTRIBUTIONS			MUNICIPAL DISTRIBUTIONS	
	LA PAZ COUNTY	MARICOPA COUNTY	RIVERSIDE COUNTY	QUARTZSITE, AZ	BLYTHE, CA
2006	2.8	760.5	223.0	0.4	1.4
2007	2.7	810.2	224.0	0.3	1.5
2008	2.6	783.8	212.5	0.3	1.4
2009	2.3	676.1	183.7	0.3	1.3
2010	2.1	621.8	167.8	0.3	1.1
2011	2.2	649.0	178.7	0.3	1.2
2012	2.5	674.9	196.4	0.3	1.2
2013	2.7	706.2	216.4	0.3	1.5
2014	2.9	754.4	229.1	0.3	1.4
2015	2.8	796.7	242.8	0.3	1.5

Sources: Arizona: Compiled from Annual Reports (Arizona Department of Revenue 2016). California: Research and statistics page (California Board of Equalization 2016).

Notes: The reports are for fiscal year and aligned to calendar year (2006 represents FY2005–2006). The municipal distributions are a subset of the total for each county, collected by the state on behalf of the municipality and distributed on a weekly basis. No other municipalities in the block group study area received municipal distributions.

Table 3.15-14 shows property tax revenues in the socioeconomics study area from 2006 to 2015. In La Paz County, tax revenues remained stable or increased over this period; in Maricopa and Riverside Counties, property tax revenues increased until 2009 and then started decreasing. In Maricopa County, property tax revenues reached a bottom minimum in 2013 and increased in 2014 and again in 2015. However, they have not fully recovered to the 2009 peak. In Riverside County, property tax revenues fluctuated somewhat from 2010 to 2013, and by 2015 they exceeded the pre-recession 2009 peak.

Table 3.15-14 Property Tax Revenues in the Socioeconomics Study Area (Millions $)

YEAR	MARICOPA COUNTY	LA PAZ COUNTY	RIVERSIDE COUNTY
2006	3,646.2	16.8	1,826.8
2007	3,981.4	16.9	2,210.2
2008	4,271.1	17.7	2,575.1
2009	4,567.4	19.5	2,627.1
2010	4,401.1	19.7	2,333.8
2011	4,120.6	21.4	2,404.4
2012	4,019.7	21.7	2,258.1
2013	3,995.2	21.8	2,437.3
2014	4,223.1	22.3	2,437.3
2015	4,319.4	22.3	2,635.3

Source: Arizona: Compiled from Annual Reports (Arizona Department of Revenue 2016). California: California Board of Equalization, research and statistics page. For Arizona counties, the reported tax revenues represent the sum of primary and secondary tax revenues as reported in annual reports of the Department of Revenue.

Table 3.15-15 shows assessed property values in the socioeconomics study area from 2006 to 2015 as used for tax calculations. The table shows that property values increased until 2008–2010 (with some differences across the three counties) and then started decreasing. In Maricopa and Riverside Counties, property values started increasing again within the last 2 years (that is, 2014 and 2015), but they have not fully recovered to the pre-recession level. As with the previous real estate discussion, the property values reflect the entire county and not necessarily the area along the Proposed Action and Alternative Segments.

Table 3.15-15 Total Assessed Property Value in the Socioeconomics Study Area (Millions $)

YEAR	MARICOPA COUNTY	LA PAZ COUNTY	RIVERSIDE COUNTY
2006	36,294.7	172.1	164,667.2
2007	49,534.6	200.1	202,526.9
2008	58,303.6	235.1	236,147.7
2009	57,984.1	244.8	239,053.8
2010	49,708.0	245.1	213,500.7
2011	38,760.3	241.4	203,842.1
2012	34,400.5	235.0	199,947.7
2013	32,229.0	224.6	199,947.7
2014	35,079.6	210.7	224,081.1
2015	34,623.7	201.8	224,081.1

Source: Arizona: Compiled from Annual Reports (Arizona Department of Revenue 2016). California: California Board of Equalization, research and statistics page.

While the majority of the Proposed Action and Alternative Segments avoid incorporated and other populated areas, they are located near the Town of Quartzsite, Arizona and the City of Blythe, California. As discussed in Section 3.8, the Town of Quartzsite General Plan details growth areas out to the year 2035 and beyond. None of the Proposed Action segments cross Tier II growth areas, which are indicated in the plan to be used for water, sewer, and roadway expansion. Alternative Segment qn-02 crosses a Town of Quartzsite General Plan Tier III growth area, which is slated for development and town growth in the year 2035 and beyond. However, community members and representatives from the City of Blythe and the Town of Quartzsite have expressed concerns about the transmission line running along I-10 between Quartzsite and Blythe, since the line could affect planned developments in the area (M. Sutterfield, City of Blythe, personal communication June 28, 2016 and E. Foster, S. Miller, J. Collier; Town of Quartzsite; personal communication June 28, 2016).

Payments in Lieu of Taxes from the Federal Government

Payments in lieu of taxes (PILT) are payments made to certain counties by the Federal government to account for losses in property taxes due to the presence of Federally owned land within the county. Federally owned lands are not taxable; therefore, the counties earn no property tax on these lands. 31 USC 69, also known as Public Law 97-258 as amended, established the PILT program, which is administered by the US DOI's Office of the Secretary. The PILT program provides payments to local governments, which assists with their ability to carry out public services such as emergency services and school and road construction. Payments are made to the counties on an annual basis for lands owned by the BLM, the NPS, the USFWS, for Federal water projects, and for some military installations. The formula used to calculate the payments to each county is based on the county population for that year, receipt sharing payments, and the amount in acres of Federal land within the county (DOI 2016).

As discussed in Section 3.8, Federal land accounts for 68 percent of the land base in the Project Area in La Paz, Maricopa, and Riverside Counties. As such, the PILT received by each of the counties in the Project Area is of importance, in addition to the property and sales taxes distributed to each county by the states. The PILT amounts paid to each county between 2000 and 2016 are shown in Table 3.15-16.

Table 3.15-16 Payments in Lieu of Taxes for the Counties in the Socioeconomics Study Area, 2000-2016

YEAR	LA PAZ COUNTY		MARICOPA COUNTY		RIVERSIDE COUNTY	
	ACRES	AMOUNT ($M)	ACRES	AMOUNT ($M)	ACRES	AMOUNT ($M)
2000	1,849,673	0.5	2,299,643	1.0	2,526,533	1.0
2001	1,849,608	0.8	2,299,602	1.5	2,526,041	1.5
2002	1,848,542	0.9	2,299,624	1.5	2,531,559	1.6
2003	1,849,012	1.0	2,307,190	1.7	2,539,871	1.8
2004	1,842,767	1.0	2,456,262	1.8	2,337,931	1.8
2005	1,842,767	1.1	2,458,021	1.8	2,337,255	1.9
2006	1,842,767	1.1	2,457,360	1.9	2,337,025	1.9
2007	1,829,124	1.1	2,457,368	1.8	2,336,944	1.9
2008	1,829,162	1.7	2,456,838	2.9	2,341,522	3.0
2009	1,831,900	1.7	2,440,166	3.0	2,382,390	3.1
2010	1,831,900	1.8	2,440,166	2.7	2,386,342	3.1
2011	1,857,761	1.8	2,441,551	2.7	2,393,259	3.2
2012	1,857,761	1.8	2,441,551	2.8	2,397,320	3.2
2013	1,852,047	1.8	2,441,551	2.8	2,401,623	3.1
2014	1,848,763	1.9	2,434,825	3.0	2,381,909	3.3
2015	1,848,763	1.9	2,434,825	3.0	2,383,212	3.3
2016	1,848,763	1.9	2,434,825	3.1	2,389,185	3.3
Total, all years	$23,901,066		$38,964,309		$42,154,831	
2016 dollars per acre	$1.05		$1.25		$1.40	

Source: Payment in Lieu of Taxes (DOI 2016).

As shown in Table 3.15-16, Maricopa County hosts the largest amount of Federal land in the socioeconomics study area, however, PILT is also calculated based on population and other payments. As of 2016, La Paz County received the lowest payment per acre and Riverside County received the highest; this is likely due to the low population and rural nature of La Paz County and the highly urbanized portions of Riverside County near Los Angeles. Maricopa County, as with its population levels, lies between La Paz and Riverside Counties with regards to the PILT from the Federal government.

3.15.3.6 Nonmarket Values and Ecosystem Services

Non-Market Values

The Proposed Action and Alternative Segments were designed to minimize impacts to urban areas and population centers, though the construction of any new transmission line would alter the natural landscape. These changes in the natural landscape may be noticeable for residents and visitors who place a high value on the natural beauty of the environment, including the beauty of the natural landscape and access to hunting, fishing, and other recreational opportunities, as part of their quality of life. These are considered non-market value resources – those that are not easily quantified or monetized, but may contribute to and affect the economic success of the region. Several economists recognize the importance of both market and non-market values to the overall consideration of land value; while the non-market values are important in areas of outstanding environmental and ecosystem attributes, no local studies have been conducted to attempt to generate dollar values for these amenities (Eftec 2006). Studies have acknowledged a difference between a landholder's total value, which requires both revealed and stated preferences, in addition to the market value of the land. It has been noted that negative impacts to visual resources decreases as the distance from a visual disturbance increases (Eftec 2006).

Scenery and beauty of the natural landscape are important to the environment, communities, people's physical and mental health, and the local economy, with a direct linkage between the perceived benefits of recreation and "quality of life" (Arizona State Parks 2013). While there are no state parks directly within the study area, discussion of the value of open space is relevant to the study area as open spaces boost local economies through tourism and outdoor recreation. This is particularly true, as the nature of traditional rural economies has shifted away from resource extraction and toward relying on the "unspoiled landscapes and abundant wildlife that support recreation and tourism" (Sierra Club 2007). The jobs, tax revenues, and businesses created to support active outdoor recreation are critical to rural communities that rely on tourism (Arizona State Parks 2013; Sierra Club 2007). That said, it is also important to note that the natural amenities alone are not a sufficient catalyst for economic development in many rural counties, and thus any economic development strategies should leverage existing strengths and emerging competitive opportunities (Headwaters Economics 2016).

Ecosystem Services

The nature of the non-market resources in the study area substantially overlaps with the topic of recreation opportunities, which are discussed in Section 3.10, which describes the recreation areas, opportunities for hunting and fishing and other outdoor activities, and resources for OHV use, which are all drivers of the economic viability and success of the study area.

The proposed and alternative routes are within the diverse ecosystem of the Colorado River Basin. Construction of any new infrastructure may alter production or delivery of current levels of ecosystem services to the population, both locally and regionally. As with non-market values, it is difficult to place a monetary value on many ecosystem services. There are four broad categories of ecosystem services:

- **Provisioning services** produce goods such as food, water, and materials. Examples include rivers, forests, and coastal waters.

- **Regulating services** provide the benefit of natural processes that regulate or prevent disease. Examples include climate and soil regulation.
- **Supporting services** provide refuge and reproduction habitat for plants and animals. Examples include genetic resources and habitats.
- **Information services** reflect meaningful interaction between humans and nature. Examples include recreation, spiritual, and aesthetic values (Earth Economics 2014).

While not labeled as such, the current conditions of these ecosystem services are discussed at length in their resource sections and respective baseline technical reports (HDR 2016b-d, 2017a-k). Table 3.15-17 outlines the ecosystem service, its broad category, and the resource section where it is discussed.

Table 3.15-17 Ecosystem Services in the Socioeconomics Study Area

ECOSYSTEM SERVICE	SERVICE CATEGORY	ECOSYSTEM FACTORS	TECHNICAL ENVIRONMENTAL STUDY REFERENCES
Air quality	Regulating services	Ecosystems that mitigate air pollution, such as trees and plants.	Section 3.2, Air Quality and Climate Change discuses baseline air quality.
Climate stability	Regulating services	Ecosystems that filter or store carbon, such as forests, grasslands, shrub ecosystems, and living plants.	Section 3.2, Air Quality and Climate Change discusses greenhouse gas emissions.
Food	Provisioning services	Any biomass for human consumption, including crops, fish and game.	Section 3.5, Biological Resources, discusses vegetation and wildlife. Section 3.8, Land Use, discusses farmland. Section 3.9, Grazing and Rangeland, discusses rangeland and grazing.
Energy and raw materials	Provisioning services	Biological materials used for medicine, fuel, art, or building such as wood, stone, natural gas and fossil fuels.	Section 3.3, Geology, Minerals, and Soil Resources, discusses minerals.
Flood risk reduction	Provisioning services	Ecosystems that provide a buffer against flooding and landslides such as reservoirs.	Section 3.19, Water Resources discusses surface water.
Soils	Regulating services	Ecosystems that provide erosion control measures such as trees, plants, and soil crusts.	Section 3.3, Geology, Minerals, and Soil Resources discusses soils.
Water quality	Regulating services	Ecosystems that provide water filtration, improving water quality for all species.	Section 3.19, Water Resources, discusses surface water quality and groundwater quality.

ECOSYSTEM SERVICE	SERVICE CATEGORY	ECOSYSTEM FACTORS	TECHNICAL ENVIRONMENTAL STUDY REFERENCES
Water regulation	Regulating services	Ecosystems that absorb water during rain, regulating water temperature and flow such as riparian vegetation, wetlands, and built infrastructure.	Section 3.19, Water Resources, discusses Waters of the US, including wetlands, and riparian areas.
Habitat and biodiversity	Supporting services	Existing ecosystem for plants and animals, including present plant and animal species.	Section 3.5, Biological Resources, discusses vegetation and wildlife.
Aesthetic values	Information services	Appearance of and attraction to beautiful natural land.	Section 3.18, Visual Resources, discusses scenic value. Section 3.11, Special Designations, discusses wilderness characteristics.
Recreation and tourism	Information services	Access to recreation and tourism opportunities including parkland, water, hunting and trails.	Section 3.10, Recreation, discusses recreational uses, including hunting and OHV use.

Ecosystem services drive much of the recreation-based economy in the study area, including OHV usage, camping, hiking, wildlife viewing, and hunting. The availability of these resources is critical to the regional economy in the study area, in addition to farther-reaching functions such as carbon cycling, air quality, water quality, and wildlife habitat. Visitors help to support the rural economy near public lands by spending money on services, supplies, lodging, and food while visiting these undeveloped open spaces, with the magnitude of related activity dependent on the number of visitors and existing businesses (National Wildlife Federation 2013; White et al. 2014). Communities located around Federal recreation lands often have a high dependence on spending related to these amenities; those that are highly dependent on recreation spending may have negative economic impacts if participation numbers decline or visitor spending patterns see substantial shifts in the future (White et al. 2014). While there are no studies specifically addressing the economic impacts of these ecosystem resources in the study area, the following section provides context regarding the economic contribution of ecosystem services in the study area related to recreational activities.

3.15.3.7 Tourism and Recreation's Contribution to Local Economies

All three counties in the socioeconomics study area have a range of tourism and recreation resources. These include the following:

- Desert scenery
- OHV designated routes and trails
- Hunting, fishing, and watchable wildlife
- Colorado River/Parker Strip, including several artificial lakes that offer water recreation and sports opportunities

- State parks (including River Island, Buckskin Mountain, Alamo Lake, Anza-Borrego Desert, Chino-Hills, and Lake Perris) that offer scenery and nature viewing, water activities, and camping and hiking opportunities
- Federal public lands managed by the BLM, USFWS and other agencies with a wide range of recreational opportunities for local and non-local visitors
- Municipal parks as well as hiking and biking trails with desert, mountain, and water views
- Golf courses
- Festivals, fairs, entertainment, and shopping
- Ghost towns, which allow visitors to explore local history dating back to the mid-19th century

Statistics on the total number of visitors to the socioeconomics study area and their impact on the local economy have been estimated in several studies. Some of the studies are targeted on specific forms of recreation (i.e., hunting, fishing, wildlife watching, OHV use) and include both residents and non-residents. Other studies focus on non-residents, regardless of their motivation for visiting. This section summarizes multiple studies with an emphasis on those that provide estimates of economic impacts on the three counties that constitute the socioeconomic study area. Note that some recreationists take part in more than one activity during one trip, so the data cannot be added.

The Town of Quartzsite, with its gem shows and swap meets, is a key attraction for tourists during the winter (E. Foster, S. Miller, J. Collier; Town of Quartzsite; personal communication June 29, 2016). In Maricopa County, many biking and hiking trails at Saddle Mountain outside Tonopah attract tourists (S. Hembree, Wild West News [Tonopah], personal communication June 29, 2016). The visitors to these attractions spend money locally, generate business revenues and jobs, and contribute revenues to all levels of government.

Table 3.15-18 presents tourism-related visitor spending and tax revenues for 2014 (Arizona Office of Tourism 2016; Visit California 2016). The table shows that spending ranged from about $137 million in La Paz County to $6.6 billion in Riverside County to $9.5 billion in Maricopa County. To better illustrate the implication of this spending, the table also shows this expenditure in per-resident terms. In La Paz County, visitor spending per resident amounted to nearly $6,800. In Maricopa and Riverside Counties, this per-resident spending was much lower but still well above $2,000 per resident. This demonstrates the importance of recreation- and visitor-based revenue to residents of La Paz County.

Tourism-related tax collections ranged from about $10 million in La Paz County to $557.6 million in Riverside County to $946 million in Maricopa County. To provide additional perspective regarding the relative magnitude of these taxes, in Table 3.15-18 the amount of sales tax distributed to each county by the state government is divided by the sales tax collected to show the percentage of total tax collected that is returned to the local jurisdiction. The table demonstrates that these tourism-related tax receipts by the states are substantially larger than the taxes distributed to each county by the state government. La Paz County receives just under 30 percent of the sales taxes that are levied and Riverside County receives just under 45 percent of the sales taxes collected. The large difference between tax collection and tax distribution in La Paz County reflects the discrepancy between the size of the permanent population (very small) used to calculate tax distributions and the amount of visitor funds entering the local economy.

Table 3.15-18 Tourism-related Visitor Spending and Tax Revenues in the Socioeconomics Study Area, 2014

CATEGORY	LA PAZ COUNTY	MARICOPA COUNTY	RIVERSIDE COUNTY
Visitor Spending, $ Millions	$137.4	$9,500.0	$6,600.0
Visitor Spending per County Resident, $	$6,792	$2,324	$2,834
Total Tourism-related Tax Collected, $ Millions	$10.3	$946.1	$557.6
Tax Distribution as Percentage of Total Sales Tax Collected, %	27.7	79.7	41.1

Source: Based on Interactive County Travel Impacts Reports (Arizona Office of Tourism 2016) and Interactive County Travel Impact Reports (Visit California 2016).

Table 3.15-19 shows employment in 2014 in tourism-related industries that could be directly attributed to serving visitors. The table shows that this employment amounted to 1,385 jobs in La Paz County, 94,200 jobs in Maricopa County, and 72,800 jobs in Riverside County. Although the tourism-related employment in La Paz County was quite small in absolute terms, it accounted for 17.5 percent of the total county employment, which indicates the importance of these industries to the local economy. A different source, using a broader definition of "Tourism and Travel Related" industrial sectors, states that 44.5 percent of employment in La Paz County falls into this category (Headwaters Economics 2017); the source states that the same statistic in Riverside County is 22.4 percent of the workforce, and, in Maricopa County, the states of Arizona and California, and the US, it falls between 15.6 percent and 18.8 percent.

Table 3.15-19 Direct Employment in Tourism-related Industries in the Socioeconomics Study Area, 2014

INDUSTRY	LA PAZ COUNTY	MARICOPA COUNTY	RIVERSIDE COUNTY
Accommodation and Food Services	702	44,800	43,700
Arts, Entertainments, and Recreation	504	18,900	18,700
Retail	173	13,900	6,800
Other Travel	6	7,300	1,800
Ground Transportation	0	6,200	1,500
Visitor Air Transportation	0	3,100	300
Total Tourism-related Jobs	1,385	94,200	72,800
Share of County Employment (%)	17.5	4.0	7.7

Source: Based on Interactive County Travel Impacts Reports (Arizona Office of Tourism 2016) and Interactive County Travel Impact Reports (Visit California 2016).

OHV use contributes substantially to the Arizona economy. A 2003 study by the Arizona State Parks found that OHV usage generated $4 billion in economic impact for the state of Arizona through both direct expenditures for vehicles and equipment, as well as spending in local communities while participating in OHV activities (Arizona State Parks 2003). This study, which randomly sampled more than 15,000 Arizona households on their OHV usage, indicates that in 2002, OHV recreation provided $50 million in economic impact to La Paz County and $1.8 billion in economic impact in Maricopa County. La Paz County values are based on 344,550 OHV recreation days, with $24.6 million spent on equipment and $19.5 million in trip-related spending. Trip-related spending supports jobs and provides tax revenue for the communities surrounding the OHV trails. As OHV recreation increases, economic impacts can also be expected to increase. It should be noted that these values do not include out-of-state visitor spending and are thus conservative estimates of the overall economic impact of OHV usage.

Sightseeing accounted for 21 percent of the OHV usage in La Paz County in 2003, indicating the importance of the natural landscape and ecosystems to the continued regional economy (Arizona State Parks 2003). Beyond OHV usage, general "quiet recreation," including hunting, hiking, viewing, backpacking, wild game viewing, and photography also provide important contributions to the economy (EcoNorthwest 2016). Quiet recreation (defined as "recreation that generally does not involve significant use of motorized equipment aside from any transportation to-and-from the recreation sites") on BLM sites in Arizona accounts for a higher percentage of visits than in the US as a whole, with 63 percent of visitor days in Arizona spent on quiet recreation, compared to 58 percent nationwide, and 72 percent of visits compared to 63 percent nationwide (EcoNorthwest 2016). Direct spending within 50 miles of the recreation site associated with these quiet recreation visits contributed $154.1 million to the Arizona economy in 2014 and $243.9 million to the California economy. This spending and use of the land indirectly support 1,586 jobs in Arizona and 2,605 jobs in California (EcoNorthwest 2016).

Tables 3.15-20 to 3.15-21 show the results of several studies commissioned by the Arizona Game and Fish Department which identify the economic impacts of various forms of outdoor recreation, including hunting, fishing, and "non-consumptive wildlife-related" (defined also as "watchable wildlife") recreation (Southwick Associates 2003). The studies note that more than one of these activities are often incorporated into the same outing so the results from the different activities cannot be added together.

Table 3.15-20 Economic Impacts of Watchable Wildlife Recreation in Arizona in 2001

COUNTY/ STATE	CATEGORY	COUNTY RESIDENTS	AZ RESIDENTS FROM OTHER COUNTIES	NON-RESIDENTS	TOTAL
La Paz	Retail Sales[1]	$174,909	$719,709	$943,094	$1,837,711
	Total Multiplier Effect[2]	$263,960	$1,349,425	$1,812,295	$3,425,680
	Salaries and Wages	$49,068	$380,167	$488,780	$918,015
	Full and Part-Time Jobs (#)	2	13	20	35
	State Sales and Fuel Tax Revenues	$24,137	$39,761	$54,833	$118,732
	State Income Tax Revenues	$1,446	$9,723	$11,284	$22,453
	Federal Income Tax Revenues	$10,174	$68,037	$77,596	$155,807
Maricopa	Retail Sales[1]	$241,010,390	$56,120,457	$71,203,569	$368,334,416
	Total Multiplier Effect[2]	$448,310,508	$105,282,873	$136,828,271	$690,421,651
	Salaries and Wages	$126,269,423	$29,645,607	$36,902,919	$192,817,949
	Full and Part-Time Jobs (#)	4,070	1,016	1,517	6,603
	State Sales and Fuel Tax Revenues	$13,742,406	$3,086,385	$4,139,916	$20,968,707
	State Income Tax Revenues	$3,239,084	$755,328	$851,935	$4,846,347
	Federal Income Tax Revenues	$22,727,975	$5,282,078	$5,858,498	$33,868,552
			AZ Residents	Non-Residents	TOTAL
Arizona	Retail Sales[1] (millions)		$594.5 million	$226.2 million	$820.7 million
	Salaries and Wages (millions)		$312.1 million	$117.3 million	$429.4 million
	Full and Part-Time Jobs		10,235	4,823	15,058
	State Sales Tax Revenues (millions)		$33.6 million	$13.1 million	$46.8 million
	State Income Tax Revenues (millions)		$8.1 million	$2.7 million	$10.8 million
	Federal Income Tax Revenues (millions)		$56.9 million	$18.6 million	$75.5 million
	TOTAL ECONOMIC EFFECT (millions)		$1,100.0	$434.7	$1,500.0

Sources: Tables 3 and 4, "Economic Impact Analysis of Nonconsumptive Wildlife-Related Recreation in Arizona", May 2003, Southwick Associates for the Arizona Game and Fish Department.

[1] Retail Sales includes trip expenditures, such as food, lodging and transportation, and equipment expenditures, including purchases, rentals, entrance fees, and other expenses.

[2] Multiplier effects are the indirect and induced sales, in addition to the direct sales, attributable to the direct sales.

Table 3.15-21 Impacts of Hunting and Fishing in Arizona in 2001 ($Million)

COUNTY/ STATE	CATEGORY	COUNTY RESIDENTS	AZ RESIDENTS FROM OTHER COUNTIES	NON-RESIDENTS	TOTAL
La Paz	Fishing Trip Expenditures ($million)	$1.3	$10.0	$4.6	$15.9
	Hunting Trip Expenditures ($million)	$0.1	$0.4	$0.8	$1.3
	Equipment Expenditures ($million)				$0.6 20.9
	Total Multiplier Effect ($million)				$20.9
	Salaries and Wages ($million)				$4.1
	Full- and Part-Time Jobs (#)				232
	State Tax Revenues ($)				$821,500
Maricopa	Fishing Trip Expenditures ($million)	$63.9	$57.3	$3.2	$124.4
	Hunting Trip Expenditures ($million)	$7.0	$8.9	$1.1	$17.0
	Equipment Expenditures ($million)				$267.7
	Total Multiplier Effect ($million)				$515.0
	Salaries and Wages ($million)				$103
	Full- and Part-Time Jobs (#)				5,382
	State Tax Revenues ($million)				$21.1
		County Residents	AZ Residents	Non-Residents	TOTAL
Arizona	Fishing Trip Expenditures ($million)	$133.5	$242.0	$40.5	$416
	Hunting Trip Expenditures ($million)	$20.6	$38.1	$15.5	$74.2
	Equipment Expenditures ($million)				$467.8
	Total Multiplier Effect ($billion)				$1.34
	Salaries and Wages ($million)				$314
	Full- and Part-Time Jobs (#)				17,190
	State Tax Revenues ($million)				$58.2

Source: "The Economic Importance of Fishing and Hunting", 2001, Jonathan Silberman, PhD., for the Arizona Game and Fish Department.

The ecosystems of the Colorado River and its tributaries also provide noteworthy economic value to the economy of the six surrounding states[8] with nearly four out of ten adults using the river or its tributaries for recreational purposes at least once per year (Southwick Associates 2012). As with OHV usage and other forms of recreation, these visits contribute to job creation, tax revenues and other benefits for the state and regional economies. Within Arizona, more than 57 percent of survey respondents indicated that if the river was not available, their outdoor recreational activities would be affected by either a great or moderate amount (Southwick Associates 2012). This would

[8] Note that California was excluded from this study, as the portion of the economy in the Colorado River basin is small, with limited expected economic contributions to that portion of the state (Southwick Associates 2012).

have a detrimental economic impact, as total economic activity along the river contributes $5.9 billion dollars and 53,508 jobs per year to the Arizona economy (Southwick Associates 2012). While only a small portion of the Colorado River and its tributaries are within the study area, it has been noted that visitors to these outdoor areas often visit more than one location, and changes in availability may have negative economic impacts.

In addition to enjoyment of the landscape and scenery, the wildlife that exist within the open spaces also provides economic contributions through hunting and passive animal interactions (wildlife watching). There were more than 637,000 anglers (fishing), 269,000 hunters, and 1.56 million wildlife watchers in Arizona in 2011, between both residents and non-residents (USFWS 2014b). Expenditures associated with these activities contributed more than $2 billion to the Arizona economy in 2011, with an average spending of $1,767 dollars per year per fishing and hunting spender and an average spending of $751 per year for wildlife watchers (USFWS 2014b).

3.15.3.8 Zone-specific Conditions

The socioeconomic data, as collected by the US Census does not conform well to the zones that are used throughout this Technical Environmental Study for analysis of most resources. For example, because of its shape and location, block group 2 of census tract 205.02 is included in all three Arizona zones, so the four zones will not sum to the total block group study area population in Tables 3.15-1 and 3.15-3. Nevertheless, the data has been interpreted to the zones to the extent possible. Additional socioeconomic data more local to the Project Area is found in Section 3.16, Environmental Justice.

East Plains and Kofa Zone

Population
The block group study area from the East Plains and Kofa Zone includes both Maricopa and La Paz Counties. This geographic area includes the westernmost portion of Maricopa County and the eastern portion of La Paz County. This section of the Proposed Action traverses two census block groups in Maricopa County (block groups 1 and 2 of census tract 506.03) and three in La Paz County (block group 3 of census tract 201, block group 1 of census tract 205.01, and block group 2 of census tract 205.02). The Alternative segments traverse or abut two block groups in Maricopa County (block groups 2 and 3 of census tract 506.03) and four block groups in La Paz County (block group 3 of census tract 201, block group 1 of census tract 205.01, and block groups 2 and 3 of census tract 205.02).

Table 3.15-22 lists the total population in the block groups that abut the various segments. Note that, although these block groups present a more granular representation of the population than do the county-level data, the size of the block group is still larger than the area of effect around the Proposed Action and Alternative segments. Additional discussion of towns in the block group study area and their proximity to the Proposed Action and Alternative segments is provided after the table.

Overall, the population along this section of the Proposed Action and Alternative segments declined between 2010 and 2014, from 9,988 to 9,281 residents within the block groups. Only three block groups in the area had population growth during this time: two in La Paz County and one in Maricopa County. The block groups in Maricopa County had a larger decline in population than did those in La Paz County.

Table 3.15-23 lists the age distribution as of 2014 by block group. Forty-two percent of the population in the block group study area for this section was 65 years or older, mainly as a result of the age of the population in this part of La Paz County.

Table 3.15-22 2010 and 2014 Population by Block Group, East Plains and Kofa Zone

AREA	2010 POPULATION	2014 POPULATION	ABSOLUTE CHANGE	% CHANGE
Tonopah CDP[a]	60	20	–40	–66.7
Brenda CDP[a]	676	416	–260	–38.5
Sunwest CDP[a]	15	2	–13	–86.7
Vicksburg CDP[a]	597	1,025	428	71.7
Maricopa County				
Block Group 1, Census Tract 506.03	1,116	868	–248	–22.2
Block Group 2, Census Tract 506.03	2,888	2,382	–506	–17.5
Block Group 3, Census Tract 506.03	532	617	85	16.0
La Paz County				
Block Group 3, Census Tract 201	1,411	1,266	–145	–10.3
Block Group 1, Census Tract 205.01	991	1,218	227	22.9
Block Group 2, Census Tract 205.02	1,659	1,257	–402	–24.2
Block Group 3, Census Tract 205.02	1,391	1,673	282	20.3
Total Block Group Population	9,988	9,281	–707	–7.1

Source: US Census Bureau; 2010 Decennial Census SF1 Table P1; American Community Survey 2014 5-year estimates B1001 by block group.

[a] CDP included for reference only; not within 0.5 mile of a Proposed Action or alternative segment.

Table 3.15-23 Age Distribution (%) as of 2014 by Block Group, East Plains and Kofa Zone

AREA	17 YEARS AND YOUNGER	18 TO 44 YEARS	45 TO 64 YEARS	65 AND OLDER
Tonopah CDP[a]	0.0	0.0	100.0	0.0
Brenda CDP[a]	0.0	3.8	19.2	76.9
Sunwest CDP[a]	0.0	0.0	0.0	100.0
Vicksburg CDP[a]	24.6	25.2	9.5	40.8
Maricopa County				
Block Group 1, Census Tract 506.03	22.4	32.7	35.4	9.6
Block Group 2, Census Tract 506.03	16.5	34.9	35.2	13.4
Block Group 3, Census Tract 506.03	32.1	37.3	16.9	13.8
La Paz County				
Block Group 3, Census Tract 201	20.0	9.3	19.8	50.9
Block Group 1, Census Tract 205.01	20.7	21.2	10.5	47.6
Block Group 2, Census Tract 205.02	0.0	0.0	7.1	92.9
Block Group 3, Census Tract 205.02	0.2	11.5	27.6	60.8
Total Block Group Age Distribution	13.9	20.6	23.5	42.0

Source: US Census Bureau; American Community Survey 2014 5-year estimates B1001 by block group. Note that the margin of error is not included in the 2014 estimates.

[a] Included for reference only; not within 0.5 mile of a proposed or alternative segment.

The area from the East Plains and Kofa Zone is predominantly rural, and none of the Proposed Action or Alternative segments are within 0.5 mile of a town or CDP. The closest CDPs are Tonopah, Brenda, Vicksburg, and Sunwest, which are included in the tables above for reference. The CDPs Salome and Bouse are also in these block groups but are at the outer edges of the block groups away from the Proposed Action and Alternative segments.

This area has a relatively small wintertime-only or “snow-bird” population compared to other parts of Arizona; there are about 400 RV spaces outside Tonopah (S. Hembree, Wild West News (Tonopah), personal communication June 29, 2016). Much of the population in this zone of the socioeconomics study area is scattered and somewhat isolated. According to community members interviewed, many residents live in this area because the cost of living is generally low. These residents are scattered across the county, which poses economic challenges because as the population ages it may need more services, such as home care (B. Babairs, Western Arizona Council of Governments, personal communication June 29, 2016).

Housing

The block groups in Maricopa and La Paz Counties that include the Proposed Action and Alternative Segments from the East Plains and Kofa Zone had about 6,500 housing units and about 4,400 households as of 2014 (Table 3.15-24). Just over 1,900 of these housing units were in the rural parts of Maricopa County, which is less than 0.1 percent of the housing units in Maricopa County.

The number of housing units and households in the block groups traversed by the Proposed Action segments decreased between 2010 and 2014. This could be due in part to the estimating methods used for the 2014 American Community Survey (ACS).[9] Although the loss of 663 housing units is relatively large, the change in the overall number of households was minor despite the population decrease during this period.

Table 3.15-24 Housing Units and Households by Block Group, East Plains and Kofa Zone

AREA	2010 HOUSING UNITS	2014 HOUSING UNITS	ABSOLUTE CHANGE UNITS	% CHANGE UNITS	2010 HOUSEHOLDS	2014 HOUSEHOLDS	ABSOLUTE CHANGE HOUSEHOLDS	% CHANGE HOUSEHOLDS
Tonopah CDP[a]	30	10	–20	–66.7	29	10	–19	–65.5
Brenda CDP[a]	725	312	–413	–57.0	387	229	–158	–40.8
Sunwest CDP[a]	31	7	–24	–77.4	7	2	–5	–71.4
Vicksburg CDP[a]	687	492	–195	–28.4	285	436	151	53.0
Maricopa County								
Block Group 1, Census Tract 506.03	465	422	–43	–9.2	342	315	–27	–7.9
Block Group 2, Census Tract 506.03	1,369	1,235	–134	–9.8	987	849	–138	–14.0
Block Group 3, Census Tract 506.03	227	249	22	9.7	163	199	36	22.1
La Paz County								
Block Group 3, Census Tract 201	1,127	967	–160	–14.2	684	535	–149	–21.8
Block Group 1, Census Tract 205.01	1,096	698	–398	–36.3	518	560	42	8.1
Block Group 2, Census Tract 205.02	1,541	1,419	–122	–7.9	894	836	–58	–6.5
Block Group 3, Census Tract 205.02	1,344	1,516	172	12.8	797	1,089	292	36.6
Block Group Total	7,169	6,506	–663	–9.2	4,385	4,383	–2	0.0

Source: US Census Bureau, American Community Survey. Note that the margin of error is not included in the 2014 estimates.

[a] Included for reference only; not within 0.5 mile of a proposed or alternative segment.

[9] The ACS is a long-form questionnaire distributed annually to a small percentage of the population on a rotating annual basis and thus provides only a sample of the population. No households receive the survey more than once in a 5-year period. This differs from the decennial census, which captures all residents in the U.S. with a short-form questionnaire. When referencing the ACS, the 5-year estimates are utilized to account for the rotating sample.

Quartzsite Zone

Population

The Quartzsite Zone is entirely within La Paz County. The Proposed Action traverses one block group (block group 2 of census tract 205.02), while the Alternative Segments traverse or abut five block groups in this area (block group 2 of census tract 205.01, block group 1 of census tract 206.02, and block groups 1, 2, and 3 of census tract 205.02).

The census block group adjacent to the Proposed Action in Quartzsite (block group 2 of census tract 205.02) was home to about 1,250 permanent residents as of 2014 (Table 3.15-25). This does not account for long-term winter visitors or other part-time residents. The resident population in this block group has decreased since 2010 and is also substantially older than the population in the remainder of the socioeconomics study area, with nearly 93 percent of residents age 65 or older, which is much higher than the 62 percent average for the block group study area (Table 3.15-26).

Table 3.15-25 2010 and 2014 Population by Area and Block Group, Quartzsite Zone

AREA	2010 POPULATION	2014 POPULATION	ABSOLUTE CHANGE	% CHANGE
Quartzsite Town	3,677	3,646	–31	–0.8
La Paz Valley CDP[a]	699	644	–55	–7.9
La Paz County				
Block Group 2, Census Tract 205.01	993	703	–290	–29.2
Block Group 1, Census Tract 205.02	1,338	1,360	22	1.6
Block Group 2, Census Tract 205.02	1,659	1,257	–402	–24.2
Block Group 3, Census Tract 205.02	1,391	1,673	282	20.3
Block Group 1, Census Tract 206.02	1,072	633	–439	–41.0
Total Block Group Population	6,453	5,626	–827	–12.8

Source: US Census Bureau; 2010 Decennial Census SF1 Table P1; American Community Survey 2014 5-year estimates B1001 by block group.

[a] Included for reference only; not within 0.5 mile of a proposed or alternative segment.

Table 3.15-26 Age Distribution (%) as of 2014 by Area and Block Group, Quartzsite Zone

AREA	17 YEARS AND YOUNGER	18 TO 44 YEARS	45 TO 64 YEARS	65 AND OLDER
Quartzsite Town	0.1	5.3	26.1	68.5
La Paz Valley CDP[a]	0.0	0.0	0.0	100.0
La Paz County				
Block Group 2, Census Tract 205.01	10.4	9.5	39.3	40.8
Block Group 1, Census Tract 205.02	0.0	0.0	29.6	70.4

AREA	17 YEARS AND YOUNGER	18 TO 44 YEARS	45 TO 64 YEARS	65 AND OLDER
Block Group 2, Census Tract 205.02	0.0	0.0	7.1	92.9
Block Group 3, Census Tract 205.02	0.2	11.5	27.6	60.8
Block Group 1, Census Tract 206.02	25.9	28.8	34.6	10.7
Total Block Group Age Distribution	4.3	7.8	25.7	62.2

Source: US Census Bureau; American Community Survey 2014 5-year estimates B1001 by block group.
[a] Included for reference only; not within 0.5 mile of a proposed or alternative segment.

Quartzsite, which was home to about 3,600 permanent residents in 2014, is the main population center in this part of the block group study area. More than two-thirds of the residents living in Quartzsite were over the age of 65. Block group 2 of census tract 205.02 had a much higher proportion of elderly residents than did the town itself, which indicates that many of the older residents lived on the outskirts of town, possibly in more isolated areas.

The population shown does not reflect the winter visitors or the long-term winter residents who frequent Quartzsite for the gem shows and access to OHV trails and other recreation activities. One community member interviewed thought that the average age of these visitors might be decreasing, although the visitors were generally retirees (L. Goldberg, M. Goldberg, D. Ross; Quartzsite residents/Arizona Sunriders ATV Club; personal communication June 28, 2016).

Housing

The block groups in the Quartzsite Zone had about one-third of the housing units and about 34 percent of the households in La Paz County overall as of 2014 (Table 3.15-27). With 3,570 housing units and 2,281 households as of 2014, Quartzsite accounts for two-thirds of the housing units and 68.5 percent of the households in this area. This indicates a heavy concentration of permanent housing within the town boundaries with additional housing throughout the remainder of the block groups. According to the La Paz County Assessor, the number of households in the areas of Rainbow Acres, La Paz Valley, and Quartzsite has grown (S. Schuler and D. Jones, La Paz County Assessor's Office, personal communication June 28, 2016).

Table 3.15-27 Housing Units and Households by Area and Block Group, Quartzsite Zone

AREA	2010 HOUSING UNITS	2014 HOUSING UNITS	ABSOLUTE CHANGE UNITS	% CHANGE UNITS	2010 HOUSEHOLDS	2014 HOUSEHOLDS	ABSOLUTE CHANGE HOUSEHOLDS	% CHANGE HOUSEHOLDS
Quartzsite Town	3,378	3,570	192	5.7	2,027	2,281	254	12.5
La Paz Valley CDP[a]	695	544	–151	–21.7	370	419	49	13.2
La Paz County								
Block Group 2, Census Tract 205.01	824	672	–152	–18.4	541	376	–165	–30.5

AREA	2010 HOUSING UNITS	2014 HOUSING UNITS	ABSOLUTE CHANGE UNITS	% CHANGE UNITS	2010 HOUSEHOLDS	2014 HOUSEHOLDS	ABSOLUTE CHANGE HOUSEHOLDS	% CHANGE HOUSEHOLDS
Block Group 1, Census Tract 205.02	1,197	1,179	–18	–1.5	712	775	63	8.8
Block Group 2, Census Tract 205.02	1,541	1,419	–122	–7.9	894	836	–58	–6.5
Block Group 3, Census Tract 205.02	1,344	1,516	172	12.8	797	1,089	292	36.6
Block Group 1, Census Tract 206.02	692	580	–112	–16.2	467	253	–214	–45.8
Block Group Total	5,598	5,366	–232	–4.1	3,411	3,329	–82	–2.4

Source: US Census Bureau, American Community Survey. Note that the margin of error is not included in the 2014 estimates.

[a] Included for reference only; not within 0.5 mile of a proposed or alternative segment.

Copper Bottom Zone

Population

This section of the block group study area extends west from Quartzsite to the Arizona–California border and, for the purposes of this report, is referred to as the Copper Bottom Zone though there are no known residents in Copper Bottom Pass. The Proposed Action segments through the Copper Bottom Zone traverse two census block groups (block group 2 of census tract 205.02 and block group 2 of census tract 206.02), while the Alternative segments are adjacent to four block groups (block group 2 of census tract 205.02, block group 2 of census tract 206.02, block group 2 of census tract 9403, and block group 1 of census tract 9800).

This zone is entirely within La Paz County. Within this area are the CRIT Reservation, the YPG, and the CDP Ehrenberg. Information about the racial profile of the full socioeconomics study area is provided in the Environmental Justice Baseline Technical Report (HDR 2016d), while additional information about the Native American populations in the socioeconomics study area is provided in the Section 3.7. The YPG is military land and Proposed Action Segment p-09 crosses its northeast corner. This area (block group 1 of census tract 9800) has no population, which is represented by either 0 or N/A in the tables.

The population of the Copper Bottom Zone (from Quartzsite to the Colorado River) was 2,821 residents as of 2014 (Table 3.15-28). This is a small increase over the population in 2010. Overall, the Copper Bottom Zone had a relatively high proportion of residents over age 65, at 47 percent of the total population in the area (Table 3.15-29). This percentage was largely driven by the inclusion of a small portion of block group 2 in census tract 205.02. When this portion of census tract 205.02 is removed, the age distribution more closely reflects that in Ehrenberg, with 10 percent of residents over 65 and 65 percent between the ages of 18 and 64.

Table 3.15-28 2010 and 2014 Population by Area and Block Group, Copper Bottom Zone

AREA	2010 POPULATION	2014 POPULATION	ABSOLUTE CHANGE	% CHANGE
Ehrenberg CDP	1,470	1,017	–453	–30.8
La Paz County				
Block Group 2, Census Tract 205.02	1,659	1,257	–402	–24.2
Block Group 2, Census Tract 206.02	669	703	34	5.1
Block Group 2, Census Tract 9403	432	861	429	99.3
Block Group 1, Census Tract 9800	0	0	0	N/A
Total Block Group Population	2,760	2,821	61	2.2

Source: US Census Bureau; 2010 Decennial Census SF1 Table P1; American Community Survey 2014 5-year estimates B1001 by block group.

Table 3.15-29 Age Distribution (%) as of 2014 by Area and Block Group, Copper Bottom Zone

AREA	17 YEARS AND YOUNGER	18 TO 44 YEARS	45 TO 64 YEARS	65 AND OLDER
Ehrenberg CDP	23.2	26.6	39.1	11.0
La Paz County				
Block Group 2, Census Tract 205.02	0.0	0.0	7.1	92.9
Block Group 2, Census Tract 206.02	19.6	15.5	50.2	14.7
Block Group 2, Census Tract 9403	30.0	43.6	20.6	5.9
Block Group 1, Census Tract 9800	0.0	0.0	0.0	0.0
Total Block Group Age Distribution	14.0	17.2	21.9	46.9

Source: US Census Bureau; American Community Survey 2014 5-year estimates B1001 by block group.

This section of the block group study area is the entryway to Arizona from California and is home to the CDP Ehrenberg. Several alternatives, including Segments i-07 and i-08, traverse the CDP. The population of Ehrenberg is declining, down more than 400 residents between 2010 and 2014. Ehrenberg's population is also relatively young compared to other parts of the block group study area, with two-thirds of the population between 18 and 64 years old in 2014.

Housing

The block groups around the Copper Bottom Zone had 2,331 housing units and 1,458 households as of 2014 (Table 3.15-30). This area includes a block group with CRIT lands (block group 2 of census tract 9403), though there is no housing in the area surrounding the Proposed Action and Alternative Segments. This area also contains the Ehrenberg CDP, which had 908 housing units and 432 households as of 2014. The total number of housing units and households in the block groups increased from 2010 to 2014, with much of this increase occurring in block group 2 of census tract 9403 well away from the Project Area.

Table 3.15-30 Housing Units and Households by Area and Block Group, Copper Bottom Zone

AREA	2010 HOUSING UNITS	2014 HOUSING UNITS	ABSOLUTE CHANGE UNITS	% CHANGE UNITS	2010 HOUSEHOLDS	2014 HOUSEHOLDS	ABSOLUTE CHANGE HOUSEHOLDS	% CHANGE HOUSEHOLDS
Ehrenberg CDP	948	908	–40	–4.2	645	432	–213	–33.0
La Paz County								
Block Group 2, Census Tract 205.02	1,541	1,419	–122	–7.9	894	836	–58	–6.5
Block Group 2, Census Tract 206.02	573	564	–9	–1.6	309	318	9	2.9
Block Group 2, Census Tract 9403	185	348	163	88.1	151	304	153	101.3
Block Group 1, Census Tract 9800	0	0	0	N/A	0	0	0	N/A
Block Group Total	2,299	2,331	32	1.4	1,354	1,458	104	7.7

Source: US Census Bureau, American Community Survey. Note that the margin of error is not included in the 2014 estimates.

Colorado River and California Zone

Population

In the Colorado River and California Zone, the California portion of the block group study area is located entirely in Riverside County. The Proposed Action traverses two census block groups (block group 2 of census tract 459 and block group 1 of census tract 469) while the Alternative segments traverse up to six block groups, depending on their location (block groups 1 and 2 of census tract 459, block group 2 of census tract 462, block group 1 of census tract 469, and block groups 1 and 2 of census tract 470). This part of the block group study area includes the City of Blythe, the CDP Ripley, and the CDP Mesa Verde.

The City of Blythe is home to 20,101 residents as of 2014, a slight decrease from the 2010 population. Only a small portion of the City of Blythe is contained within the block group study area, with portions of the city contained in block group 2 of census tract 462, block group 1 of census tract 469, and block groups 1 and 2 of census tract 470.

The block group study area was home to 8,169 residents as of 2014. This is an overall increase of 748 residents, or 10 percent, from the population in 2010 **(**Table 3.15-31**)**. Overall, this part of the block group study area was younger than the population on the Arizona side. Sixty-two percent of the population was of working age (18 to 64), while only 11 percent was over the age of 65 (**Table 3.15-32**). This area had a larger percentage of young residents under than age of 18 than did other sections of the block group study area and was the most similar to the larger comparison areas such as Riverside County and the US as a whole.

Table 3.15-31 2010 and 2014 Population by Area and Block Group, Colorado River to California Zone

AREA	2010 POPULATION	2014 POPULATION	ABSOLUTE CHANGE	% CHANGE
Blythe City	20,817	20,101	–716	–3.4
Ripley CDP	692	659	–33	–4.8
Mesa Verde CDP	1,023	1,004	–19	–1.9
Riverside County				
Block Group 1, Census Tract 459	994	884	–110	–11.1
Block Group 2, Census Tract 459	844	693	–151	–17.9
Block Group 2, Census Tract 462	1,791	2,197	406	22.7
Block Group 1, Census Tract 469	2,043	2,684	641	31.4
Block Group 1, Census Tract 470	653	823	170	26.0
Block Group 2, Census Tract 470	1,096	888	–208	–19.0
Total Block Group Population	7,421	8,169	748	10.1

Source: US Census Bureau; 2010 Decennial Census SF1 Table P1; American Community Survey 2014 5-year estimates B1001 by block group.

Table 3.15-32 Age Distribution (%) as of 2014 by Area and Block Group, Colorado River to California Zone

AREA	17 YEARS AND YOUNGER	18 TO 44 YEARS	45 TO 64 YEARS	65 AND OLDER
Blythe City	17.4	43.7	30.9	7.9
Ripley CDP	30.0	34.0	17.5	18.5
Mesa Verde CDP	32.6	21.6	29.7	16.1
Riverside County				
Block Group 1, Census Tract 459	31.1	27.0	30.9	11.0
Block Group 2, Census Tract 459	28.6	34.2	19.6	17.6
Block Group 2, Census Tract 462	31.1	31.8	33.1	4.1
Block Group 1, Census Tract 469	19.3	39.9	26.9	13.9
Block Group 1, Census Tract 470	28.3	28.4	33.8	9.5
Block Group 2, Census Tract 470	27.7	20.2	30.2	22.0
Total Block Group Age Distribution	26.3	32.5	29.4	11.7

Source: US Census Bureau; American Community Survey 2014 5-year estimates B1001 by block group.

Within this zone is the City of Blythe, which is the largest population center in the block group study area, though the city extends beyond the study area. As of 2014, there were about 20,000 residents in Blythe, which is a slight decline from 2010. Nearly three-quarters of these residents were working age, while less than 8 percent were over the age of 65. This area is also home to the 659 residents of Ripley, California. The population of Ripley declined slightly between 2010 and 2014, and there were larger percentages of residents under the age of 18 and over the age of 65 than in Riverside County as a whole.

Housing

The block groups in the California section of the block group study area had 3,901 housing units and 2,563 households as of 2014 (Table 3.15-33). This is 0.48 percent of the housing units and 0.37 percent of the households in Riverside County. From 2010 to 2014, the overall number of housing units increased, with all but two block groups adding new units. The area had slightly fewer households in 2014 than in 2010, though this might be partially due to the margin of error in the 2014 estimates.

Although only part of Blythe is within the block group study area,[10] the overall number of housing units and households in the city increased from 2010 to 2014. The Ripley CDP also had an increase in the number of households and housing units during this period.

Table 3.15-33 Housing Units and Households by Area and Block Group, Colorado River to California Zone

AREA	2010 HOUSING UNITS	2014 HOUSING UNITS	ABSOLUTE CHANGE UNITS	% CHANGE UNITS	2010 HOUSEHOLDS	2014 HOUSEHOLDS	ABSOLUTE CHANGE HOUSEHOLDS	% CHANGE HOUSEHOLDS
Blythe City	5,473	6,106	633	11.6	4,513	5,019	506	11.2
Ripley CDP	295	321	26	8.8	218	256	38	17.4
Mesa Verde CDP[a]	360	386	26	7.2	312	342	30	9.6
Riverside County								
Block Group 1, Census Tract 459	413	449	36	8.7	342	317	–25	–7.3
Block Group 2, Census Tract 459	375	380	5	1.3	276	284	8	2.9
Block Group 2, Census Tract 462	659	652	–7	–1.1	584	624	40	6.8
Block Group 1, Census Tract 469	1,161	1,391	0	0.0	732	710	–22	–3.0
Block Group 1, Census Tract 470	379	469	90	23.7	238	280	42	17.6
Block Group 2, Census Tract 470	611	560	–51	–8.3	422	348	–74	–17.5
Block Group Total	3,598	3,901	73	2.0	2,594	2,563	–31	–1.2

Source: US Census Bureau, American Community Survey. Note that the margin of error is not included in the 2014 estimates.

[a] Included for reference only; not within 0.5 mile of a proposed or alternative segment.

[10] There are more housing units and households in Blythe than in all of this section of the block group study area. Blythe includes additional block groups that are not within 0.5 mile of any of the proposed or alternative segments.

3.15.3.9 Summary

Overall, the block group areas along the Proposed Action and Alternative segments are economically depressed when compared with the county, state, and country as a whole. The Proposed Action and Alternative segments have generally been designed to follow existing ROWs and avoid population centers and sensitive socioeconomic areas, though some of the Alternative segments cross near population centers in Quartzsite and Blythe.

Winter tourism and recreation play a substantial role in the economy of the socioeconomics study area, particularly in La Paz County, which is the most representative of the Project Area out of the three counties. Although precise data are difficult to locate, the RV parks and the BLM's LTVAs house thousands of temporary residents during the winter months (Wolinsky 2016). These visitors are essential to the local economy; however, they are not included in population estimates due to their temporary presence in the area.

Conclusions for each county with regards to socioeconomic trends are discussed below.

La Paz County

- The number of permanent residents in La Paz County has decreased slightly since 2010, with nearly all of the block groups in the socioeconomics study area losing residents between 2010 and 2014. In addition to the decline in the number of permanent residents, there has been a noticeable decline in the number of long-term winter visitors to the Quartzsite area (L. Goldberg, M. Goldberg, D. Ross; Quartzsite residents/Arizona Sunriders ATV Club; personal communication June 28, 2016). These winter visitors use town and county resources, though they are not counted in the population estimates.
- The economies of the county and the Town of Quartzsite depend heavily on tourism, with many businesses in Quartzsite open only during the winter, when tourism peaks. Because of the importance of tourism to the local economy, efforts are underway to increase the number of activities available, including the proposed Arizona Peace Trail, to maintain and attract the changing demographic of visitors (L. Goldberg, M. Goldberg, D. Ross; Quartzsite residents/Arizona Sunriders ATV Club; personal communication June 28, 2016).
- There is a rapidly aging population in the county. The median age is much higher than in the other counties in the socioeconomics study area and in the US, with a rapidly growing share of seniors in the total population. In one block group, 93 percent of the population is over age 65. The aging population and rural nature of the area present challenges for resource allocation (B. Babairs, Western Arizona Council of Governments, personal communication June 29, 2016).
- Total employment is still recovering to the pre-recession level (2007), and the unemployment rate is above the US average. The aging demographic decreases the size of the labor force. The rural nature of the county is not attractive to large employers, so government and retail services are the primary employers in the county.
- Average per-capita personal incomes are much lower than in the other counties, Arizona, and the US. The aging demographic and sparse employment opportunities in the county

lead to a larger share of per-capita personal income being generated by transfer payments (as opposed to wage earnings) than in any other area evaluated.

Maricopa County

- From 2000 to 2010, Maricopa County, including the relatively small, rural part of the county in the block group study area, had relatively high population growth compared to the US. While the urban areas of the county have continued to grow at a slower rate, the population in Tonopah and around the Delaney Substation has declined.
- The population in the county is somewhat younger than the US average. The population exhibits a lower median age and a higher share of younger population groups (children, youth, and young adults). The block group study area population in Maricopa County trends older than the county as a whole, with a median age around 40 compared to the county median age of 35.3 and the US median age of 37.4.
- Total employment only recently returned to the pre-recession level (2007), but the unemployment rate is slightly below the US average. The recovery might not have reached the rural study area, though Tonopah benefits from its proximity to the Palo Verde nuclear plant and a recently opened Hickman Egg Farm and other agricultural and dairy employers (S. Hembree, Wild West News (Tonopah), personal communication June 29, 2016).
- Average per-capita personal incomes are somewhat lower than the US average, and the gap between the county and US averages has been growing in recent years. Much of the wage income in the county is driven by the professional services employers in the Phoenix area rather than by employers in the rural study area.
- Tax revenues are somewhat below their pre-recession peak, and decreased property values have reduced the local governments' incoming revenues.

Riverside County

- Riverside County had high population growth in the early to mid-2000s compared to the US average, though this growth slowed substantially in recent years. Although the population in the block group study area in Riverside County has increased overall, this increase has been slower than in the county, California, and the US. The largest population center in the block group study area, the city of Blythe, declined in population between 2010 and 2014. The Blythe area and other areas along the Colorado River house some long-term visitors, primarily from Canada, who are not included in the population data. These visitors primarily come for recreation activities such as dove and quail hunting, fishing, and boating (M. Sutterfield, City of Blythe, personal communication June 28, 2016).
- Riverside County has a slightly younger population than California and the US, with a median age of 34.2 years compared to California's 35.2 years and the US' 37.4 years. However, for the six block groups within the block group study area in Riverside County, the median age is slightly higher, with median ages between 32 and 48.4 years. The Riverside County block group study area has a higher total proportion of working-age adults (between 18 and 64) than the other two county block group study areas, which creates a larger employment base.
- Total employment just recovered to pre-recession levels (2007), but the unemployment rate remains relatively high and above the US average. Although agriculture has historically

been a large employer in the Blythe area, the industry is in decline. The city has entered an agreement with the Metropolitan Water District to fallow (i.e., leave uncultivated) up to 30 percent of agricultural land each year, and this agreement accounts for some of the decline (M. Sutterfield, City of Blythe, personal communication June 28, 2016). The “solar boom” has helped stabilize the economy in Blythe, though development of new solar projects has slowed recently (M. Sutterfield, City of Blythe, personal communication June 28, 2016).

- Average per-capita personal incomes in Riverside County are lower than both the California and US averages. The gap between the county and US averages more than doubled from 2001 to 2014. Although the share of personal income from earnings is similar to the California and US averages, the share of income from transfer payments (19.9 percent) is higher than in both California (15.1 percent) and the US (17.2 percent). This reflects a lower percentage of personal income from dividends, interest, and rent.
- Tax revenues are just recovering to their pre-recession levels (in terms of nominal dollars), with the county experiencing decreased property values. The decrease in property values affects both the property owners and the tax revenues available to the county and state.

3.16 ENVIRONMENTAL JUSTICE

3.16.1 Applicable Laws, Regulations, Policies, and Plans

3.16.1.1 Federal

EO 12898 requires that “each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations” (EO 12898, Section 1-101), EO 12898 requires Federal agencies to evaluate and document the potential impacts of Federal actions on the human health and environmental conditions in minority, tribal, and low-income communities. These potential impacts are usually referred to as “EJ issues” and/or “EJ concerns”.

BLM’s Land Use Planning Handbook, H-1601-1, Appendix D, Section IV, outlines BLM’s EJ principles and describes how to incorporate EJ analysis efforts in the NEPA process. BLM H-1601-1 recommends considering aggregate, cumulative, and synergistic effects, including results of actions taken by other parties, when determining if there are environmental justice concerns with any given project.” EO 12898 requires that Federal agencies assess whether a project will have adverse and/or disproportionately high environmental impacts on minority or low-income populations (“environmental justice” impacts). EJ issues require specific analysis as defined in EO 12898. This EO was designed to focus the attention of Federal agencies, such as the BLM, on avoiding discrimination in Federal actions. EO 12898 requires Federal agencies to evaluate and document the potential impacts of Federal actions on the human health and environmental conditions in minority, tribal, and low-income communities.

BLM’s Land Use Planning Handbook, H-1601-1, Appendix D, Section IV outlines EJ principles and incorporates EJ efforts in the NEPA process.

3.16.2 Study Area

The EJ study area is a 1-mile corridor encompassing the Proposed Action and Alternative segments (Appendix 1, Figure 3.15-1). The study area includes the study area and all census block groups crossed by the Proposed Action and Alternative segments. This study area was designated due to the linear nature of the Proposed Action, and is intended to include all adjacent and nearby communities that may be impacted

Data from the US Census Bureau's ACS 5-year Estimates for 2010 to 2014 are presented for total population, poverty, and minority populations. Census data for both block groups (Appendix 1, Figure 3.15-1) and CDPs are included. Block groups include data for an area containing between 600 and 3,000 people. Data for CDPs provides information regarding a settled population identifiable by name but not legally incorporated. There is no maximum population number for a CDP. Data for incorporated cities as well as the states of Arizona and California are also provided.

The most reliable data for demography and personal income is maintained by the Census Bureau at the census block group level. These areas do not coincide with the zones used for analysis of the other resources in this Technical Environmental Study. Consequently, the EJ analysis areas will differ somewhat compared to those of the other resources.

Data required for this assessment were collected from US Census Bureau databases through the American Fact Finder online tool (US Census Bureau 2016), which allows users to find and download community-level socioeconomic and demographic data for various levels of geographic aggregation. Census block groups potentially affected by the Project were identified through GIS mapping of the Proposed Action and Alternative segments by delineating the area within 0.5 mile of the segments (i.e., the EJ study area).

Census block groups are generally larger in geographic area than a study corridor of 0.5 mile on either side of the Proposed Action and Alternative segments. In rural, low-population areas, the block groups are geographically larger than in urban centers and, therefore, may include large expanses of unpopulated lands. Since it is possible that the demographic information for a block group as a whole does not represent the conditions in the study corridors adjacent to the Proposed Action and Alternative segments, assessment of the actual populations of a block group that are within the corridor is accomplished using aerial imagery to determine the presence or absence of residential or commercial structures within, or in close proximity to, the study area. The block groups included in the analysis of the EJ study area are shown in Figure 3.15-1 (Appendix 1).

To provide a basis for comparing the individual block groups along the Proposed Action and Alternative segments, a reference population was identified to be the sum of the three counties crossed by the Proposed Action and Alternative segments. This reference population was used to compare with individual block groups in order to identify populations along the Proposed Action and Alternative segments with relatively higher minority and low-income representation. This reference population is referred to as the EJ comparison area. Additionally, individual county, Census county division (CCD)-level, and CDP-level data from the US Census Bureau were reviewed.

The percentages of low-income and minority populations in the EJ comparison area were used as thresholds to compare with the percentages of low-income and minority populations in the individual block groups. Block groups with minority or low-income percentages that were more than 10 percent higher than in the EJ comparison area were considered "meaningfully greater than" the general population and were considered EJ populations. Additionally, block groups with over 50 percent minority populations are considered EJ populations.

Block group data cover only permanent residents within a particular geographic area. The BLM LTVAs and private RV parks in and around Quartzsite may have seasonal populations not captured in the current US Census Bureau data. Some of these part-time residents in the Quartzsite area may stay longer than the winter and have children who attend local schools (Ron Morfin, BLM, August 18, 2016). However, these seasonal populations are not documented through the US Census Bureau. Consequently, such low income or minority seasonal residents would not be captured in this analysis.

For the purpose of this assessment, minority populations include individuals who identify themselves as belonging to one of the following racial or ethnic background groups as defined by the CEQ (1997):

- Hispanic or Latino,
- Black or African American (non-Hispanic),
- American Indian and Alaska Native (non-Hispanic),
- Asian (non-Hispanic), and
- Other racial category, which includes the non-Hispanic Census Bureau categories of Native Hawaiian and other Pacific Islander; some other race; and two or more races.

Low-income population groups were defined as individuals living in households with household income below the poverty level as defined in US Census Bureau poverty status statistics. The poverty threshold varies depending on the size of the family and number of children in the household. For households with one adult under age 65, the poverty threshold in 2014 was an annual income of $12,316. For a family of two adults and two children, the poverty threshold was $24,008 in 2014. The data used considered the appropriate poverty level for the sampled population to identify potential EJ populations.

3.16.3 Existing Conditions

3.16.3.1 Block Groups

The block groups within 0.5 mile on either side of the Proposed Action and Alternative segments comprise the EJ study area (Appendix 1, Figure 3.15-1). Table 3.16-1 lists the EJ study area block groups and how they relate to the Proposed Action and Alternative segments.

Table 3.16-1 Environmental Justice Study Area Block Groups and Associated Proposed Action and Alternative Segments

BLOCK GROUP	PROPOSED SEGMENT WITHIN BLOCK GROUP	ALTERNATIVE SEGMENT WITHIN BLOCK GROUP
Maricopa County, Arizona		
Block Group 1, Census Tract 506.03	p-01	None[a]
Block Group 2, Census Tract 506.03	p-01	d-01
Block Group 3, Census Tract 506.03	None[a]	None[a]
La Paz County, Arizona		
Block Group 3, Census Tract 201	p-01 to p-06	d-01, x-01, x-02a, x-02b, x-03, x-04, i-01, i-02, i-03, i-04
Block Group 1, Census Tract 205.01	p-06	x-04, x-05, x-06, i-03, i-04, i-05, in-01
Block Group 2, Census Tract 205.01	None[a]	in-01
Block Group 1, Census Tract 205.02	None	qn-02
Block Group 2, Census Tract 205.02	p-06 to p-10	qs-01, qs-02, cb-01, x-05, x-06, x-07, i-05, i-06
Block Group 1, Census Tract 206.02	None[a]	None[a]
Block Group 3, Census Tract 205.02	None[a]	in-01, qn-01, qn-02
Block Group 2, Census Tract 206.02	p-10 to p-15e	x-08, i-06, i-07, i-08s, cb-01, cb-02, cb-03, cb-04, cb-05, cb-06, cb-10
Block Group 2, Census Tract 9403	None[a]	i-06, cb-03
Block Group 1, Census Tract 9800	None[a]	None[a]
Riverside County, California		
Block Group 1, Census Tract 459	None[a]	x-12, x-13, x-15, x-16, ca-01, ca-02, ca-05, ca-06
Block Group 2, Census Tract 459	p-15w, p-16	x-13
Block Group 2, Census Tract 462	None[a]	None[a]
Block Group 1, Census Tract 469	p-17, p-18	x-15, x-16, x-19, ca-07, ca-09
Block Group 1, Census Tract 470	p-15w	x-09, x-10, x-11, cb-10, ca-01, ca-04, ca-05
Block Groups 2, Census Tract 470	None[a]	None[a]

[a] "None" refers to block groups that are crossed by the EJ study area's 1-mile corridor, but not by the Proposed Action or Alternative Segments.

3.16.3.2 Minority Populations

Population and minority data are presented in Table 3.16-2 for the two states, three counties, relevant cities and CDPs, CCD areas, the EJ comparison area, and the individual block groups. The data in this table will be used for comparison purposes to determine whether the individual block groups have potential EJ populations.

Environmental Justice Comparison Area

The percentage of minorities in the overall EJ comparison area (sum of the three counties) is 49.3 percent, which is slightly higher than Arizona (43.1 percent) and lower than California (60.8 percent). It is also lower than two of the four CCD areas and higher than five of the eight cities and places (CDPs). See Table 3.16-2.

Table 3.16-2 Total Population and Minority Population in the Environmental Justice Study Area

GEOGRAPHY	TOTAL POPULATION[A]	WHITE (NON-HISPANIC)	MINORITY POPULATION					
			BLACK OR AFRICAN AMERICAN (NON-HISPANIC)	AMERICAN INDIAN AND ALASKA NATIVE (NON-HISPANIC)	ASIAN (NON-HISPANIC)	OTHER RACE CATEGORY (NON-HISPANIC)[B]	HISPANIC OR LATINO	% MINORITY
Environmental Justice Comparison Area								
EJ Comparison Area (sum of the three counties)	6,234,629	3,162,273	326,451	73,736	277,135	153,870	2,241,164	49.3%
States								
Arizona	6,561,516	3,734,853	257,620	262,626	186,451	142,940	1,977,026	43.1%
California	38,066,920	14,905,601	2,155,929	145,736	5,062,736	1,262,469	14,534,449	60.8%
Counties								
Maricopa County, Arizona	3,947,382	2,281,134	192,604	60,987	142,261	89,296	1,181,100	42.2%
La Paz County, Arizona	20,348	12,396	49	2,513	140	213	5,037	39.1 %
Riverside County, California	2,266,899	868,743	133,798	10,236	134,734	64,361	1,055,027	58.8%
Cities and Designated Places								
Parker CCD, La Paz County, Arizona	20,348	12,396	49	2,513	140	213	5,037	39.1%
Buckeye CCD, Maricopa County, Arizona	64,761	34,542	3,427	1,237	979	1,112	23,464	46.7%
Blythe CCD, Riverside County, California	15,779	4,976	1,367	0	283	79	9,074	68.5%

GEOGRAPHY	TOTAL POPULATION[A]	WHITE (NON-HISPANIC)	MINORITY POPULATION					
			BLACK OR AFRICAN AMERICAN (NON-HISPANIC)	AMERICAN INDIAN AND ALASKA NATIVE (NON-HISPANIC)	ASIAN (NON-HISPANIC)	OTHER RACE CATEGORY (NON-HISPANIC)[B]	HISPANIC OR LATINO	% MINORITY
Chuckwalla Valley CCD, Riverside County, California	9,056	2,109	1,764	157	165	354	4,507	76.7%
Brenda CDP, Arizona	416	402	0	0	0	0	14	3.4%
Ehrenberg CDP, Arizona	1,017	824	0	0	13	0	180	19.0%
La Paz Valley CDP, Arizona	644	601	0	16	0	0	27	6.7%
Quartzsite town, Arizona CDP	3,646	3,496	0	3	0	0	147	4.1%
Vicksburg CDP, Arizona	1,025	644	0	0	0	15	366	37.2%
Blythe City, California CDP	20,101	5,657	2,741	123	424	320	10,836	71.9%
Mesa Verde CDP, California	1,004	285	85	5	0	17	612	71.6%
Ripley CDP, California	659	33	6	0	0	0	620	95.0%
Block Group Data La Paz County, Arizona								
Block Group 3, Census Tract 201	1,266	923	0	0	0	0	343	27.1%
Block Group 1, Census Tract 205.01	1,218	831	0	0	0	15	372	31.8%
Block Group 2, Census Tract 205.01	703	621	0	0	10	0	72	11.7%
Block Group 1, Census Tract 205.02	1,360	1,230	0	0	0	0	130	9.6%
Block Group 2, Census Tract 205.02	1,257	1,214	0	16	0	0	27	3.4%

GEOGRAPHY	TOTAL POPULATION[A]	WHITE (NON-HISPANIC)	MINORITY POPULATION					
			BLACK OR AFRICAN AMERICAN (NON-HISPANIC)	AMERICAN INDIAN AND ALASKA NATIVE (NON-HISPANIC)	ASIAN (NON-HISPANIC)	OTHER RACE CATEGORY (NON-HISPANIC)[B]	HISPANIC OR LATINO	% MINORITY
Block Group 3, Census Tract 205.02	1,673	1,653	0	3	0	0	17	1.2%
Block Group 1, Census Tract 206.02	633	440	0	0	13	0	180	30.5%
Block Group 2, Census Tract 206.02	703	647	0	0	10	0	46	8.0%
Block Group 2, Census Tract 9403	861	17	0	228	65	14	537	98.0%
Block Group 1, Census Tract 9800	0	0	0	0	0	0	0	N/A
Block Group Data, Maricopa County, Arizona								
Block Group 1, Census Tract 506.03	868	648	0	13	0	7	200	25.3%
Block Group 2, Census Tract 506.03	2,382	1,541	11	25	0	0	805	35.3%
Block Group 3, Census Tract 506.03	617	231	0	12	0	0	374	62.6%
Block Group Data, Riverside County, California								
Block Group 1, Census Tract 459	884	383	18	0	0	0	483	56.7%
Block Group 2, Census Tract 459	693	45	6	0	0	0	642	93.5%
Block Group 2, Census Tract 462	2,197	193	443	0	0	9	1,552	91.2%
Block Group 1, Census Tract 469	2,684	899	384	14	41	97	1,249	66.5%

GEOGRAPHY	TOTAL POPULATION[A]	WHITE (NON-HISPANIC)	MINORITY POPULATION					
			BLACK OR AFRICAN AMERICAN (NON-HISPANIC)	AMERICAN INDIAN AND ALASKA NATIVE (NON-HISPANIC)	ASIAN (NON-HISPANIC)	OTHER RACE CATEGORY (NON-HISPANIC)[B]	HISPANIC OR LATINO	% MINORITY
Block Group 1, Census Tract 470	823	422	103	0	0	0	298	48.7%
Block Group 2, Census Tract 470	888	615	0	0	41	16	216	30.7%

Source: US Census Bureau ACS 5-year Estimates, 2010–2014: Table B03002.

Notes: CCD = census county division, CDP = census designated place, EJ = environmental justice

[a] Total population figures will differ for minority and low-income population tables because some individuals are not counted within the income population.

[b] The "Other Race Category" includes non-Hispanic residents identified as Native Hawaiian and other Pacific Islander, some other race, or two or more races.

State, County, Census County Division, and Census Designated Places

As shown in Table 3.16-2, the states of Arizona and California have overall minority populations of 43.1 and 60.8 percent, respectively. Riverside County has a minority population (61.7 percent) that is slightly (1.5 percent) greater than the state percentage, while La Paz and Maricopa Counties have minority populations (39.1 and 42.2 percent, respectively) slightly lower than that of Arizona as a whole.

The CCDs and CDPs are also listed in the table. These include the city of Blythe (CDP) and the CCD area of Blythe, which both have percentages of minorities around 70 percent. Ripley CDP, which is south of Blythe, has a very high percentage of minorities (95 percent).

Block Groups

As shown in Figure 3.15-1 (Appendix 1) and listed in Table 3.16-2, the following block groups have EJ minority populations with percentages at least 10 percent greater than the EJ comparison area percentage of 49.3:

- Maricopa County, Arizona
  - Block Group 3 in Census Tract 506.03 (62.6 percent minority population)
- La Paz County, Arizona
  - Block Group 2, Census Tract 9403 (98.0 percent minority population)
- Riverside County, California
  - Block Group 1, Census Tract 459 (56.7 percent minority population)

- Block Group 2, Census Tract 459 (93.5 percent minority population)
- Block Group 2, Census Tract 462 (91.2 percent minority population)
- Block Group 1, Census Tract 469 (66.5 percent minority population)

The block groups with relatively high minority populations are shaded in red on Figure 3.16-1 (Appendix 1). Maricopa County has one block group (Block Group 3 in Census Tract 506.03) with a percentage of minorities (62.6 percent) higher than the EJ comparison area, county, and state percentages. Hispanic or Latino populations represent over 60 percent of the population in this block group, while about two percent are American Indian or Alaska Native. The other block groups in Maricopa County have relatively lower minority populations, ranging between 25 and 36 percent. The percentages of minorities in these block groups are lower than the EJ comparison area, county, or state population percentages.

In La Paz County, one of the block groups (Block Group 2 in Census Tract 9403) has a percentage of minorities (98 percent) higher than the overall EJ comparison area, while the remaining block groups have lower percentages ranging between 1 and 32 percent, which are lower than the EJ comparison area as well as the county and state totals. This high minority block group is on the western end of La Paz County, near the California border. Of the 861 people in the high-minority block group, 62.4 percent are Hispanic or Latino, 26.5 percent are American Indian and Alaska Native, and 7.5 percent are Asian. This block group includes the CRIT lands. The primary population center in La Paz County is Quartzsite, which has a much lower minority population of 4.1 percent (Table 3.16-2, Quartzsite CDP).

Four of the six block groups in Riverside County have higher percentages of minorities than the EJ comparison area. Three of these block groups in and around the city of Blythe have higher percentages of minorities than both Riverside County and California. The percentage of minorities ranges from 56.7 to 93.5 percent. Two of the block groups (Block Groups 1 and 2 in Census Tract 470) had a percentage lower (48.7 and 30.7 percent, respectively) than the EJ comparison area. All of the block groups with percentages of minorities higher than the EJ comparison area have Black or African American populations and Hispanic or Latino populations. One of the higher-minority block groups has a population of American Indian or Alaska Native residents (14 people). This same block group also has a population of Asian residents (41 people) and a population of minorities in the "Other Race" category (97 people). The Blythe CDP has a minority population of 71.9 percent, with 54.9 percent of the population identifying as Hispanic or Latino and an additional 13.6 percent as Black or African American.

Colorado River Indian Tribes

The EJ study area crosses CRIT lands, although the majority of the CRIT lands are outside of the study area to the north. Block Group 2, Census Tract 9403, with a minority percentage of 98.0 percent, includes CRIT lands. However, there are no residential or commercial areas that have been identified on CRIT lands within the 1-mile Project corridor based on a review of aerial photos.

Census Tract 206.02 (including Block Groups 1 and 2) does not show a population of minorities greater than the total percentage of minorities within the total EJ comparison area. The Proposed Action and Alternative segments that are under CRIT jurisdiction include part of Proposed Action Segment p-11 and alternative Segment cb-03.

3.16.3.3 Low Income Population

Population and poverty data are presented in Table 3.16-3 for two states, three counties, relevant cities and CDPs, CCDs, the EJ comparison area, and the individual block groups. The data in this table will be used for comparison purposes to determine whether the individual block groups have potential EJ populations with respect to low-income status.

Environmental Justice Comparison Area

The percentage of population living below the poverty level, as calculated by the US Census Bureau, is shown in Table 3.16-3. The EJ comparison area has an average of 17 percent of the population recorded as low-income individuals.

Table 3.16-3 Total Population and Percentage Living Below Poverty Level

GEOGRAPHY	TOTAL POPULATION (FOR POVERTY ESTIMATES)[A]	POPULATION BELOW POVERTY LEVEL (%)
Environmental Justice Comparison Area		
EJ Comparison Area (sum of the three counties)	6,148,443	17.0%
States		
Arizona	6,411,354	18.2%
California	37,323,127	16.4%
Counties		
La Paz County, Arizona	20,108	18.4%
Maricopa County, Arizona	3,895,963	17.1%
Riverside County, California	2,232,372	16.9%
Cities and Designated Places		
Parker CCD, La Paz County, Arizona	20,108	18.4%
Buckeye CCD, Maricopa County, Arizona	64,291	17.0%
Blythe CCD, Riverside County, California	15,510	24.3%
Chuckwalla Valley CCD, Riverside County, California	2,000	19.2%
Brenda CDP, Arizona	416	14.2%
Ehrenberg CDP, Arizona	1,017	18.4%
La Paz Valley CDP, Arizona	644	11.5%
Quartzsite town CDP, Arizona	3,643	9.6%
Vicksburg CDP, Arizona	1,025	14.6%
City of Blythe CDP, California	13,653	23.2%
Mesa Verde CDP, California	1,004	24.6%
Ripley CDP, California	659	33.7%

GEOGRAPHY	TOTAL POPULATION (FOR POVERTY ESTIMATES)[A]	POPULATION BELOW POVERTY LEVEL (%)
Maricopa County, Arizona		
Block Group 1, Census Tract 506.03	868	14.6%
Block Group 2, Census Tract 506.03	2,382	13.3%
Block Group 3, Census Tract 506.03	617	32.9%
La Paz County, Arizona		
Block Group 3, Census Tract 201	1,266	21.1%
Block Group 1, Census Tract 205.01	1,218	15.6%
Block Group 2, Census Tract 205.01	703	15.4%
Block Group 1, Census Tract 205.02	1,360	7.1%
Block Group 2, Census Tract 205.02	1,257	5.9%
Block Group 3, Census Tract 205.02	1,670	15.1%
Block Group 1, Census Tract 206.02	633	15.6%
Block Group 2, Census Tract 206.02	703	18.1%
Block Group 2, Census Tract 9403	861	16.5%
Block Group 1, Census Tract 9800	0	Not applicable
Riverside, California		
Block Group 1, Census Tract 459	884	13.9%
Block Group 2, Census Tract 459	693	33.3%
Block Group 2, Census Tract 462	2,152	39.6%
Block Group 1, Census Tract 469	1,852	20.1%
Block Group 1, Census Tract 470	823	12.0%
Block Group 2, Census Tract 470	888	28.9%

Source: US Census Bureau American Community Survey 5-year Estimates, 2010–2014: Table C17002

Notes: CCD = census county division, CDP = census designated place, EJ = environmental justice

[A] Total population figures will differ for minority and low-income population tables because some individuals are not counted within the income population data.

State, County, Census County Division, and Census Designated Places

For Arizona and California, the percentages of their respective populations living below the poverty level are 18.4 and 16.4 percent, which are close to the study's comparison area value. CCDs and CDPs listed in the table include the City of Blythe (CDP) and the CCD area of Blythe, which both have a low-income population of about 24 percent. Ripley CDP, which is south of Blythe, has the highest low-income population percentage at 33.7 percent, while Mesa Verde CDP has the second highest (24.6 percent) out of the CDPs and CCDs evaluated. These local areas along the Proposed Action and Alternative segments have low-income percentages that are substantially greater than the EJ comparison area.

Low-income Data from Block Groups

As shown in Figure 3.16-2 (Appendix 1) and listed in Table 3.16-3, the following block groups have percentages of low-income populations greater than the EJ comparison area percentage of 17:

Maricopa County, Arizona

- Block Group 3, Census Tract 506.03 (32.9 percent low-income population)

La Paz County, Arizona

- Block Group 3, Census Tract 201 (21.1 percent low-income population)
- Block Group 2, Census Tract 206.02 (18.1 percent low-income population, which is less than 10 percent greater than for the EJ comparison area)

Riverside County, California

- Block Group 2, Census Tract 459 (33.3 percent low-income population)
- Block Group 2, Census Tract 462 (39.6 percent low-income population)
- Block Group 1, Census Tract 469 (20.1 percent low-income population)
- Block Group 2, Census Tract 470 (28.9 percent low-income population)

In Maricopa County, one block group (Block Group 3, Census Tract 506.03) has a greater percentage of low-income population (32.9 percent) than the EJ comparison area. This block group does not include any incorporated areas or CDPs. All of the other block groups in this county within the EJ study area have low-income population percentages below that of the EJ comparison area, Maricopa County, and the state of Arizona.

In La Paz County, two block groups (Block Group 3 in Census Tract 201 and Block Group 2 in Census Tract 206.02) have higher percentages (21.1 and 18.1 percent, respectively) of the population living below the poverty level as compared with the EJ comparison area. The first block group includes much of Salome, a small portion of Vicksburg, and approximately half of Sunwest. The second block group runs along the Arizona side of the Colorado River, south of I-10, and includes the majority of the Ehrenberg CDP and all of Cibola CDP. All of the other block groups in La Paz County within the EJ study area have low-income population levels below the EJ comparison area percentage of 17 percent, the La Paz County percentage of 18.4 percent, and the Arizona percentage of 18.2 percent.

The Town of Quartzsite is located in Census Tract 205.02; Block Group 3 of this tract has the highest poverty rate within this tract, at 15.1 percent. This area includes the northeastern area of Quartzsite and extends north to the southeastern-most corner of Parker. The overall poverty rate for the Town of Quartzsite, however, is 9.6 percent. This indicates that the poverty rate within the town limits is overall lower than surrounding areas within the census block groups and the EJ comparison area. However, the poverty rates for both block groups that cover Quartzsite are still below the overall EJ comparison area's low-income population percentage, which is 17 percent.

Four of the six block groups in Riverside County have higher percentages of the populations living below the poverty level as compared with the EJ comparison area. These percentages range from 20.1 to 39.6 percent. These same four block groups also have low-income population percentages that are greater than the Riverside County and California averages of 16.9 and 16.4 percent, respectively. This area includes the City of Blythe, which has a total low-income population of 23.2 percent.

3.16.3.4 Environmental Justice Communities

Over the entire Proposed Action and Alternative segments, potential EJ populations for both minority and low-income data were identified at the block group level. Regionally, potential EJ populations were identified in Arizona between Delaney Substation and Quartzsite and east of the Colorado River, while in California, potential EJ populations were identified in five of the six block groups in the EJ study area in Blythe. These are shown in Figure 3.16-2 (Appendix 1). Table 3.16-4 identifies those block groups that are potential EJ populations for low-income and/or minorities, highlighted in gray.

Table 3.16-4 Block Groups with Populations Greater than the Environmental Justice Comparison Area Minority and Low-income Population Percentages

BLOCK GROUP	PROPOSED SEGMENT IN BLOCK GROUP	ALTERNATIVE SEGMENT IN BLOCK GROUP	MINORITY POPULATION (%)	POPULATION BELOW POVERTY LEVEL (%)
Maricopa County, Arizona				
Block Group 3, Census Tract 506.03	None	None	62.6	32.9
La Paz County, Arizona				
Block Group 3, Census Tract 201	p-01 to p-06	d-01, x-01 to x-04, i-01 to i-05	27.1	21.1
Block Group 2, Census Tract 206.02	p-10 to p-15c	x-08, i-06, i-07, i-08s, cb-01 to cb-6, cb-10	8.0	18.1
Block Group 2, Census Tract 9403	None	i-06, cb-03	98.0	16.5
Riverside County, California				
Block Group 1, Census Tract 459	None	x-12, x-13, x-15, x-16, ca-01, ca-02, ca-05	56.7	13.9
Block Group 2, Census Tract 459	p-15w, p-16	x-13	93.5	33.3
Block Group 2, Census Tract 462	None	ca-05	91.2	39.6
Block Group 1, Census Tract 469	p-17, p-18	x-15, x-16, x-19, ca-07, ca-09	66.5	20.1
Block Group 2, Census Tract 470	None	None	30.7	28.9

Source: 2014 American Community Survey, 5-year Estimates, Tables B03002 and C17002.

Note: Shading indicates the population meets the criteria of an EJ population. Block groups with EJ populations are identified as those with minority populations greater than 49.3 percent or low-income populations greater than 17 percent.

Block Groups with Higher Percentages of Minority and Low-Income Populations than the Environmental Justice Comparison Area (EJ Populations)

In Maricopa County, Arizona, one block group out of three was identified with a minority population percentage greater than the overall minority population percentage in the EJ comparison area, as shown on Figure 3.16-3 and Figure 3.16-4 (Appendix 1). Based on aerial imagery, it does not appear that there are any residential, commercial, or industrial uses within a 1-mile corridor along the Proposed Action and Alternative segments.

In La Paz County, Arizona, three block groups out of ten were identified with minority or low-income population percentages greater than the EJ comparison area percentages; two had higher percentages of low-income population percentage and one had a higher percentage of racial or ethnic minority population. A review of aerial photographs showed that, within a 1-mile corridor along the Proposed Action and Alternative segments in Block Group 3, Census Tract 201, this area is a largely undeveloped natural area with very few residential, commercial, or industrial uses (Appendix 1, Figure 3.16-4). Block Group 2, Census Tract 206.02, and Block Group 2, Census Tract 9403, both run along the eastern shore of the Colorado River, with the first mostly south of I-10 and the second mostly north of I-10 on CRIT lands. CRIT lands are discussed below. A review of aerial imagery shows some development within the EJ study area for the area of Block Group 2, Census Tract 206.02. This includes open space, agricultural lands, RV parks, and commercial areas.

The BLM LTVAs and private RV parks in and around Quartzsite have seasonal (that is, temporary) and long-term residents that would not be represented by US Census Bureau data. Although the characteristics of this population are not documented in the US Census data, it is possible there could be minority and low-income representation exceeding the comparable populations within the EJ comparison area.

In Riverside County, California, five of the six block groups have minority and/or low-income populations greater than the EJ comparison area percentages. Four of the block groups have minority population percentages substantially greater than the EJ comparison area's minority population percentage, and four of the block groups have a low-income population percentage substantially greater than the comparison area's low-income population. As shown in Figure 3.16-5 (Appendix 1), there are commercial and recreational uses, including those along the Colorado River's banks, as well as residences and agricultural uses.

For the Town of Quartzsite, Arizona CDP, the census data show 4.1 percent minority representation and a low-income population of 9.6 percent. Data for the city of Blythe CDP and the CCD area of Blythe reveal that both have a low-income population of about 24 percent. Ripley CDP, which is south of Blythe, has the highest low-income population percentage, at 33.7 percent, while Mesa Verde CDP has the second highest (24.6 percent) of the CDPs and CCDs evaluated. These local areas have low-income percentages that are substantially greater than those of the EJ comparison area.

Colorado River Indian Tribes

A portion of Proposed Action Segment p-11 is adjacent to CRIT reservation lands, and Alternative Segments i-06 and cb-03 would cross CRIT reservation lands. The block group data covering this area show a 98 percent minority population, with 26.5 percent Native Americans. The lands crossed by Segment p-11 and Alternative Segments i-06 and cb-03 are all undeveloped, based on a review of aerial photos and field reconnaissance, and do not include residences. The reservation is shown on Figures 1.1-1 and 2.2-1 (Appendix 1); Figures 3.16-2 through 3.16-4 (Appendix 1) show details of the area of the reservation crossed by the Proposed Action and the Alternative segments.

As a Federally recognized Indian tribe, the CRIT are considered an EJ Population under BLM policy and guidance, as well as CEQ and EPA guidelines (CEQ 1997; EPA 2014a). Should the CRIT be adversely and disproportionately impacted by the Proposed Action, ongoing consultation, as documented in Section 5.3.2, would be used to address tribal concerns. Scoping consultation with the CRIT resulted in a request for further, detailed consultation regarding its lands and adjacent areas (Section 3.7, Concerns of Indian Tribes). Consultation and coordination with several of the tribes suggests that the Project Area is both a traditional cultural landscape and there may be TCPs present.

3.17 TRAFFIC AND TRANSPORTATION

3.17.1 Applicable Laws, Regulations, Policies, and Plans

3.17.1.1 Federal

BLM Policies and Plans

On Federal lands managed by the BLM, motorized routes are designated for public use through the individual field office's RMP or TMP. The Project Area lies within the planning areas for five BLM field offices; their relevant RMPs and TMPs are discussed below. Although the BLM manages its own transportation system, the agency often partners with the Federal Highway Administration (FHA) and with state and county transportation agencies to provide access to BLM-administered land. Many BLM roads are unmaintained informal facilities with light use; therefore, applying standard transportation management and regulatory practices can be difficult. Certain motorized routes, as identified in the RMPs and TMPs, may be designated by the BLM for other authorized uses, such as OHV use.

BLM Manual 1626 – Travel and Transportation Management (Public)
This manual section provides policy guidance for incorporating travel and transportation management decisions into the BLM's land use planning process and implementation actions. It describes an interdisciplinary approach to travel and transportation management that addresses resources, resource uses, and associated access (e.g., designated and primitive roads and trails) to public lands and waters, including motorized, non-motorized, and non-mechanized modes of travel.

BLM Manual 9100 – Facilities Planning, Design, Construction and Maintenance (Public)
This is the BLM's manual of responsibilities, policies, and procedures for facility planning, design, construction, and maintenance support used to manage public lands; it provides the current standards and codes for facilities constructed on BLM-administered land (BLM 2008e). Projects for new road construction and road improvements on BLM-administered land use this manual for guidance regarding minimum standards of width, alignment, grade, surface, and other requirements.

BLM Manual 9101 addresses planning for facilities; BLM Manual 9102 discusses design requirements for the facilities; BLM Manual 9103 addresses the construction of facilities, including maintenance, housekeeping, and condition assessments; and BLM Manual 9104 discusses maintenance requirements for facilities on BLM-administered land.

BLM Bradshaw-Harquahala RMP
A portion of the Project in the East Plains and Kofa Zone geographic area lies within the Hassayampa Field Office planning area, for which the BLM has developed the Bradshaw-Harquahala RMP (BLM 2010c). The RMP limits motorized travel to designated routes only and limits travel to inventoried routes pending the completion of route designations and TMPs. The TMPs for this planning area have not yet been developed and approved.

Although the TMPs have not yet been completed, the RMP states, "All public lands, with the exception of Congressionally designated WAs, are allocated as limited use areas, with motorized and mechanized vehicle uses limited to designated routes. Until routes are formally designated, motorized vehicle access is limited to vehicle routes on the current BLM route inventory…" The areas limited to designated routes within the Bradshaw-Harquahala planning area include 799,280 acres. In addition, the Hassayampa River Canyon, Hells Canyon, Harquahala Mountains, Big Horn Mountains, and Hummingbird Springs Wildernesses remain closed to motorized and mechanized travel. The areas closed to motorized and mechanized travel include 96,820 acres within the Bradshaw-Harquahala planning area.

BLM Lower Sonoran RMP
Another portion of the Project Area in the East Plains and Kofa Zone geographic area lies within the Lower Sonoran Field Office's planning area, for which the Lower Sonoran RMP has been developed (BLM 2012a). Under this RMP, all public land is classified as open, closed, or limited, per 43 CFR 8342.1; however, no areas within the Lower Sonoran planning area are allocated for open motorized vehicle use. Approximately 91,100 acres of the planning area are designated as closed to motorized use, which mainly includes WAs. In addition, approximately 839,060 acres are designated as limited use, where motorized vehicles may use only existing roads and trails as designated by the current BLM route inventories. The route inventories will be finalized through development of the TMPs; however, TMPs have not yet been completed. Once the TMPs are complete and approved, travel will be restricted to designated roads, primitive roads, and trails. Non-motorized vehicles will be limited to designated roads, primitive roads, and trails.

BLM Lake Havasu RMP
As small portion of the Project Area in the East Plains and Kofa Zone geographic area lies within the Lake Havasu Field Office planning area, for which the Lake Havasu RMP has been developed (BLM 2007). Within this planning area, motorized travel is limited to existing roads and trails unless a specific classification that allows travel has been applied to an area. Existing roads and trails for motorized use are defined as those routes and trails found on route inventories completed between 1990 and 2004. The Lake Havasu planning area is divided into six travel management areas. Of the six travel management areas, a TMP has been completed for one area: the Bullhead TMP. The Project Area lies within the Bouse travel management area, for which a TMP has not yet been developed.

BLM YFO RMP

A majority of the Project Area within the East Plains and Kofa Zone, Quartzsite Zone, and Copper Bottom Zone geographic areas lies within the YFO planning area, for which the YFO RMP has been developed (BLM 2010b). Under this RMP, all BLM-administered land is designated as open, closed, or limited OHV management areas per 43 CFR 8342.1. Within this planning area, the open OHV lands include the 400-acre Ehrenberg Sandbowl Open OHV Management Area. In the closed OHV management areas, no OHV use is allowed; 172,940 acres of the YFO planning area are currently designated as closed. The YFO also reserves the right to designate additional closed areas when they are necessary to protect people, property, and public lands and resources in areas where OHV use has been determined to be causing irreparable harm to the existing resources. Certain areas within the planning area are classified as limited OHV access, including ACECs, where OHV use is managed in a manner that does not damage important cultural resources and wildlife habitat. Within the planning area, 1,144,660 acres of BLM-administered land are classified as limited OHV use.

The YFO planning area is divided into five travel management areas, and vehicle use will be managed through an individual TMP for each area. Two of the five TMPs are currently in progress: the La Posa TMP and the Imperial Hills TMP. The Project Area lies within both of these travel management areas. The La Posa TMP has been completed and approved, including identification of the transportation system for this travel management area. The Imperial Hills TMP is in progress.

The La Posa TMP establishes a comprehensive travel network and meets current and future access needs to the travel management area’s public lands (BLM 2016k). It also develops proposed actions to protect resources and to reduce conflicts between users of the travel network and public lands. This document identifies a proposed system of roads, primitive roads, and trails and the terms for their use and maintenance. It outlines facilities to be developed in support of recreation, access, protection of resources, the creation of new routes, and closure of other routes. The travel network covers both motorized and non-motorized trails. Standard Arizona BLM OHV regulations and travel management policies are listed and discussed in this plan.

BLM California Desert Conservation Area Plan

The portion of the Project Area in California lies within the Palm Springs-South Coast Field Office planning area, for which the CDCA Plan was developed and amended (BLM 1980). Under the CDCA, motorized vehicle use is generally not allowed unless provided for in legislation for particular areas or in management plans. The CDCA notes that motorized vehicle use is allowed on existing routes of travel, unless the existing routes are classified as closed or limited use. Although the CDCA did not identify routes or complete a route inventory, the CDCA Plan was amended by the NECO Plan, which included a route inventory process (BLM 2002b).

Under the CDCA Plan, three travel and transportation management plans have been developed and approved: the Northern and Eastern Mojave Desert Routes of Travel Designation Project, the Western Colorado Desert Routes of Travel Designations, and the West Mojave TMP. However, none of these plans are applicable to the Project Area.

Federal Highway Administration Regulations

This agency's regulations state that it will allow, under controlled circumstances, the placement of longitudinal utility facilities within the access control limits of the Interstate system or other fully access-controlled freeways. Longitudinal means that the utility would run lengthwise along the freeway rather than across the freeway. These regulations do not apply to utility lines serving facilities required for the operation of the freeway. The FHA's guidance on longitudinal accommodation of utility facilities within the highway ROW of the Interstate System is found in 23 CFR 645, Sub-part B. This regulation requires each state to develop its own utility accommodation policy, setting forth the manner in which the state will control the use of Federal-aid highway ROW by utility facilities.

EO 11644 (February 8, 1972) and EO 11989 (May 24, 1977): Use of Off-Road Vehicles on the Public Lands

The purpose of these EOs is to establish policies and provide for procedures that will ensure that the use of OHVs on public lands will be controlled and directed so as to protect the resources of those lands, to promote the safety of all users of those lands, and to minimize conflicts among the various uses of those lands.

Federal Aviation Administration (FAA) Regulations

The FAA's mission is to provide the safest, most efficient aerospace system in the world. To accomplish this, the FAA developed an obstruction evaluation and airport airspace analysis tool to be used for all public and private development that is planned within the vicinity of an airport and has the potential to affect aviation activities. A proposal must be submitted to the FAA for an obstruction evaluation and airport airspace analysis for projects that fall within the thresholds. The FAA also issues standards for marking and lighting vertical-built components such as transmission line structures.

3.17.1.2 State

Arizona

Arizona Department of Transportation, Metropolitan Planning Organization, and Council of Governments Guidelines and Procedural Manual

This manual describes the metropolitan transportation planning processes and administrative requirements that the ADOT, transportation management areas, metropolitan planning organizations, and councils of government must implement when working on transportation planning projects. This manual provides guidance related to the planning processes and administrative requirements when facilitating transportation planning activities by clarifying roles and responsibilities, improving efficiency among organizations, and reducing questions and potential conflicts. This document also outlines the guidelines and procedures for conducting regional transportation planning functions and programs administered by the ADOT Multimodal Planning Division.

Arizona Off-highway Vehicle Law (Arizona Revised Statutes 28-1171.4, 2005)

This Arizona state law pertains to OHVs, especially the section on OHV operation restrictions, violations, and classifications. The law documents the list of equipment required to operate OHVs, riding laws, and specific guidance on out-of-state residents' use of OHV facilities. A permit is required to operate vehicles in designated areas.

In particular, the law states that OHVs shall not be used off of an existing road, trail, or route in a manner that causes damage to wildlife habitat, riparian areas, cultural or natural resources, or property or improvements. OHVs may not be operated on roads, trails, routes, or areas closed as indicated in rules or regulations of a Federal agency, the state, a county, or a municipality or by proper posting if the land is private land.

ADOT Highway Right-of-Way Regulations
Some of the Proposed Action and Alternative Segments would encroach on highways and highway ROWs that are under ADOT's jurisdiction, including I-10, US 60, US 95, Arizona SR 95, and Business Route 10. Utilities may not run parallel to Interstate highways within ADOT ROWs, but they may cross Interstate ROWs. Utilities may run parallel to state highways within ADOT ROWs. An encroachment permit must be obtained prior to installing aerial or subsurface utilities running over, under, or parallel to ADOT ROWs. Additional regulations that describe permit requirements and policies are described below.

ADOT Highway Encroachment/Right-of-Way Permits

AAC Title 17, Article 5, describes the conditions under which utilities can be co-located within public ROWs. An encroachment permit, pursuant to ARS 28-363 and Administrative Rule R17-3-502, is a written approval granted by ADOT for construction of fixed or temporary improvements within a state highway ROW or for any activity requiring the temporary use of a state highway ROW. For more information, consult ADOT's Encroachment Permits, Policies, Guidelines, and Procedures Manual (2008).

ADOT Highway Policies for Utilities Crossing Highways

ADOT's Policy for Accommodating Utilities on Highway Rights of Way (2009) identifies the policies for utilities crossing highways. Permission to perform work in an ADOT ROW requires submitting a Highway Encroachment Permit Application. A permit must be issued prior to installation of utilities. Specific information on closing Interstate and state highways, as well as permission for closing, may be obtained from ADOT's Yuma District Office during the pre-permitting phase of a project.

California

California Vehicle Code
This code contains almost all statutes relating to the operation, ownership, and registration of vehicles (including bicycles) in the state of California. Within this code, Division 16.5 (Off-Highway Vehicles) contains statutes specific to OHV use and operation.

Caltrans Highway Encroachment/Right-of-Way Permits
Caltrans policy (Caltrans Encroachment Permit Manual, Chapter 600-Utilities Permits; Caltrans 2018) allows utilities within conventional highway ROW subject to reasonable conditions and excludes them from within access-controlled ROW to the extent practicable with few exceptions. Requests for utility encroachments that are not allowed by Caltrans policy or utility access within access-controlled ROW require an approved encroachment policy exception. All utility

encroachments within the state highway ROW must be designed, installed, and maintained so that traffic disruption and other hazards to highway users are minimized. The design must comply with Caltrans standards and specifically Topic 309 of the Highway Design Manual.

Airport Land Use Law, Public Utilities Code Sections 21670–21679.5
These sections contain legal codes enacted by the California State Legislature for airport land use–related businesses. Section 21674.7 states, "It is the intent of the Legislature to discourage incompatible land uses near existing airports. Therefore, prior to granting permits for the renovation or remodeling of an existing building, structure, or facility, and before the construction of a new building, it is the intent of the Legislature that local agencies shall be guided by the height, use, noise, safety, and density criteria that are compatible with airport operations, as established by this article, and referred to as the Airport Land Use Planning Handbook, published by the division, and any applicable Federal aviation regulations."

3.17.1.3 Local

Table 3.17-1 summarizes applicable local planning documents governing land uses and transportation near the Project Area.

Table 3.17-1 Summary of Local Land Use Planning Documents Reviewed and Relevant Transportation Policies

DOCUMENT	REVIEW FINDINGS
MAG Regional Transportation Plan (MAG 2003, updated in 2014)	The MAG Regional Transportation Plan (RTP) is the principal governance document for transportation investments in the greater Phoenix metropolitan region. The implementation arm of the RTP is the Transportation Improvement Program, which specifies a program of projects for transportation, including expansions of roadway facilities, maintenance, investments in public transportation facilities and systems, bicycling, and trail systems. A review of the RTP and Transportation Improvement Program did not show substantive investments in transportation facilities where the proposed transmission line is located in the MAG planning region beyond routine roadway maintenance. As the greater Phoenix region continues to grow, the plan emphasizes changes in land use form to promote density within the urban core and managing existing transportation assets.
Maricopa County Comprehensive Plan: Vision 2030 (Maricopa County 2016)	The plan specifically identifies high-voltage transmission lines and structures among unique land uses. A specific land use policy of the plan supports the use of "land use buffers and compatible land use strategies near existing and future high voltage electric utility line corridors." The plan does not show any investments in transportation facilities where the proposed transmission line is located at this time.
Maricopa County Tonopah/ Arlington Area Plan (Maricopa County 2007)	This area plan is intended to guide decisions on growth in the Tonopah/Arlington area of Maricopa County. The most applicable policies of the plan, with respect to the Project and transportation, are Policy T1.1, "Maintain Level of Service (LOS) C or better on all County-owned roadways and intersections," and Policy T1.5, which states, "Encourage the Arizona Department of Transportation to improve interstate access at the appropriate time." There are no recommended changes in functional classification or expansion of roadways, including I-10, at this time.

DOCUMENT	REVIEW FINDINGS
La Paz County Comprehensive Plan (La Paz County 2010a, first adopted in 2005)	The plan emphasizes growth in and around existing urbanized locations, limiting expansion of the built environment and roads into open space. The plan supports working with the BLM to maintain open space and minimize visual impacts on desert vistas and mountain views. The plan also supports the creation of an aviation plan and a strategy to protect airspace in the county for future facility development.
La Paz County Transportation Planning Study (La Paz County 2010b)	This plan outlines specific investments for transportation facilities in La Paz County and its municipalities. A key element of the plan is the identification of capacity deficiencies and expansion needs. While several portions of the plan identify the need for repaving and drainage improvements, the plan identifies stretches of roadways where additional traffic lanes and/or passing lanes should be added based on future traffic growth projections. Near Quartzsite, the plan supports the addition of two general-purpose traffic lanes along US 95 within the town limits, given traffic volume increases and truck volume increases projected in a planning horizon year of 2030, mostly associated with traffic coming from I-10. Where the proposed transmission route is located along US 95, the plan projects traffic increases, but these increases are not anticipated to require additional traffic lanes where the transmission line is proposed for either the Proposed Action or Alternative Segments. Similar to the La Paz County Comprehensive Plan, this plan supports the development of a plan for an airport and industrial park in Quartzsite in anticipation of future industrial commercial growth.
Riverside County General Plan (Riverside County 2003, as amended)	The Riverside County General Plan provides policy guidance for land use and transportation investments throughout Riverside County. Guided in part by area plans for specific regions of the county, this plan includes land use and transportation policies. Much of the land use component is focused on encouraging density in existing urban centers, while transportation focuses on enhancing multimodal facilities and corridors. The plan also focuses on airport facilities. Relevant to the Project Area are the plan's land use and circulation elements. The land use plan supports the continued growth of communities in Riverside County through density and minimizing growth in undeveloped areas. The circulation element supports the expansion of roadways, rail systems, and multimodal transportation options and corridors as growth occurs and expansion is warranted. Circulation Policy 25.2 states "Locate new and relocated utilities underground when possible. All remaining utilities shall be located or screened in a manner that minimizes their visibility by the public." As specified in the plan, Land Use Policy 14.2 provides that all projects must be reviewed and "require consistency with any applicable airport land use compatibility plan as set forth in Appendix L and as summarized in the Area Plan's Airport Influence Area section for the airport in question." The Riverside County Airport Land Use Commission is designated as the responsible public board overseeing projects that could affect the safe operation and expansion of airports in the county. The map of Airport Influence Areas in Chapter 4 of the Plan shows that the designated area for the Blythe Airport extends south of I-10 where Alternative Segments are located.

DOCUMENT	REVIEW FINDINGS
Riverside County General Plan Amendment No. 960 (RiversideCounty 2014a)	An update to the 2003 Riverside County General Plan, the recommendations of this plan are consistent with many of the recommendations for the eastern portion of Riverside County where the Proposed Action is located. As specified in the plan, Circulation Policy 25.1 states, "Promote and encourage efficient provisions of utilities such as water, wastewater, and electricity that support Riverside County's Land Use Element at buildout." Policy 25.1 states, "Locate new and relocated utilities underground when possible and feasible. All remaining utilities shall be located or screened in a manner that minimizes their visibility by the public." The Circulation Element also establishes whether minimum target levels of service have been designated for the review of development proposals in the unincorporated areas of Riverside County. According to Policy 2.1, "LOS C shall apply to all development proposals in any area of the Riverside County not located within the boundaries of an Area Plan, as well those areas located within the following Area Plans: REMAP, Eastern Coachella Valley, Desert Center, and Palo Verde Valley," which includes the transportation study area.
Riverside County Palo Verde Valley Area Plan (RiversideCounty 2014b)	This area plan for the Palo Verde Valley Area of Riverside County incorporates much of the city of Blythe and surrounding land. Included as part of this plan are Policy Areas, which identify specific policy governance for growth and development. A Policy Area is established for the Blythe Airport, which limits the types of land uses, concentrations of populations, and height of proposed structures within a defined development zone.
Town of Quartzsite General Plan (Town of Quartzsite 2014)	The Town of Quartzsite General Plan details the community's vision for growth, sustainability, and economic vitality. The I-10 freeway and US 95 play a prominent role in the plan as key transportation corridors. In general, Quartzsite has generally dispersed land use patterns. Growth is anticipated in the southeastern region of the town, and most transportation investments focus on expansion of existing roadways near the I-10 freeway entrance/exit ramp. The plan establishes the target level of service for the Town of Quartzsite as well as the average daily traffic counts on three major collector streets during different times of the year.
City of Blythe General Plan 2025 (City of Blythe 2007a)	The City of Blythe General Plan outlines a vision for the city's growth to 2025. Key elements of the transportation plan include investment in streets surrounding the I-10 corridor to support freight and commercial goods movement. The plan supports the expansion of streets and roads to satisfy anticipated demand, while avoiding over-design. The plan also supports expansion of the Blythe Airport in the future to handle greater volumes of airplane traffic for goods movement and to promote greater mobility within the county and region. The plan establishes standards of traffic level of service for the city of Blythe. Policy 11 states, "Strive to maintain traffic LOS B on residential streets and LOS C or better on arterial and collector streets, at all intersections, and on principal arterials in the CMP during peak hours." Policy 12 states, "Accept LOS D for built-out areas served by transit after finding that there is no practical and feasible way to mitigate the lower level of service and the uses resulting in the lower level of service are of clear, overall public benefit."

3.17.2 Study Area

The traffic and transportation study area includes a generally 5-mile buffer on either side of the Proposed Action and Alternative Segments to create a 10-mile-wide corridor. A 10-mile-wide corridor allows for the identification of roadways and facilities that could potentially be affected by the Project from the perspective of traffic and roadway operations and provides some flexibility of Project routing and design. The traffic and transportation study area is shown in Figures 3.17-1a-d (Appendix 1).

Traffic data were unavailable for many of the unpaved roads in the transportation study area. These unpaved roads are typically low-volume facilities, for which the Transportation Research Board Committee for Low-Volume Roads identified 400 vehicles per day as the typical upper limit for lightly traveled gravel or dirt roads (Transportation Research Board 2000). Traffic counts are not generally collected on unpaved roads. Data on trails and trail use were obtained from the BLM where available.

3.17.3 Existing Conditions

3.17.3.1 Roadways and Traffic

The roadway network in the study area includes I-10, US 95, US 60, SR 95, SR 78, Business Route 10, roads and streets in Quartzsite and Blythe, Ramsey Mine Road, utility/recreation access roads, and various local roads and dirt trails on BLM-administered land and private property. I-10 extends from Tonopah, Arizona, on the eastern end of the study area through Quartzsite and across the Colorado River through Blythe, California, to the Colorado River Substation at the western end of the study area. US 95 and SR 95 travel north-to-south through the study area, crossing through the Town of Quartzsite. SR 78 travels north-to-south through Blythe. Business Route 10 travels east to west through the transportation study area in Quartzsite parallel to and on the north side of I-10. Much of the study area is characterized by rural and uninhabited areas served by maintained local roads, most of which are lightly traveled one- or two-lane gravel or dirt roads.

Level of Service

Level of service (LOS) is a quantitative measurement of operational characteristics of traffic and the perception of the traffic conditions by both motorists and passengers. Six levels of service are defined in the Transportation Research Board's *Highway Capacity Manual* (Transportation Research Board 2010). Each level of service is given a letter designation from A to F, with A representing free-flow operating conditions and F representing stop-and-go situations. LOS A, B, and C are generally considered to be satisfactory service levels in rural areas, while the influence of congestion becomes more noticeable at LOS D but is acceptable by many jurisdictions in urban areas. LOS E is undesirable and is generally the limit of acceptable delay. LOS F conditions are generally unacceptable. Table 3.17-2 describes the traffic flow conditions represented by each of the six levels of service.

Table 3.17-2 Level of Service Grades

LEVEL OF SERVICE	DEFINITION
A	Free-flowing condition where vehicle operation is unaffected by other vehicles.
B	Free-flowing traffic conditions, but increased traffic begins to have a noticeable effect on speed and maneuverability.
C	Traffic flow and efficiency begin deteriorating. Vehicle speed and movement become affected by increased congestion.
D	Traffic reaches an unstable flow rate. Congestion begins to severely affect both vehicle speed and movement.
E	Traffic operations are unstable and roadways are at or near capacity.
F	Forced or breakdown traffic flow.

For the transportation study area, generalized daily service volumes from the *Highway Capacity Manual* (Transportation Research Board 2010) were used to estimate LOS based on traffic counts from 2016 obtained from ADOT. This generalized *Highway Capacity Manual* methodology includes accounting for the peak hour (the traffic period with the heaviest traffic flow) and directional variation (the direction that is experiencing more traffic) of each segment.

Interstate Roadways

I-10, the southernmost cross-country Interstate highway providing east-west access from Santa Monica, California, to Jacksonville, Florida, traverses the full extent of the transportation study area. In general, average annual daily traffic (AADT) on I-10 between Tonopah, Arizona, and Blythe, California (shown in Figures 3.17-2 and 3.17-3) is highest during March, when it is approximately 30 percent greater than during September.

Table 3.17-3 summarizes ADOT weekday traffic count data from March 15 to 17, 2016. These traffic count data were obtained from Count Station 100071, located on I-10 between exit 45 (Vicksburg) and exit 53 (Hovatter Road), and Count Station 100064, located on I-10 between exit 1 (Ehrenberg – Parker Highway) and exit 5 (Tom Wells Road). The count stations are shown in Figures 3.17-1a-d (Appendix 1). Table 3.17-3 indicates that I-10 in the transportation study area had the best possible LOS (LOS A) during its busiest month and shows that traffic congestion is not a concern for I-10 in the study area. The table also shows that approximately 40 percent of the traffic on I-10 consists of commercial vehicles.

Table 3.17-3 Average Weekday Traffic and Level of Service on I-10 in the Study Area

SEGMENT (STATION ID)	K[A]	D[B]	LANES	AVERAGE WEEKDAY TRAFFIC	TRUCK PERCENT	LOS B SERVICE VOLUME[C]	LOS
Between Vicksburg and Hovatter Road (100071)[d]	7	58	4	28,300	42	34,200	A
Between Ehrenburg and Tom Wells Road (100064)[e]	8	52	4	27,600	38	37,400	A

Source: ADOT 2016b. Average weekday traffic for March 15 to 17, 2016.

[a] The K-factor is the proportion of daily traffic occurring in the peak hour of the day.

[b] The D-factor is the proportion of traffic in the peak direction during the peak hour of the day.

[c] *Highway Capacity Manual* (Transportation Research Board 2010) Exhibit 10-9, Generalized Daily Service Volumes for Rural Freeway Facilities.

[d] Count Station 100071 is located on I-10 between exit 45 (Vicksburg) and exit 53 (Hovatter Road).

[e] Count Station 100064 is located on I-10 between exit 1 (Ehrenberg – Parker Highway) and exit 5 (Tom Wells Road).

As shown in Table 3.17-4, traffic counts at the two traffic interchanges on I-10 in the Quartzsite area indicate that, during the peak traffic season, about 10,000 vehicles enter or leave Quartzsite on a daily basis.

Table 3.17-4 Average Traffic Volume in the Quartzsite Area on I-10

FACILITY	COUNT STATION	FROM ROAD	EXIT TO/LEAVE FROM QUARTZSITE	FEBRUARY 2014 AADT
Interstate 10	ADOT 3403	I-10 Exit 17 J-Ramp	Leave from	6,224
Interstate 10	ADOT 3401	I-10 Exit 17 G-Ramp	Leave from	2,614
Interstate 10	ADOT 3402	I-10 Exit 17 C-Ramp	Exit to	3,176
Interstate 10	ADOT 3400	I-10 Exit 17 A-Ramp	Exit to	3,567
Interstate 10	ADOT 3413	I-10 Exit 19 J-Ramp	Leave from	698
Interstate 10	ADOT 3411	I-10 Exit 19 G-Ramp	Leave from	1,923
Interstate 10	ADOT 3412	I-10 Exit 19 C-Ramp	Exit to	2,158
Interstate 10	ADOT 3410	I-10 Exit 19 A-Ramp	Exit to	489
Total Daily Leave from Quartzsite on I-10				11,459
Total Daily Exit to Quartzsite from I-10				9,390

Source: ADOT 2014

Regional Roadways

US 95 enters the transportation study area from south of Quartzsite. At Quartzsite, it merges with I-10 and runs concurrently, heading west approximately 17 miles until it reaches the Colorado River, where it enters Blythe, and then extends north (Appendix 1, Figure 3.17-1b). For the segments of US 95 south of Quartzsite, 2016 AADT varied between 1,000 and 7,000 vehicles per day.

Table 3.17-5 summarizes ADOT traffic count data for US 95 for March 15 to 17, 2016. The two selected count stations are 102167 on US 95 between Castle Dome Mine Road/Kofa Range Road and La Paz Valley Road/County 53rd Street and 102168 on US 95 between La Paz Valley Road/County 53rd Street and Kuehn Road (I-10 Frontage Road), which represent the traffic volumes in Quartzsite for this report. These count stations are shown in Figures 3.17-1a-d (Appendix 1). LOS is based on the *Highway Capacity Manual* (Transportation Research Board 2010) Exhibit 10-9, Generalized Daily Service Volumes for Rural Freeway Facilities, and on Exhibit 14-19, Generalized Daily Service Volumes for Rural Multilane Highways.

Table 3.17-5 shows that, within Quartzsite, US 95 might have experienced LOS B weekday traffic conditions during March 2016. South of Quartzsite, the highway functioned at LOS A. The ADOT Roadway Design Guidelines allow for LOS B on rural highways with level or rolling terrain. The Quartzsite area hosts a number of tourist events and long-term visitors during the winter each year, which is when the rock and gem shows and RV shows are held. Additional information regarding the tourist events and visitors is provided in Recreation (Section 3.10) and Socioeconomics (Section 3.15). As shown in Figures 3.17-4 and 3.17-5 (Appendix 1), the highest traffic volumes generally occur between January and March.

Table 3.17-5 Average Weekday Traffic Volume and Level of Service on US 95 in the Study Area

SEGMENT (COUNT ID)	K[A]	D[B]	TOTAL LANES	AVERAGE WEEKDAY TRAFFIC	TRUCK PERCENT	LOS B SERVICE VOLUME[C]	LEVEL OF SERVICE
Between Castle Dome Mine Road/Kofa Range Road and La Paz Valley Road (102167)[d]	10	65	2	300	37	4,000	A
Between La Paz Valley Road/County 53rd Street and Kuehn Road (102168)[d]	10	61	2	900	26	3,700	B

Source: ADOT 2016b. Average weekday traffic for March 15 to 17, 2016.

[a] The K-factor is the proportion of daily traffic occurring in the peak hour of the day.

[b] The D-factor is the proportion of traffic in the peak direction during the peak hour of the day.

[c] *Highway Capacity Manual* (Transportation Research Board 2010) Exhibit 15-30, Generalized Daily Service Volumes for Two-Lane Highways.

[d] Count Station 102167 is located on US 95 between Castle Dome Mine Road/Kofa Range Road and La Paz Valley Road/County 53rd Street.

[e] Count Station 102168 is located on US 95 between La Paz Valley Road/County 53rd Street and Kuehn Road (I-10 Frontage Road).

SR 78 traverses the western transportation study area generally north-south through Blythe, California where it is also known as Neighbours Boulevard.

Local Roads

County highways, along with local access roads and farm field roads, are the most abundant form of transportation infrastructure along the Proposed Action and Alternative Segments and in the overall transportation study area. The Project crosses Arizona SR 95, which is a two-lane paved road on Arizona state trust land in the Quartzsite area, and California SR 78, which is a two-lane paved road on private property in the Blythe area.

In Arizona, the Project crosses many two-lane gravel or dirt roads on lands managed by the BLM, the USFWS (Kofa NWR), Reclamation, the DOD (YPG), the state of Arizona, the state of California, or on private land. Roads on private land include Indian School Road, Salome Road, Eagle Eye Road, and Avenue 75E in the East Plains and Kofa Zone; Old Yuma Road and Boyer Road near Quartzsite; and Ehrenberg-Cibola Road and Ox Bow Road in the Copper Bottom Zone. There are many two-lane paved farm field roads over private property in the Colorado River and California Zone of the Project Area, including Intake Boulevard, Broadway Boulevard, and Lovekin Boulevard near Blythe.

In addition to gravel or dirt roads, utility access roads and recreational trails are present in the transportation study area, including the El Paso Natural Gas Company utility access roads on BLM-administered land, the DPV1 structure dirt access trails on BLM and Arizona state trust land, and the dirt access road on BLM-administered land leading to Copper Bottom Pass.

In California, the Project Area crosses mainly uninhabited farmland. Public roads are intersected by farm field lines and quarter section lines that provide access to farm fields. There are several public one- or two-lane dirt roads in the Colorado River and California Zone, including Intake Boulevard, 7th Street, Broadway Boulevard, Lovekin Boulevard, Defrain Boulevard, Arrowhead Boulevard, Rannells Boulevard, and Ludy Boulevard. There are also several agricultural field perimeter roads and canal roads on private property in the transportation study area.

More detailed information, including the location and land ownership of these local roads, by segment is provided in the baseline report (HDR 2017i, Appendix A). Traffic count data are unavailable for local roads, which are generally low-volume unpaved facilities. The Transportation Research Board Committee on Low-Volume Roads identified 400 vehicles per day as the typical upper limit for lightly traveled gravel or dirt roads (Transportation Research Board 2000).

Off-Highway Vehicle Routes

There are approximately 1,901 miles of OHV routes within the Lake Havasu, YFO, and Palm Springs planning areas in the traffic and transportation study area. Of those 1,901 miles, approximately 250 miles are under BLM jurisdiction, meaning the BLM has the authority to designate uses of the route (Table 3.17-6). Within the traffic and transportation study area, just under 57 miles of routes are designated as open for all uses. The remaining routes are not yet designated or are not under the jurisdiction of the BLM. Section 3.10 provides further information related to OHV routes.

Table 3.17-6 OHV Routes in the Traffic and Transportation Study Area by Geographic Area

GEOGRAPHIC AREA	NUMBER OF TRAILS[A]	MILES OF TRAILS	MILES UNDER BLM JURISDICTION	MILES OPEN	MILES OF LIMITED USE	MILES CLOSED
East Plains and Kofa Zone[b]	2,297	800.2	244.7[c]	51.4	0.0	0.0
Quartzsite Zone[b]	1,039	281.2	0.0	0.0	0.0	0.0
Copper Bottom Pass Zone	867	262.3	NA	NA	NA	NA
Colorado River and California Zone	827	557.3	5.4	5.4	0.0	0.0
Total	5,030	1,901.0	250.1	56.8	0.0	0.0

Source: GIS data from the BLM Lake Havasu and Yuma field offices in Arizona and the BLM California Office

[a] The number of trails is based on GIS segment and could represent multiple segments of the same trail.

[b] The mileage presented under BLM jurisdiction and as open, limited use, or closed might not be fully representative of the OHV trails in the area, as the data for the Quartzsite area did not contain information on these classifications.

[c] Of these 244.7 miles, 8.1 are noted by the Lake Havasu Field Office as "undesignated routes."

NA = data not available

3.17.3.2 Aviation

The majority of the aviation facilities within the Project Area are used for general aviation and non-primary commercial service airports. The designation of an airport facility type is important when determining the airspace regulations governing development restrictions. Development guidelines around airports without precision instrument guidance systems for assisting airplanes as they approach for landing are generally less restrictive compared with airports with precision instrument guided landing capabilities. More specifically, airports without precision instrument guidance systems generally have smaller glide slope restrictions compared to larger airports with frequent flights.

Of particular interest with regard to aviation and transmission facilities are the vertical and horizontal clearances for runways at airport facilities, governed by the ascent and descent requirements of different sizes and propulsions of aircraft. These clearances are referred to as "surfaces" and include transitional, conical, primary, and horizontal surfaces. Note that different classes of airports have different characteristics in terms of the physical dimensions of the airport runways, the class size of aircraft capable of landing at the airport, and the clearance required allowing safe airplane landing and proper operation of navigation and communication systems. These factors determine the take-off and landing glide slopes necessary for safe flight operation, which in turn determine the setback distance of transmission line structures.

Transmission line construction is regulated near public airports because of FAA height restrictions, which prohibit transmission line structures above a certain height, depending on the distance from the specific airport. Regulatory obstruction standards apply only to those airports that are available for public use and are listed in FAA's airport directory. Private airports, with the exception of heliports, must be certified by the FAA under 14 CFR 139 and may not be used by the general public without prior request and approval. Privately operated airports must also adhere to Arizona Revised Statutes for aviation (ARS 40-1 through 40-8) and the California Code of Regulations for airports and heliports (21 CCR 3525–3560). For every 50 feet horizontally from the edge of the runway surface, a vertical structure may rise 1 foot above ground. With regard to the Project, this setback distance applies to the Blythe Airport, since it is the one public airport in the Project Area. For any structure that does not meet the slope requirement within the setback distance of 10,000 feet of the Blythe Airport, consultation would be required with the FAA regional office.

Aviation facilities within 5 miles of the Proposed Action and Alternative segments are listed in Table 3.17-7 with distances shown from the identified proposed or alternative segment to each airport property boundary. Proposed Action and Alternative segments that are not within 5 miles of an airport are not included in the table. The locations of airports near the Project Area are shown in Figures 3.17-1a-d (Appendix 1) and are discussed by segment later in this Technical Environmental Study.

Table 3.17-7 Distance in Miles between Airport Property Boundaries and Proposed Action and Alternative Segments

SEGMENT	BLYTHE AIRPORT (BLH)	CYR AVIATION	BLYTHE SERVICE CENTER HELIPORT	CLAYTON HELIPORT	MAULDIN AIRSTRIP	TONOPAH AIRPORT	SALOME EMERGENCY AIRFIELD
p-01	—	—	—	—	1.7	4.3	—
p-04	—	—	—	—	—	—	3.9
p-05	—	—	—	—	—	—	3.1
p-06	—	—	—	—	—	—	3.1
p-15w		3.8	4.7	4.7	—	—	—
p-16	—	—	—	4.8	—	—	—
d-01	—	—	—	—	1.7	—	—
i-01	—	—	—	—	—	—	2.7
i-02	—	—	—	—	—	—	1.4
i-03	—	—	—	—	—	—	1.8
i-08s	—	4.0	4.0	—	—	—	—
ca-01	—	1.7	2.5	2.6	—	—	—
ca-02	3.6	3.9	4.3	2.8	—	—	—
ca-04	—	3.2	3.2	—	—	—	—
ca-05	—	0.3	1.1	1.1	—	—	—
ca-06	2.2	3.5	3.7	1.6	—	—	—
ca-07	2.2	—	—	4.0	—	—	—
ca-09	3.4	—	—	—	—	—	—
x-01	—	—	—	—	—	—	2.8
x-02	—	—	—	—	—	—	2.7
x-03	—	—	—	—	—	—	0.3
x-04	—	—	—	—	—	—	2.6

SEGMENT	BLYTHE AIRPORT (BLH)	CYR AVIATION	BLYTHE SERVICE CENTER HELIPORT	CLAYTON HELIPORT	MAULDIN AIRSTRIP	TONOPAH AIRPORT	SALOME EMERGENCY AIRFIELD
x-09	—	3.1	3.2	—	—	—	—
x-10	—	3.2	3.3	—	—	—	—
x-11	—	3.6	4.0	—	—	—	—
x-12	3.7	3.5	3.7	1.6	—	—	—
x-13	4.7	3.9	4.3	2.8	—	—	—
x-15	2.2	—	—	4.0	—	—	—
x-16	3.7	—	—	—	—	—	—

Source: Google Earth

The Blythe Airport is the primary airport serving the Blythe, California, area and is 6 miles west of Blythe. It is open to the public and is owned by Riverside County (Appendix 1, Figure 3.17-1d). The airport's primary use is for general aviation, but it does not receive any commercial air traffic. The facility has two paved runways: the north-to-south runway (Runway 17/35) and the east-to-west runway (Runway 8/26). It averages 69 aircraft per day (Airnav.com 2016). The City of Blythe General Plan states that the Blythe Airport is anticipated to grow in future years. This expansion would allow for expanded capacity and air service to the region and would provide training grounds for pilots. The expansion would also be necessary for new types of jets or other aircraft wishing to use the facility. Because of the restriction posed by the presence of I-10 and Mesa Drive immediately south of the airport, expansion of airport facilities could occur only to the north. The Proposed Action and Alternative segments in this area are located at least 1.1 mile south of the airport.

Cyr Aviation Airport is located south of Blythe and is immediately north of Seeley Avenue along Lovekin Boulevard, as shown in Figure 3.17-1d (Appendix 1). This is a privately owned and operated airstrip. Aerial images suggest that the 20-foot-wide runway is paved, though capable of handling only small, single-propeller-powered aircraft used for agricultural (e.g., crop spraying) and recreational flying (Google Earth May 2014). Review of aerial photographs did not indicate the presence of either passenger-waiting or baggage-handling facilities. The runway is approximately 2,000 feet long, aligned north to south.

Mauldin Airstrip is located 3 miles southwest of Tonopah, Arizona, at the eastern end of the Project Area (Appendix 1, Figure 3.17-1a). This airstrip is for private use only, and aircraft must have permission to land. The 2,900-foot-long runway is aligned northwest-to-southeast and is gravel, so it can be used for small aircraft only (Airnav.com 2016).

The Tonopah Airport is located 3 miles northwest of Tonopah, Arizona (Appendix 1, Figure 3.17-1a). It is for private use only and has a 3,100-foot-long northwest-to-southeast dirt runway, for which permission is required to land (Airnav.com 2016).

Within the transportation study area, there are two heliports (Appendix 1, Figure 3.17-1d). The Blythe Service Center Heliport is on the western edge of Blythe, California, just south of I-10. It is for private use only, and permission is required to land. It is used for helicopters; the landing surface is a gravel pad, 150 feet by 150 feet (Airnav.com 2016). Clayton Heliport is located 3 miles south of Blythe. The landing surface is 150 feet by 125 feet and is composed of dirt (Airnav.com 2016). In addition to the heliports, the Salome Emergency Airfield (Appendix 1, Figure 3.17-1a) is located 40 miles west of Quartzsite and 2 miles south of I-10 in La Paz County, Arizona, but this airfield has not been used in many years. Aerial images (Google Earth November 2015) suggest there are two 4,000-foot-long unpaved runways: the north-to-south runway and the east-to-west runway.

Table 3.17-8 shows the number of aircraft based at each airport identified. In addition to the airports in the transportation study area, the Yuma Marine Corps Air Station/Yuma International Airport, located 65 miles south of Blythe, is also included, as the general aviation traffic between Blythe and Yuma may travel along aviation route V-135.

The operations at the airports in the vicinity of the transportation study area are shown in Table 3.17-9. The number of takeoffs and landings for the 12-month period ending December 31, 2015, is presented for each airport or airstrip.

General aviation traffic between Blythe, California, and Yuma, Arizona, may travel along Route V-135, shown in the FAA Phoenix Sectional Aeronautical Chart, 95th edition, effective through October 13, 2016 (FAA 2016a). East-to-west general aviation traffic between Blythe and Phoenix travels on Route V-94. Also, the AGFD utilizes helicopters and fixed-wing aircraft to conduct aerial wildlife surveys in the Plomosa and Dome Rock Mountains.

Table 3.17-8 Number of Fixed-wing Aircraft Based at Airports near the Transportation Study Area

AIRCRAFT TYPE	YUMA (NYL)	BLYTHE (BLH)	CYR AVIATION	BLYTHE SERVICE CENTER HELIPORT	CLAYTON HELIPORT	MAULDIN AIRSTRIP	TONOPAH AIRPORT
Single-engine	55	4	8	0	0	0	3
Multiengine	23	2	1	0	0	1	0
Jet	2	0	0	0	0	0	0
Total fixed-wing	80	6	9	0	0	1	3
Helicopter	1	0	0	0	3	0	0
Glider	0	0	0	0	0	0	0
Military	78	0	0	0	0	0	0
Ultralight	1	0	0	0	0	0	0

Source: FAA 2016b

Table 3.17-9 Airport Operations for Yuma and Blythe Airports in 2015

AIRCRAFT TYPE	TAKEOFFS AND LANDINGS	
	YUMA (NYL)	BLYTHE (BLH)
Air carrier	18,814	0
Air taxi	0	0
General aviation local	45,981	12,500
General aviation itinerant	13,546	12,500
Military	109,158	150
Total	187,499	25,150

Source: FAA 2016b. Data for other airports were not available.

Military Training Routes

The YPG has restricted portions of airspace in the study area for training flights in low-altitude conditions, which are conducted along MTRs. The airspace is not completely off limits to private or commercial flights, but these flights are restricted by the YPG or other military users to periods of non-use. MTRs are aerial corridors across the US in which military aircraft can operate below 10,000 feet at faster speeds than specified for Class B airspace. At elevations below 10,000 feet in Class B airspace,[11] aircraft normally are required to operate at speeds less than 250 knots. The MTRs in the study area are shown in Figure 3.17-6 (Appendix 1) and include:

- IR-218: altitude range 500 to 6,000 feet
- VR-231: altitude range 100 to 7,000 feet
- VR-242: altitude range 300 to 9,000 feet
- VR-243: altitude range 300 to 9,500 feet
- VR-245: altitude range 300 to 9,000 feet

IR indicates routes that are instrument routes, and VR indicates routes that are visual routes. These MTRs are considered special-use airspace by the FAA (FAA Order JO 7400.8Y). Special-use airspace is designated by bounding coordinates, designated altitudes, times of designation, controlling agency, and using agency. Within these areas, use is restricted unless a user has advance permission from either the using or the controlling agency. The using agency for the MTRs in the transportation study area is the US DOD, and the contact is the US Army Commanding Office for the YPG. The controlling agency is the FAA Los Angeles Air Route Traffic Control Center. The times of restriction for all five MTRs in the study area are continuous. The floor altitude of MTRs varies with location within the MTR. Although VR-231 has a minimum floor altitude of 100 feet, where VR-231 crosses I-10 and just north of the YPG the floor altitude is 200 feet (Lottinger pers. comm. 2018). The DOD stated that Project structures shall remain less than 199 feet high to avoid impacts to MTRs (DOD 2016).

3.17.3.3 Freight and Rail Transportation

The Arizona State Freight Plan (ADOT 2015) shows that most goods movement in the transportation study area occurs along I-10 and in the urbanized areas of Blythe and Quartzsite. Traffic counts show that over 10,000 trucks per day pass through the study area. The Arizona State Freight Plan states, "I-10 is the single most important freight transportation facility serving Arizona measured by value of trade, providing a conduit to Arizona's two largest domestic trading partners of California and Texas." Overall reliability along the corridor is good, although population growth in Phoenix and Tucson are expected to increase truck activity and passenger traffic (ADOT 2015).

[11] *Controlled airspace* is a generic term that covers the different classifications of airspace (Class A, B, C, D, and E airspace) and defined dimensions within which air traffic control service is provided to instrument flight rules (IFR) flights and to visual flight rules (VFR) flights in accordance with the airspace classification. Class B is airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports in terms of IFR operations or passenger enplanements. The configuration of each Class B airspace area is individually tailored and consists of a surface area and two or more layers, and is designed to contain all published instrument procedures once an aircraft enters the airspace (FAA 2016c).

No active railroad facilities were found within the transportation study area. An abandoned railroad line was identified south of Blythe that was once used for transporting agricultural goods between Ripley, California, and Blythe. Although the Riverside County Transportation Commission is studying potential passenger rail connections from Los Angeles into the Coachella Valley at Indio, the agency does not identify plans for this abandoned railroad line.

3.17.3.4 Zone-specific Conditions

East Plains and Kofa Zone

Between the Delaney Substation and Quartzsite, the transportation study area is predominantly uninhabited desert (Appendix 1, Figure 3.17-1a). The alignment of the Project parallels the existing DPV1 ROW within a designated utility corridor or would be adjacent to the DPV1 ROW. Access to the existing transmission line is provided mostly along privately owned and restricted utility roads that are not designed for normal vehicular traffic.

The existing roadways within 5 miles of the Proposed Action and Alternative segments within the East Plains and Kofa Zone include 77 miles of I-10, 26 miles of US highways (US 60 and US 95), 8 miles of state highways (SR 95 and Business Route 10), 687 miles of local streets and roads, and 1,048 miles of unclassified roads and trails. The numbers of miles of US 60 and US 95 that are contiguous with I-10 are 13 miles and 0.6 mile, respectively, and are omitted from the above totals. The number of miles of each road type located within 5 miles of each segment is provided in the baseline report (HDR 2017i, Appendix B).

A large number of OHV trails were identified in the transportation study area, which includes a mix of Federal, state trust, and private lands. About 800 miles of OHV trails were identified within 5 miles of the Proposed Action and Alternative segments in the East Plains and Kofa Zone. About 245 miles of these OHV trails are under the BLM's jurisdiction, of which just over 51 miles are classified as "open" or "open to all uses." The remaining trails either are not yet designated or are not under the BLM's jurisdiction. There are additional tertiary routes on BLM-administered land north of Proposed Action Segment p-01, as well as additional OHV areas south of alternative Segment d-01 that are designated as "limited to designated routes." See Recreation, Section 3.10, for more information on OHV trails.

The roadway projects listed in Table 3.17-10 are planned near the Proposed Action and Alternative segments in this zone, totaling 58 miles of roadway reconstruction (La Paz County 2010b). According to the La Paz County Public Works Department and Maricopa County Department of Transportation, no road or area is inaccessible by the public within the study area due to current or planned transportation projects or construction.

Table 3.17-10 Planned Roadway Projects in the East Plains and Kofa Zone

FACILITY	PROJECT TYPE	LOCATION	LENGTH (MILES)
I-10	Reconstruct interchange	All interchange locations (by 2030)	N/A
Salome Highway	Reconstruct roadway	US 60 to I-10	38.2
Vicksburg Road	Reconstruct roadway; add passing lanes	I-10 to SR 72	19.6
Total			57.8

Source: La Paz County 2010b. N/A = not applicable

Proposed Action Segments p-01 through p-06

With the exception of I-10, most roads in the study area are lightly traveled two-lane gravel or dirt roads. Because the Proposed Action segments parallel the existing DPV1 ROW, several utility access roads (including the existing DPV1 structure dirt access roads and El Paso Natural Gas Company utility access roads) could provide construction access to the Proposed Action segments. Traffic counts were not conducted on gravel or dirt roads; however, the Transportation Research Board Committee on Low-Volume Roads (Transportation Research Board 2000) identified 400 vehicles per day as the typical upper limit for lightly traveled gravel or dirt roads.

In this zone, three airstrips are within the transportation study area for the Alternative segments. The FAA Phoenix Sectional aeronautical chart shows the private Tonopah Airport, the abandoned Salome Emergency Airfield, and the private Mauldin Airstrip (Section 3.17.3.2). As presented in Table 3.17-7, the Tonopah Airport is approximately 4.3 miles from Proposed Action Segment p-01, and the Mauldin Airstrip is approximately 1.7 miles from Segment p-01. Segments p-04, p-05, and p-06 are within 5 miles of the Salome Emergency Airfield, and the distances between the airfield and these segments vary from 3.1 miles to 3.9 miles. Proposed Action Segment p-06 crosses MTR VR-243/245, Proposed Action Segment p-05 crosses MTR VR-231, Proposed Action Segment p-04 crosses MTR VR-231, and Proposed Action Segment p-03 crosses MTRs IR-218 and VR-242.

Alternative Segments d-01, i-01 through i-04, in-01, and x-01 through x-04

With the exception of I-10 and US 60, most roads near these segments are low-volume unpaved roads. The Alternative segments would traverse several existing utility/recreation access roads and dirt trails, which could provide construction access. Traffic counts were not conducted on gravel or dirt roads; however, the Transportation Research Board Committee on Low-Volume Roads (Transportation Research Board 2000) identified 400 vehicles per day as the typical upper limit for lightly traveled gravel or dirt roads.

In this zone, two airstrips are within the transportation study area for the Alternative segments. The FAA Phoenix Sectional aeronautical chart shows the abandoned Salome Emergency Airfield and the private Mauldin Airstrip (Section 3.17.3.2). Alternative Segment d-01 is about 1.7 miles from the Mauldin Airstrip. As presented in Table 3.17-7, there are seven Alternative segments within 5 miles of the Salome Emergency Airfield, and the distances between the airfield and these segments vary from 0.3 mile to 2.8 miles. Alternative Segments i-02 and x-03 cross MTR VR-231, Alternative Segments i-01, i-03, i-04, and x-01 cross MTRs VR-242, VR-243/245, and alternative Segment x-04 crosses MTR IR-218.

Quartzsite Zone

Quartzsite is in southwestern La Paz County and is at the crossroads of I-10 and US 95 as discussed above (Appendix 1, Figure 3.17-1b); Quartzsite receives an influx of tens of thousands of visitors each winter—many of whom stay for the winter in recreational vehicles on BLM-administered land or in private RV parks. Additional information on the visitors can be found in the Recreation and Socioeconomic sections (Section 3.10 and Section 3.15). The peak traffic on US 95 in the study area occurs between January and March. The peak traffic on US 95 in January is about seven times the peak traffic in July (Section 3.17.3.1), resulting in the town's roadways being more congested during the winter.

Within 5 miles of the Quartzsite Zone segments, there are 18 miles of I-10, 15 miles of US highways (US 95 and US 60), 10 miles of state highways (SR 95 and Business Route 10), 189 miles of local streets and roads, and 318 miles of unclassified roads and trails. The numbers of miles of US 60 and US 95 that are contiguous with I-10 are 18 miles and 8 miles, respectively, and are omitted from the above totals. The number of miles of each road type located within 5 miles of each segment is provided in the baseline report (HDR 2017i, Appendix B).

A large number of OHV trails were identified in the transportation study area, which includes a mix of Federal, state trust, and private land. Approximately 1,039 miles of OHV trails are within 5 miles of the Proposed Action and Alternative segments in this zone. Of this, just over 280 miles are under the jurisdiction of the BLM; however, these routes have not yet been assigned a designation. These data represent only a portion of the geographic area outside the La Posa Travel Management Area. The area within the La Posa Travel Management Area, which includes all of Quartzsite and a larger area running south along US 95, is classified as limited OHV use. Section 3.10, Recreation includes more detail on OHV trails.

Table 3.17-11 lists the roadway projects planned in the transportation study area (La Paz County 2010b). These proposed projects would add about 73 miles of new road construction.

According to the La Paz County Public Works Department and the Town of Quartzsite Transportation Department, no road or area is currently inaccessible to the public within the study area due to current or planned transportation projects or construction. However, given the geography of Quartzsite, roads are subject to closure depending on weather conditions. During the rainy season, flooded washes can bring rocks and tree branches onto the streets and block roadways, in addition to flooding the streets with water. In these cases, roads can be closed until the public works department clears the affected streets.

Table 3.17-11 Planned Roadway Projects in the Quartzsite Zone

FACILITY	PROJECT TYPE	LOCATION	LENGTH (MILES)
SR 95/US 95	Add passing lanes	Quartzsite northern boundary to SR 72	23.5
		Kuehn Street to SR 95, milepost 99	6.0
		Subtotal	29.5
SR 95/US 95	Widen to four lanes	Quartzsite to northern county boundary	16.9
SR 95/US 95	Widen to four-lane divided highway	Milepost 70.2 to southern county boundary	12.2
SR 95/US 95	Add passing lanes	Milepost 99 and southern county boundary	10.3
I-10	Reconstruct interchange	All interchange locations (by 2030)	N/A
Kuehn Street	Widen to four lanes and reconstruct, including drainage structures	Riggles Avenue to Quartzsite Boulevard	2.9
Quartzsite Boulevard	Widen to four lanes	Main Street to Kuehn Street	0.3
Riggles Avenue	Widen to four lanes	Main Street to Kuehn Street	0.6
Kofa Avenue	Widen to four lanes	Main Street to Kuehn Street	0.2
Total			72.9

Source: La Paz County 2010b
N/A = not applicable

Proposed Action Segments p-07, p-08, and p-09

With the exception of US 95, most roads directly crossed by the Proposed Action segments are lightly traveled two-lane gravel or dirt roads on BLM-administered land. Three existing utility access roads and local dirt trails on BLM-administered land could provide construction access for the Proposed Action segments because they cross or are within 5 miles of these segments. These roads and trails are the El Paso Natural Gas Company utility access road, the DPV1 dirt access road, and the dirt access road leading to Copper Bottom Pass. Traffic counts were not conducted on gravel or dirt roads; however, the Transportation Research Board Committee on Low-Volume Roads (Transportation Research Board 2000) identified 400 vehicles per day as the typical upper limit for lightly traveled gravel or dirt roads.

The FAA Phoenix Sectional aeronautical chart shows that no aviation facilities are within the transportation study area for the Quartzsite geographic area (FAA 2016a). No Proposed Action segment crosses any MTRs in this geographic area.

Alternative Segments i-05, qn-01, qn-02, qs-01, qs-02, x-05, x-06, and x-07

With the exception of I-10 and US 95, most roads near the Alternative segments are lightly traveled two-lane gravel or dirt roads and one-lane utility access dirt trails. Given that these Alternative segments are close to the Town of Quartzsite, many local streets and roads and other transportation facilities have been identified within 5 miles. Several existing BLM-administered land access roads and trails in this area could provide construction access to the Alternative segments. Traffic counts were not conducted on gravel or dirt roads; however, the Transportation Research Board

Committee on Low-Volume Roads (Transportation Research Board 2000) identified 400 vehicles per day as the typical upper limit for lightly traveled gravel or dirt roads.

The FAA Phoenix Sectional aeronautical chart shows that no aviation facilities are within the transportation study area for the Quartzsite Zone (FAA 2016a). Alternative Segments x-05, x-06, qs-01, and qn-02 cross MTR IR-218.

Copper Bottom Zone

The Copper Bottom Zone is in southwestern La Paz County, south of Quartzsite and Ehrenberg, Arizona. This area has limited land development and few access roads (Appendix 1, Figure 3.17-1c). Within 5 miles of the Copper Bottom Zone are 24 miles of I-10, 9 miles of US highways (US 60 and US 95), 6 miles of state highway (SR 1 and SR 95, and Business Route 10), 302 miles of local streets and roads, and 355 miles of unclassified roads and trails. The numbers of miles of US 60 and US 95 that are contiguous with I-10 are 19 miles and 18 miles, respectively, and are omitted from the above totals. The number of miles of each road type located within 5 miles of each segment is provided in the baseline report (HDR 2017i, Appendix B).

About 867 miles of OHV trails have been identified on a mix of Federal, state trust, and private land within the transportation study area in the Copper Bottom Zone. These include approximately 262 miles of OHV trails under the jurisdiction of the BLM; however, information is not available regarding the designations of these trails. See Section 3.10 for additional information on OHV trails.

About 0.5 mile of new road construction is planned near the Proposed Action and Alternative segments in this zone (La Paz County 2010b). These projects are described in Table 3.17-12. According to the La Paz County Public Works Department, no road or area is currently inaccessible to the public within the transportation study area due to current or planned transportation projects or construction.

Table 3.17-12 Planned Roadway Projects in Arizona in the Copper Bottom Pass Zone

FACILITY	PROJECT TYPE	LOCATION	LENGTH (MILES)
I-10	Reconstruct interchange	All locations (by 2030)	N/A
Juneau Avenue	Reconstruct roadway to minor arterial standard in 2020 and then to higher two-lane road standard in 2030	I-10 exit 1 to Ehrenberg Parker Highway	0.4
Total			0.4

Source: La Paz County 2010b.
N/A = not applicable

Proposed Action Segments p-09 through p-14

The area traversed by these Proposed Action segments is uninhabited desert and parallels the existing DPV1 ROW. The majority of roads near these Proposed Action segments are exiting utility/communication tower access roads and dirt trails, which could potentially be used during construction and operation of the Project. Roads in this area are limited because of the area's rural nature and the mountainous terrain, including CRIT lands to the east of Proposed Action Segment p-11. As discussed in Section 3.17.3.1, traffic volumes on these unpaved local roads are unavailable; however, traffic on unpaved roads is typically less than 400 vehicles per day (Transportation Research Board 2000).

Alternative Segments cb-01 through cb-06, i-06, i-07, and x-08
The area crossed by these Alternative segments is uninhabited and relatively undisturbed desert. No identified or known roads serving the area are crossed by the Alternative segments, except for communications tower/DPV1 access roads and recreation trails on BLM-administered land. As discussed in Section 3.17.3.1, traffic volumes on existing unpaved local roads are unavailable; however, traffic on unpaved roads is typically less than 400 vehicles per day (Transportation Research Board 2000).

Two airports have been identified within the transportation study area for the Alternative segments in the Copper Bottom Zone: the private Cyr Aviation Airport and the SCE Blythe Service Center Heliport (Table 3.17-7). These facilities are located along I-10 in Blythe and are 3 to 4 miles from Alternative Segments i06 and i-07. No Alternative segment crosses any MTRs in this geographic area.

Colorado River and California Zone

In the Colorado River and California Zone, the Proposed Action segments are all south of Blythe and north of Ripley, California in this area (Appendix 1, Figure 3.17-1d). As with the Proposed Action segments in Arizona, the Proposed Action segments in California continue to follow existing utility corridors and would be parallel with the existing DPV1 ROW. However, unlike in La Paz County and western Maricopa County in Arizona, the land character south of Blythe is predominantly agricultural. More public roads are present in this zone than in the others because of the presence of the city of Blythe and the agricultural land use. The city of Blythe is located approximately 4 miles north of the Proposed Action segments, which are located in unincorporated lands of Riverside County.

Within 5 miles of the Colorado River and California Zone segments, there are 27 miles of I-10, 19 miles of US highways (US 60, US 78, and US 95), 16 miles of state highway (SR 1 and SR 78), 446 miles of local streets and roads, and 259 miles of unclassified roads and trails. The numbers of miles of US 60 and US 95 that are contiguous with I-10 are 5 miles for each route and are omitted from the above totals. The number of miles of each road type located within 5 miles of each segment is provided in the baseline report (HDR 2017i, Appendix B).

Within the Colorado River and California Zone portion of the transportation study area, there are approximately 827 miles of OHV trails, of which approximately 557 miles are under the jurisdiction of the BLM. The BLM has designated just under 5.5 miles of these trails as “open” or “open to all uses.” The OHV trails in this area can be found on Federal, state trust, and private land. Because the California BLM identifies trails using aerial images, OHV trails in the area include dirt roads in agricultural areas. See recreation (Section 3.10) for additional information on OHV trails.

According to the City of Blythe General Plan 2025 and Palo Verde Valley Transportation Master Plan, the roadway projects listed in Table 3.17-13 are planned near the Proposed Action and Alternative segments in this zone. The total planned new road construction is about 63 miles.

According to the Riverside County Transportation and Land Management Agency, no roads in the study area are inaccessible to the public due to current or planned transportation projects or construction (E. Sarabia, Riverside County Transportation and Land Management Agency, personal communication August 22, 2016).

Table 3.17-13 Planned Roadway Projects in California in the Colorado River and California Zone

FACILITY	PROJECT TYPE	LOCATION	LENGTH (MILES)
Seeley Avenue or 18th Avenue	Extend roadway	East to Riviera Drive	0.3
Neighbours Boulevard	Extend roadway	North to 6th Avenue	3.0
Lovekin Boulevard	Widen shoulders	Specific location not available	10.0
	Construct bicycle route	Specific location not available	16.5
		Subtotal	26.5
14th Avenue	Widen by adding one lane in each direction	Lovekin Boulevard to Intake Boulevard	2.4
Broadway	Widen by adding one lane in each direction	10th Avenue to Chanslor Way	1.2
7th Street	Widen by adding one lane in each direction	10th Avenue to Chanslor Way	1.2
		I-10 to below 14th Avenue	0.6
		Subtotal	1.8
Chanslor Way	Widen by adding one lane in each direction	DeFrain Boulevard to Intake Boulevard	3.6
Intake Boulevard	Widen by adding one lane in each direction	10th Avenue to below 14th Avenue	2.5
Lovekin Boulevard	Widen by adding one lane in each direction	10th Avenue to Chanslor Way I-10 to Seeley Avenue	1.2
Mesa Drive	Widen by adding one lane in each direction	Hobsonway to south of I-10	1.5
Hobsonway	Widen by adding one lane in each direction	Mesa Drive to Buck Boulevard	3.0
Ehlers Boulevard	Construct roadway	Chanslor Way to Hobsonway	0.6
Date Street	Construct roadway	Hobsonway to north of Chanslor Way	0.6
Barnard Street	Construct roadway	San Jacinto Way to Ehlers Boulevard Tesoro Lane to Intake Boulevard	0.1
Olive Lake Boulevard	Construct roadway	Chanslor Way to 6th Avenue	3.6
SR 78	Realign roadway to Mesa Drive alignment	32nd Avenue to Mesa Drive	10.8
Hobsonway	Relocate roadway	Approach to Mesa Drive	N/A
Buck Boulevard	Construct four-lane road	Along Buck Boulevard alignment	N/A
Intake Boulevard/Mesa Drive	Reconstruct interchange	Intake Boulevard interchange and Mesa Drive interchange	N/A

FACILITY	PROJECT TYPE	LOCATION	LENGTH (MILES)
Hobsonway and Lovekin Boulevard	Improve intersection	Hobsonway and Lovekin Boulevard	N/A
Hobsonway and Intake Boulevard	Improve intersection	Hobsonway and Intake Boulevard	N/A
Lovekin Boulevard and I-10 ramps	Improve intersection	Lovekin Boulevard and I-10 ramps	N/A
Total			62.7

Sources: City of Blythe 2007; Riverside County 2014b

N/A = not applicable

Proposed Action Segments p-15e through p-18

With the exception of I-10, most roads in the study area in the Colorado River and California Zone geographic area are lightly traveled one- or two-lane paved or dirt roads. Numerous agricultural field and canal roads across private property were identified near Blythe. There are several dirt access trails for the DPV1 line on BLM-administered land and private property. Traffic levels on local roads are negligible, based on the nearest points where AADT data are collected. Public roads experience LOS A operating conditions during normal days and nights due to the negligible traffic volumes.

In this zone, three aviation facilities are within the study area for the Proposed Action segments: the private SCE Blythe Service Center Heliport, which is 4.7 miles from Proposed Action Segment p-15w; the private Cyr Aviation Airport, which is 3.8 miles from Segment p-15w; and the private Clayton Heliport, which is 4.7 miles from Segment p-15w (Table 3.17-7). All of these facilities are located along I-10 in Blythe. No Proposed Action segment crosses any MTRs in this geographic area.

Alternative Segments ca-01, ca-02, ca-04 through ca-07, ca-09, cb-10, i-08s, and x-09 through x-19

With the exception of I-10, most roads near these Alternative segments are lightly traveled one- or two-lane gravel or dirt roads and utility access dirt trails. Given the close proximity of these Alternative segments to Blythe, many local streets, roads, and other transportation facilities including local airports have been identified within 5 miles. Traffic levels on local roads are negligible, based on the nearest points where AADT data are collected. Public roads experience LOS A operating conditions during normal days and nights due to negligible traffic volumes.

In this zone, four aviation facilities are within the study area for the Alternative segments: the public Blythe Airport, the private Blythe Service Center Heliport, the private Cyr Aviation Airport, and the private Clayton Heliport. Segment ca-05 is the closest segment, at 0.3 miles from the Cyr Aviation Airport. Segment ca-01 is less than 3 miles from these airports while Segment ca-02 is 2.8 to 4.3 miles from the aviation facilities, Segment i-08s is 3 to 4 miles from the Cyr Aviation Airport and the Blythe Service Center Heliport, and Segment ca-09 is 3.4 miles from the Blythe Airport. Segments x-09 through x-16 are between 1 and 5 miles from these aviation facilities. Segment x-12 is the closest to aviation facilities at about 1.5 miles (Table 3.17-7). No alternative segment crosses any MTRs in this zone.

3.18 VISUAL RESOURCES

3.18.1 Applicable Laws, Regulations, Policies, and Plans

The following section summarizes Federal, state, and local laws, regulations, and standards that govern visual resources across the Project Area, in addition to relevant plans and policies.

3.18.1.1 Federal

On the Federal level, NEPA (42 USC 4321–4347) serves as the primary legislation requiring Federal agencies, such as the BLM, to "assure for all Americans … aesthetically pleasing surroundings" and to "utilize a systematic, interdisciplinary approach, which would ensure the integrated use of … environmental design in the planning and decision-making process." NEPA also directs Federal agencies to assess impacts, adverse and otherwise, on the environment.

BLM

BLM Manual Section 8400 Visual Resource Management (BLM 1984) sets forth the policy and direction for VRM, in which its objective "is to manage public lands in a manner which will protect the quality of the scenic (visual) values of these lands." This manual follows the Federal Land Policy and Management Act of 1976 (43 USC 1701 Sec. 102(a)(8)), which requires the BLM to protect the quality of scenic values on public lands.

Visual Resource Inventory

The visual resource inventory (VRI) process, described in Manual H-8410-1 (BLM 1986a), is a systematic process for determining visual values on BLM-administered land. The inventory consists of a scenic quality evaluation, sensitivity level analysis, and a delineation of distance zones. Scenic quality evaluation provides a rating of the visual or scenic appeal of differing areas in the inventory area based on the landscape physiographic characteristics., Scenic quality rating is based on the scenic quality of the vegetation, landform, water, color, adjacent scenery, scarcity and cultural modification of the landscape. Sensitivity level analysis assesses the varying levels of the public's concern for changes to the scenic quality (EPG 2016). Distance zone delineation focuses on delineating the relative visibility of the landscape within the inventory area from sensitive viewer platforms (point such as a scenic overlook, or route such as a highway or trail). These distance zones are (BLM 1986a):

- Foreground-middleground: 0 to 5 miles from viewing platform
- Background: 5 to 15 miles from viewing platform
- Seldom seen: 15 miles or beyond, or areas not visible due to topography from viewing platform.

Based on these three VRI factors, BLM-administered lands are placed into one of four VRI classes:

- VRI Class I areas are assigned based on existing management direction rather than derived through inventory. BLM policy requires that VRI Class I be assigned to areas where a management decision independent of the BLM's land use planning process and by the President, Congress, or the Secretary of the Interior directs the BLM to preserve or maintain a natural landscape. This includes areas such as WAs, WSAs, and other congressionally and administratively designated areas

- VRI Classes II–IV are derived through the inventory process. Based on observation and analysis, every square foot of BLM-administered land is given a score for the three inventory factors. VRI Classes II–IV represent the relative value of the visual resource, with Class II areas having the highest scenic value found through inventory and Class IV having lesser scenic value (BLM 1986a).

Visual Resource Management (VRM)
The BLM has developed a VRM analytical process that identifies, sets, and meets objectives for maintaining scenic values and visual quality.

Once an inventory of BLM-administered land is completed, the BLM assigns VRM class objectives to these lands through the land use planning process. VRM class objectives are binding land use plan decisions. The VRM class objectives are as follows:

- **Class I**: To preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
- **Class II**: To retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
- **Class III**: To partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the landscape.
- **Class IV:** To provide for management activities, which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of the activities through careful location, minimal disturbance, and repeating the basic elements of the landscape (BLM 1986a)

Visual Contrast Rating
Visual Contrast Rating is the process of determining whether or not a proposed action will be in conformance to the designated VRM class objective. An interdisciplinary team conducts an evaluation as described in Manual H-8431-1 (BLM 1986b). The degree to which a proposed action will affect the visual quality of a landscape depends on the visual contrast created between a project and the existing landscape. The basic design elements of form, line, color, and texture are used to make this comparison. Once the comparison between the proposed action and existing landscape is completed, corrective design features and mitigation measures are recommended in order to reduce the contrast created by the proposed action.

Yuma Resource Management Plan
Management Action VR-010 states, "All ROW corridors and communications sites are designated as VRM Class III; and Class IV where the corridor crosses areas designated VRM Class IV." (BLM 2010b)

Reclamation

Reclamation does not provide any management objectives related to visual resources.

USFWS

The US DOI, USFWS – Kofa National Wildlife Refuge and Wilderness and New Water Mountains Wilderness Interagency Management Plan and EA (BLM, USFWS, and AGFD 1996) provides a set of long-term management guidance and goals for the refuge. The following objectives relate to visual resources and maintaining the wilderness character of Kofa NWR.

- Maintain or enhance the wilderness values of naturalness, outstanding opportunities for solitude and primitive recreation, and special features.
- Minimize impacts of recreational use and visual impacts of authorized developments.
- Minimize visual impacts from mining scars and former vehicle routes.
- Evaluate options to install buried water systems instead of aboveground water storage facilities to improve visual characteristics.
- Purchase from willing sellers, private inholdings within the Kofa NWR to provide for the protection of wildlife habitat and visual values.
- Maintain air quality standards to provide for enhanced visitor experience.
- Enforce a 25 mile per hour speed limit on all refuge-maintained roads to reduce the number of dust particulates in the air.

3.18.1.2 State

Regulations and policies related to the protection of visual resources for Arizona and California are presented in the following sections.

Arizona

The Arizona Department of Transportation Scenic Roads Program (ADOT 2016c) does not contain any applicable visual policies or regulations that would pertain to the Project Area, because none of the roads in or near the Project Area are classified as designated or eligible scenic roads.

California

The California Scenic Highway Program does not contain any applicable visual resource policies or regulations that would pertain to the Project Area, because none of the roads in or near the Project Area are classified as designated state scenic highways.

CEQA (California Public Resources Code §§ 21000–21189) has an aesthetics checklist for thresholds of significance for a project, from Appendix G in CEQA. The checklist ranges from "no impact" to "potentially significant impact." CEQA guidance is as follows:

I. AESTHETICS – Would the project:
a) Have a substantial adverse effect on a scenic vista?
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcropping, and historic buildings within a state scenic highway.
c) Substantially degrade the existing visual character or quality of the site and its surroundings?
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area. (CEQA 1970)

3.18.1.3 Local

County, city, and town general and comprehensive plans along the Proposed Action and alternative segments may or may not contain policies related to the protection of visual resources pertaining to the Project.

Maricopa County

The Maricopa County Comprehensive Plan: Vision 2030 (Maricopa County 2016) does not contain any applicable visual resources policies or regulations pertaining to the Project.

The Tonopah/Arlington Area Plan (Maricopa County 2000) does not contain any applicable visual resources policies or regulations pertaining to the Project.

La Paz County

The La Paz County Comprehensive Plan (La Paz County 2005) contains one policy pertaining to visual resources in and near the Project Area. Policy 2.10 (page 25) states, "Determining ways to minimize the visual impact of the built environment on desert vistas and mountain views will be part of the evaluation process for proposed new development."

Riverside County

Plans reviewed include the Riverside General Plan (Riverside County 2015d, 2015e, 2015f) and the Palo Verde Valley Area Plan (Riverside County 2014b). These documents contain relevant visual resources policies that may pertain to the Project. They are as follows:

- The Palo Verde Valley Area Plan (Riverside County 2014b) describes two visual points addressed in the Project Area: The Colorado River and highways.
    - Policy PVVAP 1.3: "All proposed developments in this area requiring CEQA (California Environmental Quality Act) analysis shall be reviewed for compatibility with the City of Blythe Colorado River Corridor Plan, or, in the absence of such Plan, City of Blythe Standards for development along the Colorado River."
    - Policy PVVAP 10.1: "Protect the scenic highways in the Palo Verde Valley planning area from change that would diminish the aesthetic value of adjacent properties in accordance with the Scenic Corridors sections of the General Plan Land Use, Multipurpose Open Space, and Circulation Elements." This is for highways that have been nominated to be classified as scenic highways: I-10 and Highway 95 are county-eligible.

- Chapter 3: Land Use Element (Riverside County 2015d)
  - Policy LU 14.1: "Preserve and protect outstanding scenic vistas and visual features for the enjoyment of the traveling public. (AI 32)"
  - Policy LU 14.2: "Ensure that the design and appearance of new landscaping, structures, equipment, signs, or grading within Designated and Eligible State and County scenic highway corridors are compatible with the surrounding scenic setting or environment. (AI 3, 32, 39)"
- Chapter 4: Circulation Element (Riverside County 2015e)
  - Policy C 19.1: "Preserve scenic routes that have exceptional or unique visual features in accordance with Caltrans' Scenic Highways Plan. (AI 79)"
- Chapter 5: Multipurpose Open Space Element (Riverside County 2015f)
  - Policy OS 21.1: "Identify and conserve the skylines, view corridors, and outstanding scenic vistas within Riverside County. (AI 79)"
  - Policy OS 22.4: Impose conditions on development within scenic highway corridors requiring dedication of scenic easements consistent with the Scenic Highways Plan (including along Official Scenic Routes, State and county eligible and designated scenic highways), when it is necessary to preserve unique or special visual features. (AI 3)"

<u>**City of Blythe**</u>

The City of Blythe's development standards and zoning ordinances do not provide any applicable visual resource guidance or policies pertaining to the Project. The City of Blythe General Plan 2025 (City of Blythe 2007a) contains the following policies that pertain to the Project Area:

- Guiding Policy (page 1-12): "Preserve and enhance riparian corridors adjacent to the Colorado River as open space corridors for their visual amenity, drainage, fisheries, wildlife habitats, flood control, and water quality value."
- Guiding Policy: New Residential Neighborhoods Policy 34 (page 2-22): "Encourage the visual enhancement of utility services. Utility services are often located and installed in a manner that negatively detracts from the neighborhood's appearance. Such facilities should be sited so as to minimize their detraction from the built environment."
- Guiding Policy: Open Space Policy 3 (page 6-3): "Maintain existing views of the Mesa and Colorado River from roadways and public uses and other rights-of-ways on the valley floor whenever feasible."

The City of Blythe Colorado River Corridor Plan (City of Blythe 2007b) contains the following as part of the Community Form and Design values and goals (page 27):

> Preserve scenic views and ensure that development of the Colorado River Parkway is consistent with the policies contained within the Open Space and Conservation Element of General Plan 2025.

Town of Quartzsite

The Town of Quartzsite General Plan (Town of Quartzsite 2014) does not contain any applicable visual resources policies or regulations pertaining to the Project.

3.18.2 Study Area

The visual resources study area encompasses the Proposed Action and alternative segments that would connect the Delaney Substation near Tonopah, Arizona, with the Colorado River Substation west of Blythe, California. This study area includes an area 5 miles from the centerline of each Proposed Action and Alternative segment to cover an area 10 miles wide around each potential route.

The landscape in the visual resources study area is generally characterized by flat desert bounded by high-relief mountains in different distance zones. The topography of the study area ranges from relatively flat valleys to steeply sloping mountain ranges. Elevations in the valley bottoms range from about 300 to 1,200 feet, decreasing from east to west. Terrain in this part of the Project Area in California is flat and elevations range from about 250 to 2,500 feet. Mountains in the surrounding areas range in elevation between approximately 3,000 and 5,600 feet (BLM 2014c; Summit Post 2010, 2015; Trails 2016; Wilderness 2016d). Vegetation in the visual resource study area consists of Sonoran Desert communities, which are typical of the region. Flowing water features in the study area consist of irrigation ditches, the CAP canal, and the Colorado River.

Development in the visual resources study area is moderate and consists of utility development such as monopole and H-frame structures; lattice structures; Delaney and Colorado River substations; and dirt and paved roads including I-10, Highway 95 in Arizona, and Highway 95 in California; the towns of Tonopah, Quartzsite, Ehrenberg, Arizona and Ripley, California; the City of Blythe, California; and the Blythe Airport.

3.18.2.1 KOP Identification and Selection

Measuring or rating the degree of contrast is done from the selected critical viewpoints or Key Observation Points (KOPs). KOPs are stationary points, or linear travel routes that are used to describe impacts to visual resources. KOPs typically are areas that have a public sensitivity (scenic vista, scenic highway, recreational trail, etc.).

The study team considered multiple sources of information regarding public sensitivity to the Project Area and performed field reconnaissance in the process of identification and selection locations for KOPs. Additionally, the study team considered the following 10 environmental factors:

- Distance. The contrast created by a project usually is less as viewing distance increases.
- Angle of Observation. The apparent size of a project is directly related to the angle between the viewer's line-of-sight and the slope upon which the project is to take place. As this angle nears 90 degrees (vertical and horizontal), the maximum area is viewable.

- Length of Time the Project is in View. If the viewer has only a brief glimpse of the project, the contrast may not be of great concern. If, however, the project is subject to view for a long period, as from an overlook, the contrast may be very significant.
- Relative Size or Scale. The contrast created by the project is directly related to its size and scale as compared to the surroundings in which it is place.
- Season of Use. Contrast ratings should consider the physical conditions that exist during the heaviest or most critical visitor use season, such as snow cover and tree defoliation during the winter, leaf color in the fall, and lush vegetation and flowering in the spring.
- Light Conditions. The amount of contrast can be substantially affected by the light conditions. The direction and angle of lighting can affect color intensity, reflection, shadow, from, texture, and many other visual aspects of the landscape. Light conditions during heavy periods must be a consideration in contrast ratings.
- Recovery Time. The amount of time required for successful revegetation should be considered. Few projects meet the VRM management objectives during construction activities. Recovery usually takes several years and goes through several phrases (e.g., bare ground to grasses, to shrubs, to trees, etc.). It may be necessary to conduct contrast ratings for each of the phases that extend over long time periods. Those conducting contrast rating should verify the probability and timing of vegetative recovery.
- Spatial Relationships. The spatial relationship within a landscape is a major factor in determining the degree of contrast. Spatial position (the elevation and location of the objects in the landscape relative to topography), backdrop (topography against which an object is seen), observer position (inferior, normal, or superior), and distance define the spatial relationships in a view, and affect the impact of a change in the landscape.
- Atmospheric Conditions. The visibility of projects due to atmospheric conditions such as air pollution or natural haze should be considered.
- Motion. Movement such as waterfalls, vehicles, or plumes draws attention to a project.

Field reconnaissance was used by the study team to identify locations of sensitive viewers (such as businesses and residences). KOPs were selected for analysis to represent a broad range of viewer perspectives, capture views of segments carried forward for detailed analysis, and locations that were thought to inform the need for an RMP amendment to revise VRM classes.

As part of developing the description of the existing visual resources in the Project Area, basic design elements of form, line, color, and texture were used to describe the four elements of the characteristic landscape: landform, water, vegetation, and structures (see BLM Manual 8431, Visual Resource Contrast Rating; BLM 1986b and the Visual Contrast Rating Worksheets for each KOP located in Appendix 3C).

3.18.2.2 VRI

VRI classes have been defined for BLM-administered land under the Hassayampa, Palm Springs, and Yuma Field Offices. VRI classes are unavailable for BLM-administered land under the Lake Havasu and Lower Sonoran Field Offices. The data collected on scenic quality, viewer sensitivity, distance zones, and VRI classifications describe much of the study area in both Arizona and California and aided in describing the environment around the KOPs.

3.18.3 Existing Conditions

The Project Area consists of Sonoran Desert vegetation communities that include species such as creosote, desert ironwood, palo verde, and varieties of cacti. The Project passes through open desert, urban areas, agricultural fields, and desert mountains and valleys. The Project Area is located near several WAs with scenic mountainous terrain visible in the study area, including the Big Horn Mountains WA, the Eagletail Mountains WA, the new Water Mountains WA, and the Kofa WA. In addition, the Proposed Action passes through the northern portion of the Kofa NWR, passes adjacent to the northeastern corner of the YPG, and passes near or through several popular recreation areas.

Mountains frame the study area and include Harquahala Mountain to the north of the first Proposed Action segment (Segment p-01) and Saddle Mountain located just south of the Delaney Substation. Harquahala Mountain is the tallest mountain visible—at over 5,600 feet in elevation (BLM 2014c)—and is in the seldom-seen distance from all primary travel routes. Saddle Mountain is in the foreground-middleground to background distances for the start of the Proposed Action and Alternative segments near Delaney Substation (Segments p-01 and d-01).

The characteristic landscape in the study area consists of desert vegetation and major cultural modifications such as the towns of Tonopah and Quartzsite and the city of Blythe; surrounding agricultural land; existing transmission and distribution lines; and major roadways that include I-10, SR 95 in Arizona, and US 95 in California. The vegetation and soil colors represented in the undeveloped landscape consist of earth tones: browns, tans, grays, and greens.

The Proposed Action and Alternative segments would be visible from several areas, including I-10, state highways, local roads, residential developments, and recreational areas. The Town of Quartzsite hosts a large gem and mineral show every year in January and February, which draws in excess of 1 million people through the area who would see the Project features. Some of the closest residences to the routes in the study area are houses in Blythe, RVs in McIntyre County Park, and Snow Bird West RV Park.

Some of the major features in or near the study area (such as prominent landscape features, major tourist attractions/outdoor recreation areas, and important utilities, etc.) include the Kofa NWR southeast of Quartzsite; YPG south of Copper Bottom Pass; the Colorado River Indian Reservation; Eagletail WA; CAP canal; and the Colorado River. Many recreationalists use the Copper Bottom Area located southwest of Quartzsite. Johnson Canyon is one of the most visited areas within the Copper Bottom Area, with several OHV trails open for use. The proposed Arizona Peace Trail winds through the study area, generally trending north-south, and follows or is in close proximity to several Proposed Action and Alternative segments in the Copper Bottom area.

3.18.3.1 Visual Resource Inventory

The VRI for the BLM YFO (EPG 2016), and the Palm Springs Field Office included areas where the Project is located within the boundaries of the YFO and Palm Springs Field Office, respectively. VRI classes were assigned to these areas based on factors of scenic quality, sensitivity level, and distance zones. These classes are shown in Figure 3.18-1 (Appendix 1). Lands are classified from Class I through Class IV, with Class I representing the highest scenic value and Class IV representing the lowest scenic value. Scenic quality, shown in Figure 3.18-2 (Appendix 1), is rated from A to C, with an A rating having the highest value of scenic quality and C having the lowest value. Viewer sensitivity, shown in Figure 3.18-3 (Appendix 1), is rated from high to low. Distance zones defined in Section 3.18.1.1 are shown in Figure 3.18-4 (Appendix 1). These figures are from the VRI analysis, with the Proposed Action and Alternative segments added to show how portions of the study area would be classified.

As described in Section 3.18.1.1, the BLM uses the VRI system to describe and classify the existing scenic values for BLM-administered land. Therefore, no VRI information or classifications are available for private lands or other non-BLM-administered land.

Many areas that are important visual features are also important recreational areas. These important recreational areas overlap with visual resources; however, the Recreation Baseline Technical Report (HDR 2017e) addresses the recreational aspect of the Project.

3.18.3.2 Visual Resource Management Objectives

The VRM Classes for each segment are provided in figures and summary tables in the introduction for each zone in the following sections.

3.18.3.3 KOP Overview

Table 3.18-1 provides an overview of the KOPs that the study team examined for the Project.

Table 3.18-1 KOPS, Segments, and Applicable Planning Area(s) by Zone

KOP	KOP NAME	SEGMENTS VIEWED	APPLICABLE PLANNING AREA(S)
	East Plains and Kofa Zone		
1	Saddle Mountain Trailhead	p-01, d-01	Maricopa County, La Paz County, Tonopah/Arlington Area Plan
2	Salome Road South	p-01, d-01	Maricopa County, La Paz County, Tonopah/Arlington Area Plan
3	I-10 Crossing East	p-01	Maricopa County, La Paz County, Tonopah/Arlington Area Plan
5	Private Residence	d-01	Maricopa County, La Paz County, Tonopah/Arlington Area Plan
6	Salome Road North	p-01	Maricopa County, La Paz County, Tonopah/Arlington Area Plan
7	Snowbird West RV Park	p-01	Maricopa County, La Paz County, Tonopah/Arlington Area Plan
8	I-10 Crossing West	p-01, p-02, p-03, i-01, x-01, x-02	Maricopa County, La Paz County, Tonopah/Arlington Area Plan
9	Eagletail Mountains (Courthouse Rock)	d-01	Maricopa County, La Paz County, Tonopah/Arlington Area Plan
10	Palomas – Harquahala Road	p-04, p-05, x-03	La Paz County

KOP	KOP NAME	SEGMENTS VIEWED	APPLICABLE PLANNING AREA(S)
11	Intersection of AT&T and Connector Road	x-03, i-02	La Paz County
12	Hovatter Road	x-04	La Paz County
59	I-10 West Crossing Eastbound	i-01, i-02, i-03, x-03, x-01, p-02, p-03, p-04	La Paz County
60	I-10 Eastbound On-ramp at Hovatter Road	i-03, i-04, x-04, in-01	La Paz County
62	I-10 Westbound South of Brenda	Alt SCS	La Paz County
63	I-10 Eastbound South of Brenda	Alt SCS	La Paz County
Quartzsite Zone			
13	Kofa Wayside/Vicksburg Road	p-06	La Paz County
14	Kofa #1	p-06	La Paz County
15a	Kofa #2 – Wilbanks Road	p-06	La Paz County
15b	Kofa East Pinch Point	p-06	La Paz County
16	Kofa #3	p-06	La Paz County
17	I-10 Rest Area East	i-03, x-04	La Paz County
18	I-10 Westbound	i-03, x-04	La Paz County
19	Brenda RV Park	i-04, in-01	La Paz County
20	Gold Nugget Road	i-04, in-01	La Paz County
21	Mitchell Mine Road Residence	x-05	La Paz County
22	BLM LTVA #1	x-06, x-05	La Paz County, Town of Quartzsite
23	BLM LTVA #2	x-06, x-05, x-07	La Paz County, Town of Quartzsite
24	RV Park Quartzsite	qs-01	Town of Quartzsite
26	Quartzsite Civic Event Parcel	qs-02	La Paz County, Town of Quartzsite
27	Boyer Road – Quartzsite North Side	qn-02	La Paz County, Town of Quartzsite
28	Highway 95 LTVA	x-07	La Paz County, Town of Quartzsite
29	Highway 95 Crossing	x-06, x-05, p-07, p-08, p-09	La Paz County, Town of Quartzsite
61	I-10 Eastbound West of Quartzsite	Qs-01, qs-02, i-06, qn-02, x-07	La Paz County, Town of Quartzsite
Copper Bottom Zone			
30	Copper Bottom Pass Road #1	p-09, p-10	La Paz County
32	Copper Canyon	p-10	La Paz County
33	Johnson Canyon	cb-02	La Paz County
34	Copper Bottom Alternatives Intersection	cb-01, cb-02, cb-04	La Paz County
35	Copper Bottom Pass Road #2	p-11, cb-03	La Paz County
36	Dome Rock Mountains	cb-04, cb-06	La Paz County

KOP	KOP NAME	SEGMENTS VIEWED	APPLICABLE PLANNING AREA(S)
37	Ehrenberg-Cibola Road	p-13, cb-05	La Paz County
38	Ehrenberg Wash	p-12, cb-06, cb-05	La Paz County
39	I-10 Hilltop	i-06	La Paz County
40	I-10 Rest Area West	i-07, p-13	La Paz County
Colorado River and California Zone			
41	Colorado River Crossing	i-08s, ca-04	N/A
42	Colorado River Corridor	x-10, x-11	La Paz County, Palo Verde Valley Area Plan, City of Blythe, Colorado River Corridor Plan
43	Riviera Drive, West Side of Colorado River	x-10, ca-01	La Paz County, Palo Verde Valley Area Plan, City of Blythe, Colorado River Corridor Plan
44	Oxbow Road Colorado River Crossing	cb-10, x-11, p-15e/w	La Paz County, Riverside County, Palo Verde Valley Area Plan
45	McIntyre County Park	p-15e/w	La Paz County, Riverside County, Palo Verde Valley Area Plan
46	Confidential		
47	Appleby Elementary School	ca-05, ca-01	Riverside County, Palo Verde Valley Area Plan, City of Blythe
48	Miller Park	ca-05, ca-01	Riverside County, Palo Verde Valley Area Plan, City of Blythe
49	Intersection of Seeley and Lovekin	ca-05, ca-06, ca-01, p-15	Riverside County, Palo Verde Valley Area Plan, City of Blythe
50	18th Avenue Houses	p-15w, ca-01, ca-05	Riverside County, Palo Verde Valley Area Plan
51	Lovekin Private Residence	p-15w, ca-01	Riverside County, Palo Verde Valley Area Plan, City of Blythe
52	Intersection of I-10 and Neighbours Boulevard	ca-05, ca-06, ca-01, p-15, p-16	Riverside County, Palo Verde Valley Area Plan
53	Ripley	p-15, p-16, x-12, x-13	Riverside County, Palo Verde Valley Area Plan
54	Mesa Verde Community	ca-07	Riverside County, Palo Verde Valley Area Plan
55	I-10 Communication Site	ca-09, p-17	Riverside County, Palo Verde Valley Area Plan
56	I-10 North of Colorado River Substation	ca-09, p-18	La Paz County, Riverside County, Palo Verde Valley Area Plan
57	Confidential		

Notes: I-10 = Interstate 10, KOP = key observation point, LTVA = long-term visitor area, RV = recreational vehicle

Each of the KOPs is described in detail in the following sections according to the Proposed Action by zone. Visual Contrast Rating Forms have been completed through Section B (Characteristic Landscape Description) for each KOP and are provided in Appendix 3C.

Information for confidential sites is contained in a limited distribution Confidential Appendix 3D.

3.18.3.4 East Plains and Kofa Zone

Zone Overview

The East Plains and Kofa Zone is distinguished by a broad desert plain rimmed with rugged angular mountains. Mountain features within three WAs are visible from the East Plains and Kofa Zone: Big Horn Mountains WA, Eagletail Mountains WA, and New Water Mountains WA. Additionally, a portion of the Kofa NWR lies in this zone and is intersected by a segment of the Proposed Action. Vegetation at the lowest elevations of the desert plain tends to be sparse and fairly uniform in vegetation type, contributing to low visual interest. As elevation increases, the diversity of the vegetation community increases, with saguaros, ocotillos, chollas, and other cacti interspersed with other vegetation, thus increasing the diversity and visual interest. Portions of the desert plain are irrigated and converted to agricultural land, appearing rural and pastoral. I-10 runs east and west across the northern portion of the study area, while numerous two-track, gravel, and hardened surface local routes crisscross the plain. I-10 offers distant scenic views of the mountain ranges rimming the plain. The area is dotted with a few residences and agricultural operations, and a few businesses are located at or near I-10 exits. The main development in the zone is the Delaney Substation, the DPV1 transmission line, and a power plant with monopole transmission lines connecting to the substation. The largest number of sensitive viewers in the zone are travelers on I-10, along with travelers on local routes, recreationists, and the few residents of this sparsely populated area.

The majority of the Proposed Action segments in the East Plains and Kofa Zone run through VRI Class IV lands with a few segments (Segment p-04 and some of p-05) passing through the Class II and III lands on the northwestern corner of the Eagletail Mountains WA (Appendix 1, Figure 3.18-1). Scenic quality (Appendix 1, Figure 3.18-2) in this portion of the Proposed Action is rated as C, with small portions (Segment p-04 and some of p-05) of the Proposed Action running through an A-rated area near the Eagletail Mountains WA. In addition, this portion of the Proposed Action has a mix of high sensitivity (Segments p-04 and p-05), medium sensitivity (Segment p-03), and low sensitivity (Segment p-05 and part of p-06) (Appendix 1, Figure 3.18-3). The Proposed Action segments in the East Plains and Kofa Zone are within the foreground-middleground distance zone. This portion of the Proposed Action crosses VRM Class III (parts of Segment p-01, part of Segment p-05, and the section of Segment p-06 not traveling through Kofa NWR) and some areas of VRM Class II (Segments p-03, p-04, and some of p-05) (Appendix 1, Figure 3.18-5). Most of the Proposed Action in this zone runs along a BLM-designated utility corridor; the only exception to this is the western half of Segment p-01.

The majority of the area containing the Alternative segments in this zone has a VRI classification of Class IV, with areas north of the New Water Mountains WA classified as VRI Class II and III (part of Segments i-03, x-04, in-01, and i-04), and areas around Quartzsite classified as almost entirely Class III (Segments i-05 and x-05) (Appendix 1, Figure 3.18-4). Scenic quality (Appendix 1, Figure 3.18-2) around the Alternative segments is rated almost entirely as C, with a few smaller areas rated B (parts of Segments i-03, x-04, i-04, and x-05) and A (part of Segment x-03). Sensitivity (Appendix 1, Figure 3.18-3) is high for the Alternative Segments in-01, i-04, i-05, and x-05, and for small portions of other segments (x-03 and x-04). Alternative Segment x-04 is a mixed area of low or moderate viewer sensitivity. The remainder of the Alternative segments have a moderate viewer sensitivity. VRM classification (Appendix 1, Figure 3.18-5) for these Alternative segments is mostly Class III, with a few areas of Class II (most of Segment d-01, parts of Segments x-01, x-02, x-03, x-05, and in-01) and some Class IV (part of Segment in-01). Segment d-01 goes through more VRM Class II land than any other Alternative segment. The Alternative segments that pass adjacent to I-10 run along the BLM-designated WWECs 30-52.

The Alternative SCS would be located south of I-10 near the junction of Segments i-03, i-04, and x-04 (Appendix 1, Figure 3.18-5) in an area within a BLM utility corridor where views are in the foreground-middleground, with high viewer sensitivity, and an area with Scenic Quality B, and both VRI and VRM Class III (Appendix 1, Figures 3.18-1 and 3.18-5). Two different possible locations for the Alternative SCS are a few hundred feet apart, to allow for different routing options.

All segments within the East Plains and Kofa Zone would be in the foreground-middleground distance zone. Table 3.18-2 summarizes segment information for the East Plains and Kofa Zone.

Table 3.18-2 Segment Summary for the East Plains and Kofa Zone

SEGMENT	SCENIC QUALITY	SENSITIVITY	DISTANCE ZONE	VRI CLASS	VRM CLASS
PROPOSED ACTION					
p-01	B	Moderate, Low, and High	Foreground-middleground	II / IV	III
p-02	N/A	N/A	N/A	N/A	N/A
p-03	C	Moderate	Foreground-middleground	IV	III
p-04	C	Moderate and High	Foreground-middleground	III, IV	III
p-05	A	High and Low	Foreground-middleground	II, III	III
p-06	C	Low	Foreground-middleground	III, IV	III
ALTERNATIVE SEGMENTS					
d-01	C	Moderate	Foreground-middleground	IV / IV	III
i-01	C	Moderate	Foreground-middleground	IV	III
i-02	C	Moderate	Foreground-middleground	IV	III
i-03	C and B	Moderate	Foreground-middleground	III, IV	III
i-04	B and C	High	Foreground-middleground, seldom seen	II, III	III
in-01	C and B	High	Foreground-middleground	II, III	III
x-01	C	Moderate	Foreground-middleground	IV	II and III

SEGMENT	SCENIC QUALITY	SENSITIVITY	DISTANCE ZONE	VRI CLASS	VRM CLASS
x-02	C	Moderate	Foreground-middleground	IV	II and III
x-03	C	Moderate and High	Foreground-middleground	III, IV	III
x-04	C	Moderate and Low	Foreground-middleground	IV	III

[a] Segment d-01 falls within the Yuma planning area and the Lower Sonoran planning area. Values for VRI and VRM classes are presented as follows: "Yuma class / Lower Sonoran class." Scenic quality and visual sensitivity values were only available for the Yuma planning area.

Scenic Quality categories: A = High, B = Medium, C = Low

VRI classes: I = areas where the current management situation requires maintaining a natural environment essentially unaltered by man, II/III/IV = based on combinations of scenic quality, sensitivity levels, and distance zones as displayed in Table 3.18-2.

VRM classes: I = Objective is to preserve the existing character of the landscape. Provides for natural ecological changes; but does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

II = Objective is to retain the existing character of the landscape. Level of change to the characteristic landscape should be low. Management activities may be seen but should not attract attention of the casual observer. Changes must repeat the basic elements found in the predominant natural features of the characteristic landscape.

III = Objective is to partially retain existing character of the landscape. Level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

IV = Objective is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. Any action necessary to prevent unnecessary and undue degradation to the land is to be taken, such as, but not limited to, careful location, minimal disturbance, and repeating the basic elements.

Notes: If more than one value applies to a segment, both values are provided showing the value with the highest proportion of the segment first.

N/A indicates that the segment does not lie on BLM land or that a value was not applied to that segment by the BLM.

Sources of nighttime light and glare in this zone include the Delaney Substation, the existing DPV1 line with its FAA-required safety lights, infrequent lights from residences and agricultural operations, and the lights from vehicles along I-10.

KOP 1 – Saddle Mountain Trailhead

KOP 1 (Appendix 1, Figure 3.18-6) is located on BLM-administered land south of the Delaney Substation and southwest of Tonopah, Arizona. The KOP represents the views of hikers, OHVs, and other recreationists in the Saddle Mountain area, looking north at the Delaney Substation and Segments p-01 and d-01 on private land. The view from KOP 1 is open and panoramic. Viewers are looking at desert with tan, dark brown, and black pyramidal landforms rising from the plain in the foreground and faint distant angular mountains at the horizon in the background. Lines in the view are predominantly horizontal, with soft striations in the soil colors and textures in the immediate foreground, and soft horizontal lines in the colors of vegetation in the foreground--

middleground. Landforms create rough and jagged horizontal lines at the horizon. Exposed land is rocky and coarse in the immediate foreground, to stippled and smooth in the distant foreground-middleground. Dark green to gray-green vegetation is sparse and wispy in the immediate foreground, punctuated by columnar and spiky saguaros, and becoming uniform and indistinct in the distance. Flat agricultural lands to the northwest appear as variegated tans and greens. Both the Delaney Substation and a power plant to the west of the substation are visible, appearing rectangular, geometric, and white to gray. Nearby lattice structures are faintly visible with complex vertical lines and monopoles are visible as soft short vertical white lines. Agricultural buildings in the area appear as white dots in the landscape.

KOP 2 – Salome Road South

KOP 2 (Appendix 1, Figures 3.18-7a and b) is located on Salome Road south of I-10 and north of the Delaney Substation, Arizona. The KOP represents the views of south bound travelers on Salome Road looking east-southeast at Segment p-01 or south-southwest at Segment d-01, both of which would be on a combination of state trust and private land. Salome Road is a wide, well-maintained gravel road that would allow for vehicles to travel at higher speeds. The view from KOP 2 is open and panoramic. Viewers are looking at flat desert that slowly rises to dark brown angular jagged mountains at the horizon in the middleground. A green horizontal line is created where the uniform native vegetation is at the horizon or base of the distant mountains. The mountains in the middleground create a strong undulating to jagged horizontal line at the horizon. Exposed land is shades of tan, brown, and gray-brown, stippled in the foreground, becoming smooth in the distance. Yellow-green to gray-green vegetation is sparse, rounded, and wispy, becoming uniform and indistinct in the distance. Salome Road is flat and slowly rising in elevation in the distance, light reddish tan, with a gravel surface that appears stippled to smooth. The Delaney Substation, existing lattice structures, monopoles, and transmission lines are visible in the distance of the middleground with rectilinear geometric shapes that are spiky on top, and smooth, undulating transmission lines that fade into the distance. The substation appears white or light gray, contrasting with the backdrop of dark mountains, and focusing the attention of the viewer.

KOP 3 – I-10 Crossing East

KOP 3 (Appendix 1, Figure 3.18-8) is located on westbound I-10 west of Tonopah, Arizona looking west at the easternmost I-10 crossing of the existing DPV1 transmission line, and represents the views of westbound traffic on I-10 traveling at highway speeds. Viewers would be looking west at Segment p-01 paralleling the existing DPV1 line on private and state trust land on either side of I-10. From KOP 3 the view is open and panoramic. A large dark brown rugged domed mountain with nearby smaller rocky hills is the focus of the view. Distant rugged mountains are visible at the horizon in the background. The surrounding desert is sparsely vegetated with wispy yellow-green shrubs that become lumpy to uniform in the distance. A broken horizontal line is clearly visible in the landscape where the flat light tan desert plain meets the mountains in the middleground. The distant mountains create a jagged horizontal line at the skyline. The divided highway is flat gray with irregular darker gray lines, and linear white and yellow lines, which creates an overall strong diagonal line in the landscape. The barbed wire fence alongside the highway is visible with short vertical red and white fence posts and faintly visible wire strands and is partially obscured by vegetation. The existing DPV1 transmission line is visible with lattice structures that are visible as dark gray complex and spiky geometric and rectilinear lines. The transmission line itself is faintly visible in places as soft horizontal curvilinear lines.

KOP 5 – Private Residence

KOP 5 (Appendix 1, Figure 3.18-9) is located on private property in an agricultural area south of I-10 and approximately 7 miles west of Tonopah, Arizona. The KOP represents the views of residents looking south who would be viewing segment d-01 on private land. The view from KOP 5 is open and panoramic but begins to be enclosed to the southwest. Viewers are looking at expansive, flat agricultural fields east of N 515th Avenue/Steve Martori Drive and native vegetation west of the road, with a rugged mountainous background. A strong horizontal line is created where the bright green of the agricultural fields meets a tan band of native vegetation and the base of the blue-gray mountains in the distance. Native vegetation to the southwest and the tan banding of exposed soils create a subtler horizontal line, while the rugged mountains in the background create a jagged and broken irregular horizontal line at the skyline. The series of single wood power poles create a series of repeated strong vertical lines that fade into the distance. The associated power lines are faintly visible as diagonal and undulating. Agricultural buildings and tarp-covered stacks of hay are dotted white, tan, and black geometric elements, further emphasizing the horizontal line at the base of the mountains.

KOP 6 – Salome Road North

KOP 6 (Appendix 1, Figure 3.18-10) is located within the ROW for Salome Road north of I-10 and west of Tonopah, Arizona. The KOP represents the views of southbound travelers on Salome Road looking southeast at Segment p-01 on a combination of private and state trust land. The view from KOP 6 is open and panoramic. Viewers are looking at desert undulating with ephemeral washes, with distant angular jagged mountains in the background. A strong green horizontal line is created where the uniform native vegetation is at the horizon or base of the distant and sometimes faintly visible jagged mountains. Landforms create additional soft horizontal lines and overall undulation in the landscape. Exposed earth is shades of tan, brown, and gray-brown, stippled in the foreground, becoming smooth in the distance. Dark green to gray-green vegetation is sparse, rounded, and lumpy, becoming uniform and indistinct in the distance. Salome Road is flat and undulating with yellow and white lines. The existing DPV1 lattice structures and transmission lines run roughly perpendicular to the road with rectilinear geometric shapes that are spiky on top, and smooth, undulating transmission lines that fade into the distance.

KOP 7 – Snowbird West RV Park

KOP 7 (Appendix 1, Figure 3.18-11) is located on private property just south of the Snowbird West RV Park, north of I-10. The KOP represents the views of visitors/residents of the RV park from the southern edges of the development looking south at Segment p-01 on private land. The view from KOP 7 is open and panoramic with distant views of the Saddle Mountain and Courthouse Rock features. Viewers are looking at desert with distant angular jagged mountains in the background. A drab, yellow-orangish-green horizontal line is created where the uniform native vegetation meets the skyline and base of the distant mountains. The profile of the blue-gray mountains creates a broken and jagged horizontal line. Patterns of finely textured shades of red-tan in the exposed earth in the foreground create soft horizontal lines. Dark green to yellow-green vegetation in the immediate foreground is sparse and hummocky, wiry becoming rounded to uniform in the distance. The existing DPV1 lattice structures are visible at the horizon and foot of the distant mountains, with faintly visible undulating horizontal transmission lines. Because of the distance, the structures appear like mostly vertical lines, with some faintly noticeable geometric lines, that are spiky on top with smooth transmission lines. The transmission infrastructure fades into the mountain backdrop looking east to west.

KOP 8 – I-10 Crossing West

KOP 8 (Appendix 1, Figure 3.18-12) is located in the median of I-10 looking west at the westernmost I-10 crossing of the existing DPV1 transmission line, and represents the views of traffic on I-10 traveling at highway speeds. Viewers would be looking west-southwest at Segments p-01 and p-02 on a combination of private and state trust land paralleling the existing DPV1 line. From KOP 8 the view is open and panoramic. Distant rugged dark brown mountains are visible at the horizon in the middleground and background. The surrounding desert is sparsely vegetated with wispy yellow-green shrubs that become lumpy to uniform in the distance. A broken horizontal line is clearly visible in the landscape where the flat vegetated desert plain in shades of green and brown meets the mountains in the middleground. The distant mountains create a jagged horizontal line at the skyline. The divided highway is flat gray, which creates an overall strong diagonal line in the immediate foreground. The existing DPV1 transmission line is visible with lattice structures that are visible as dark gray complex and spiky geometric and rectilinear lines. The transmission line itself is faintly visible as soft horizontal curvilinear lines.

KOP 9 – Eagletail Mountains – Courthouse Rock

KOP 9 (Appendix 1, Figure 3.18-13) is near the BLM Courthouse Rock trailhead, and adjacent to the Eagletail Mountains WA. The KOP represents the views of area recreationists looking north at Segment d-01, portions of which would be on private land and BLM-administered land designated VRM Class III. The portion of Segment d-01 that would be located on BLM-administered lands would be on lands that are designated as VRI Class IV, comprised of scenic quality C, moderate sensitivity, and foreground-middleground distance zone. The view from KOP 9 is partially enclosed on the eastern and western sides by tan and brown rugged low mountains, with distant views of blue-gray mountains directly north. Viewers are looking at a slightly rising ridge of desert in the immediate foreground, with a narrow band of flat desert at a lower elevation and rugged mountains in the background. A strong horizontal line is created where the narrow band of variegated tan lower elevation desert meets the base of the blue-gray mountains in the distance. The mountains create a jagged and undulating horizontal line at the horizon. The exposed earth in the immediate foreground is light tan, coarse and rocky, and becoming stippled farther from the viewpoint. Vegetation is shades of yellow-green, dark green, and gray-green, mostly clumped and wispy, and punctuated by vertical columnar yellow-green saguaros. The two-track dirt road leading into the Courthouse Rock area creates a thin diagonal to curvilinear light tan band at the base of a nearby hill.

KOP 10 – Palomas – Harquahala Road

KOP 10 (Appendix 1, Figure 3.18-14) is located on BLM-administered lands designated VRM Class II north of the Eagletail Mountains WA and south of the existing DPV1 line. The KOP represents the views of area recreationists and backroad travelers looking north at Segments p-04, p-05, and x-03. Segments p-04 and x-03 would be located on BLM-administered lands that are VRI Class III, comprised of scenic quality C with high sensitivity, within the foreground-middleground distance zone. Segment p-05 would be located on BLM-administered lands that are VRI Class II, comprised of scenic quality A, high sensitivity, and within the foreground-middleground distance zone. The view from KOP 10 is mostly open and panoramic but becoming enclosed on the eastern and western sides by tan, red, and brown rugged hills, with distant views of blue-gray mountains to the north. Viewers are looking at a gently rising flat desert plain in the foreground-middleground, with rugged mountains in the background. The exposed earth in the immediate foreground is light tan, coarse and rocky, and becoming stippled farther from the viewpoint. Vegetation is shades of yellow-green, dark green, and gray-green, mostly clumped and soft, that becomes uniform and indistinct with distance. A strong horizontal line is created where vegetation of the desert plain meets the base of the blue-gray mountains in the distance. The mountains create a jagged and undulating horizontal line at the horizon. The well-maintained dirt road creates gently curvilinear tan-red banding in the scene. The existing DPV1 transmission line is visible with lattice structures that appear dark gray, complex and spiky, geometric, and rectilinear lines. The conductor is faintly visible in places as soft horizontal curvilinear lines. Movement of vehicles on I-10 are visible in the distance as white dots moving along the highway.

KOP 11 – Intersection of AT&T and Connector Road

KOP 11 (Appendix 1, Figures 3.18-15a and b) is located on BLM-administered land designated VRM Class III between I-10 and the DPV1 line west of the westernmost crossing of I-10 and east of Segment x-03. The KOP represents the views of area recreationists and backroad travelers looking north at Segment i-02 and looking west-southwest at Segment x-03, on lands designated VRM Class III. Segment i-02 would be on BLM-administered lands that are VRI Class IV, comprised of scenic quality C and moderate sensitivity, within the foreground-middleground distance zone. Segment x-03 would be on BLM-administered lands that are VRI Classes III and IV, comprised of scenic quality C and moderate to high sensitivity, within the foreground-middleground distance zone. The view from KOP 11 is open and panoramic with views of rugged dark brown mountains in the middleground and blue-gray mountains in the distance. Viewers are looking at a light tan flat desert plain in the foreground-middleground, with rugged mountains in the middleground and background. The exposed earth in the immediate foreground is light tan and stippled. Vegetation is shades of yellow-green, dark green, and gray-green, mostly clumped and wispy, that becomes uniform and indistinct with distance. A strong horizontal line is created where vegetation of the desert plain meets the base of the mountains. The mountains create a jagged and undulating horizontal line at the horizon. The well-maintained dirt road creates gently curvilinear gray-tan banding in the scene. Monopoles supporting distribution lines appear as a series of short brown vertical lines. The line itself is faintly visible in places as soft horizontal curvilinear lines. Looking north, vehicles on I-10 are visible in the distance as white dots moving along the highway, contributing to the strong horizontal line.

KOP 12 – Hovatter Road

KOP 12 (Appendix 1, Figure 3.18-16) is located on BLM-administered lands designated VRM Class III between I-10 and the DPV1 line west of the westernmost crossing of I-10 and between Segments x-03 and x-04. The KOP represents the views of area recreationists and backroad travelers looking southwest at Segment x-04, on lands designated VRM Class III. Segment x-03 would be on BLM-administered lands that are VRI Class III and IV, comprised of scenic quality C and moderate and high sensitivity, within the foreground-middleground distance zone. Segment x-04 would be on BLM-administered lands that are VRI Class IV, comprised of scenic quality C and moderate and low sensitivity, within the foreground-middleground distance zone. The view from KOP 12 is open and panoramic with views of rugged dark brown mountains in the middleground and blue-gray mountains in the distance. Viewers are looking at a flat desert plain in the foreground-middleground, with rugged mountains in the middleground and background. The exposed earth in the immediate foreground is reddish-tan and stippled. Vegetation is shades of yellow-green, dark green, and gray-green, mostly clumped and wispy, that becomes uniform and indistinct with distance. A strong horizontal line is created where vegetation of the desert plain meets the base of the mountains, and is intermittently broken by higher vegetation along the road in the immediate foreground. The mountains create a jagged and undulating horizontal line at the horizon. The well-maintained dirt road creates diagonal red-tan banding in the scene.

KOP 13 – Kofa Wayside/Vicksburg Road

KOP 13 (Appendix 1, Figure 3.18-17) is located on USFWS-managed public lands between I-10 and the DPV1 transmission line west of Segment x-04. The KOP represents the views of area recreationists and backroad travelers visiting the Kofa wayside interpretive station, looking south-southeast at Segment p-06, on BLM-administered land designated VRM Class III. Segment p-06 would be on BLM-administered land that are VRI Class III and IV, comprised of scenic quality C and low sensitivity, within the foreground-middleground distance zone. Views may also potentially include Segment p-06 on lands within the Kofa NWR. The view from KOP 13 is open and panoramic with views of rugged dark brown mountains in the middleground. Viewers are looking at a slightly rising flat desert plain in the foreground with rugged mountains in the middleground and background. The exposed earth in the immediate foreground is light tan, rocky, and stippled. Vegetation is shades of yellow-green, dark green, and gray-green, mostly clumped and wispy, that becomes uniform and indistinct with distance. An irregular and broken horizontal line is created by vegetation of the desert plain at the skyline and base of the mountains. The mountains create a broken jagged and undulating horizontal line at the horizon. The well-maintained dirt road creates horizontal light red-tan banding in the scene.

KOP 14 – Kofa #1

KOP 14 (Appendix 1, Figure 3.18-18) is located midway within the Kofa NWR north of the DPV1 line and adjacent to the Kofa WA. The KOP represents the views of recreationists and backroad travelers within the Kofa NWR looking south-southwest at Segment p-06 on USFWS-managed public land, which would parallel the south side of the existing DPV1 line. The view from KOP 14 is mostly panoramic, with some enclosed view of gentle hills sloping down to the desert plain and rugged blue-gray mountains in the distance. Viewers are looking at a light tan and gray gently sloping and rolling desert in the foreground-middleground that gives way to flat plain dotted with hills in the middleground, with rugged mountains in the middleground and background. Vegetation appears relatively diverse compared with other areas, consisting of ocotillos, teddy bear chollas, and occasional saguaros. Vegetation is in shades of light gold, yellow-green, dark green, and gray-green, that is wiry to clumped dotted and more uniform with distance. A subtle horizontal line is created where vegetation of the desert plain meets the base of the mountains. The mountains create a jagged and undulating horizontal line at the horizon. The rough two-track dirt road creates gently curvilinear gray-tan banding in the scene. Lattice structures for the DPV1 line and a communications tower are present in the scene but barely visible and not noticeable.

KOP 15a – Kofa #2 – Wilbanks Road

KOP 15a (Appendix 1, Figure 3.18-19) is located in the eastern portion of the Kofa NWR south of the DPV1 line and adjacent to the Kofa WA. The KOP represents the views of recreationists and backroad travelers within the Kofa NWR looking north at Segment p-06 on USFWS-managed public land, which would parallel the south side of the existing DPV1 line. The view from KOP 15a is panoramic with views of flat desert plain and low hills in the foreground gently sloping up to enclosing rugged variegated tan and brown mountains in the middleground. Exposed earth in the foreground is rocky and pebbly appearing light tan and gray-tan and stippled. Vegetation is sparse and scattered in the immediate foreground with typical shrubs and occasional ocotillos, teddy bear chollas, and occasional saguaros. Vegetation is in shades of light gold, yellow-green, dark green, and gray-green, that is wiry to clumped dotted and more uniform with distance. A broken subtle horizontal line is created where vegetation of the desert plain meets the base of the mountains. The mountains create a rough, broken, and undulating line at the horizon. Lattice structures for the DPV1 line are present in the scene but barely visible and not noticeable. Where faintly visible, the conductor itself is a curvilinear white or light gray horizontal line.

KOP 15b – Kofa East Pinch Point

KOP 15b (Appendix 1, Figure 3.18-20) is located near the eastern boundary of the Kofa NWR at a pinch point between portions of designated wilderness, north of the DPV1 line and adjacent to the Kofa WA. The KOP represents the views of recreationists and backroad travelers within the Kofa NWR looking east at Segment p-06 on USFWS-managed public land, which would parallel the south side of the existing DPV1 line. The view from KOP 15b is slightly enclosed by low dark brown hills in the foreground, with views of rough blue-gray mountains in the distance. Viewers are looking at a flat desert plain in the foreground. The exposed earth in the immediate foreground is light gray-tan tinged with red, coarse, and rocky to stippled. Sparse vegetation is shades of yellow-green, dark green, and gray-green, mostly clumped and wispy, that becomes uniform and indistinct with distance. A vague horizontal line is created where vegetation of the desert plain meets the base of the hills and in front of distant mountains. The mountains create a rough and undulating horizontal line at the skyline. The well-maintained dirt road creates diagonal gray-tan banding in the scene. Lattice structures of the DPV1 line are gray, geometric, and mostly vertical lines with repeated form and features; with soft curvilinear lines created by the conductors themselves. Short white and yellow signage along the road indicates the presence of an underground pipeline. Development is visible and noticeable. Overall, the scene is natural, simple, somewhat scenic, and only minor impact by the existing DPV1 line.

KOP 16 – Kofa #3

KOP 16 (Appendix 1, Figure 3.18-21) is located near the western boundary of the Kofa NWR at a pinch point between portions of designated wilderness, north of the DPV1 line and adjacent to the Kofa WA. The KOP represents the views of recreationists and backroad travelers within the Kofa NWR looking south-southwest at Segment p-06 on USFWS-managed public land. The view from KOP 16 consists of the desert plain, enclosed by rugged, dark brown mountains in the foreground-middleground, with some openings providing views of rugged blue-gray mountains in the background. Exposed earth in the foreground is rocky to stippled in shades of tan, gray, and dark brown. Vegetation is sparse and scattered in the immediate foreground with typical shrubs and occasional ocotillos, teddy bear chollas, and occasional saguaros. Vegetation is in shades of light gold, yellow-green, dark green, and gray-green, that is wiry to clumped dotted and more uniform with distance. A broken subtle horizontal line is created where vegetation of the desert plain meets the base of the mountains. The mountains create a rough, broken, and undulating horizontal line at the skyline. Lattice structures for the DPV1 line are present in the scene but barely visible and not noticeable. Where visible, the line itself is a curvilinear white or light gray horizontal line.

KOP 17 – I-10 Rest Area East

KOP 17 (Appendix 1, Figure 3.18-22) is located at an eastbound rest area along I-10 east of Quartzsite and north of Hovatter Road. The KOP represents the views of eastbound I-10 travelers stopped at the rest area looking southwest at Segments i-03 and x-04, both of which would be located on BLM-administered land designated VRM Class III. Segment i-03 would be on BLM-administered land that are VRI Class III and IV, comprised of scenic quality C and B, and moderate sensitivity, within the foreground-middleground distance zone. Segment i-04 would be on BLM-administered land that are VRI Class II and III, comprised of scenic quality B and C, and high sensitivity, within the foreground-middleground distance zone. The view from KOP 17 is open and panoramic with views of rugged blue-gray mountains in the background. Viewers are looking at a rocky light tan and flat desert plain in the immediate foreground that appears coarse to stippled, and sparsely vegetated. Vegetation is shades of yellow-green, dark green, and gray-green, mostly clumped and wispy, that becomes uniform and indistinct with distance. A subtle horizontal line is created where the desert plain meets the base of the mountains while the mountains create a jagged and undulating horizontal line at the skyline. A canal embankment in the foreground creates a strong horizontal gray line near the center of the view that breaks the vegetation in the immediate foreground from the more distant desert plain. The road in the rest area creates gray to light gray curvilinear lines. Other developments in the rest area are geometric structures and facilities; telephone poles, light poles, fence posts, and signs introduce short vertical lines. Trees and other vegetation in the rest area appear cultivated compared to native vegetation that is scraggly and less vigorous. I-10 and the associated movement of traffic is visible in breaks in the vegetation of the rest area development.

KOP 18 – I-10 Westbound

KOP 18 (Appendix 1, Figure 3.18-23) is located on westbound I-10 on the Vicksburg Road on-ramp and represents the views of westbound traffic on I-10 traveling at highway speeds. Viewers would be looking west at Segments i-03 and x-04 to the southwest, located on BLM-administered land designated VRM Class III. Segment i-03 would be on BLM-administered land that are VRI Class III and IV, comprised of scenic quality C and B, and moderate sensitivity, within the foreground-middleground distance zone. Segment x-04 would be on BLM-administered land that are VRI Class IV, comprised of scenic quality C and moderate and low sensitivity, within the foreground-middleground distance zone. From KOP 18 the view is open and panoramic. The flat desert plain rises slightly in the foreground to meet dark brown rugged mountains in the middleground. Distant rugged mountains are visible at the horizon in the background. The desert in the immediate foreground is sparsely vegetated with lumpy dark green shrubs that become uniform in the distance. An indistinct horizontal line is visible in the landscape where the vegetation of the flat desert plain meets the mountains in the middleground. The distant mountains create a jagged horizontal line at the skyline. The divided highway is flat gray, with linear white and yellow lines, which creates an overall strong diagonal line in the landscape. The barbed wire fends alongside the highway is visible with a number of regularly spaced short vertical red fence posts and faintly visible wire strands. Numerous developments in the foreground introduce vertical lines, including a power line with monopoles that have irregularly repeated vertical lines, the actual power lines of which create horizontal lines.

KOP 19 – Brenda RV Park

KOP 19 (Appendix 1, Figure 3.18-24) is located on private land within an RV park in Brenda, Arizona. The KOP represents the views of RV park residents and visitors looking south at Segments in-01 and i-04, which are both on BLM-administered land designated VRM Classes III and IV. Segment in-01 would be on BLM-administered land that are VRI Class II and III, comprised of scenic quality C and B, and high sensitivity, within the foreground-middleground distance zone. Segment i-04 would be on BLM-administered land that are VRI Class II and III, comprised of scenic quality B and C, and high sensitivity, within the foreground-middleground distance zone. The view from KOP 19 is consists of views of a gently rising desert plain in front of enclosing rugged blue-gray mountains in middleground and background. The exposed earth in the immediate foreground is light gray-tan and rocky to stippled. Vegetation is shades of yellow-green, dark green, gray-green, and light gold; mostly clumped and wispy but punctuated by occasional cylindrical saguaros; and becomes uniform and indistinct with distance. An indistinct horizontal line is created by vegetation where the desert plain meets the base of the mountains. The mountains create a jagged and undulating horizontal line at the skyline. The two-track dirt road creates gently curvilinear gray-tan banding in the scene. The edge of the RV development is visible with light colored rectangular buildings and RVs. Cultivated vegetation in the RV park, including palm trees, contrast with the low shrubby native vegetation.

KOP 20 – Gold Nugget Road

KOP 20 is located east of Quartzsite along Gold Nugget Road south of I-10 on BLM-administered land designated VRM Class III. The area is used for dispersed camping and other recreational uses, and therefore represents the views of recreationists in the area that would be looking north-northwest at Segment in-01 and south-southeast at Segment i-04, which are both on BLM-administered land designated VRM Classes III. Segment in-01 would be on BLM-administered land that are VRI Class II and III, comprised of scenic quality C and B, and high sensitivity, within the foreground-middleground distance zone. Segment i-04 would be on BLM-administered land that are VRI Class II and III, comprised of scenic quality B and C, and high sensitivity, within the foreground-middleground distance zone. The view from KOP 20 looking north-northwest (Appendix 1, Figure 3.18-25a) is somewhat enclosed to the east by rocky low hills and mountains. There are dark brown rocky hills and mountains in the foreground-middleground, with faint distant views of blue-gray mountains in the distant background. There is an open, light gray and relatively flat and smooth, largely unvegetated area in the foreground surrounded by sparse clumped wispy vegetation. Green, yellow-green, and gray-green vegetation becomes lumpy to uniform with distance. The mountains form a rough and jagged horizontal line at the skyline, while the flat unvegetated plain and vegetation band in the foreground create distinct flat horizontal lines. A few isolated saguaros create short vertical lines. Development visible included a few white structures in the foreground-middleground that appear as white dots. Overall, the scene is very natural and only minimally impacted by development, but may appear more developed and disturbed with the presence of RVs when used for dispersed camping.

The view from KOP 20 looking south-southeast (Appendix 1, Figure 3.18-25b) is somewhat enclosed by rocky low hills and mountains. There are dark brown rocky hills and mountains in the foreground-middleground, with distant views of rugged dark mountains in the middleground to background. The immediate foreground consists of rolling and undulating rocky to pebbly light tan to gray desert with sparse clumped wispy vegetation and punctuated by occasional saguaros.

Green, yellow-green, and gray-green vegetation becomes lumpy to uniform with distance. The mountains form a rough and jagged horizontal line at the skyline. The exposed earth and vegetation band in the foreground create subtle horizontal lines at the base of the mountains. Evidence of off-road travel creates curvilinear lines in the exposed earth. Aside from evidence of off-road travel, no development is visible.

KOP 59 – I-10 South of Brenda

KOP 59 (Appendix 1, Figure 3.18-26) is located along the shoulder of eastbound I-10 south of Brenda, Arizona. The KOP represents the views of travelers on eastbound I-10 looking east-northeast at Segment in-01 crossing from BLM-administered land on the south to the north side of I-10. Segment in-01 would be on BLM-administered land that are VRI Class II and III, comprised of scenic quality C and B, and high sensitivity, within the foreground-middleground distance zone. The view from KOP 59 is slightly enclosed to the north by a gently rising rugged domed mountain in the distant foreground-middleground. The domed mountain is coarsely textured rock and drainages that are softened by vegetation growing on the slopes. The exposed earth in the immediate foreground is light gray-tan and rocky to stippled. Vegetation is shades of yellow-green, dark green, gray-green, and light gold; densely clumped and wispy but punctuated by occasional cylindrical saguaros; and becomes uniform and indistinct with distance. A gently undulating horizontal line is created by the domed mountain at the skyline and a short less distinct horizontal line occurs where dense vegetation in the foreground meets the skyline. The black freshly paved I-10 and its associated tan gray shoulder create strong horizontal and diagonal lines that draw the viewers eye to the east. With exception of I-10, the landscape is soft, mounded, and horizontal, with the only vertical elements provided by the short vertical lines of the saguaros.

KOP 60 – I-10 Eastbound at Hovatter Road

KOP 60 (Appendix 1, Figure 3.18-27) is located along the Hovatter Road on-ramp on eastbound I-10 east of Quartzsite, Arizona. The KOP represents the views of eastbound I-10 travelers looking east at Segments i-01, i-02, i-03, x-02a, and x-03, all of which would be located on BLM-administered land designated VRM Class III. Segments i-01, i-02, and x-02 would be on BLM-administered land that are VRI Class IV, comprised of scenic quality C and moderate sensitivity, within the foreground-middleground distance zone. Segment i-03 would be on BLM-administered land that are VRI Class III, comprised of scenic quality C and B, and moderate sensitivity, within the foreground-middleground distance zone. Segment x-03 would be on BLM-administered land that are VRI Class III, comprised of scenic quality C and moderate and high sensitivity, within the foreground-middleground distance zone. The view from KOP 60 is open and panoramic with views of rugged blue-gray mountains in the background and smaller rugged light tan to dark brown hills in the distant foreground-middleground. Viewers are looking at a light tan and flat desert plain in the immediate foreground that appears stippled to smooth, and sparsely vegetated. Vegetation is shades of yellow-green, dark green, and gray-green, mostly clumped and wispy, that becomes uniform and indistinct with distance. A subtle horizontal line is created where the desert plain meets the base of the mountains and horizon, while the mountains create a jagged and undulating horizontal line at the skyline. The gently curvilinear gray paved on-ramp to I-10 dominates the view and leads the viewer to look east into the distance. White delineators and dark brown metallic fence posts are evenly spaced and provide a series of short vertical lines along the road. A dirt road on the other side of the fence appears as curvilinear tan-gray banding in the desert plain.

A series of single distribution line power poles are evenly spaced and visible as short vertical lines in the distant foreground-middleground. Vehicles are dotted in the distance on I-10.

KOP 62 – Alt SCS, I-10 South of Brenda

KOP 62 (Appendix 1, Figure 3.18-28) is located along westbound I-10 south of Brenda, Arizona. The KOP represents the views of travelers on westbound I-10 looking southwest at the alternative site of the SCS, which would only be constructed in this location if an alternative route including some combination of Segments i-03, i-04, and x-04 is constructed. These segments cross BLM-administered land (VRM Class III). The view from KOP 62 to the southwest is a focal one, with the break in the nearby hills drawing the eye to the more distant mesas visible near the center of the view. The topography along the southern side of the roadway also partially encloses the view to the south. The hills are covered with clumped vegetation, which softens further a somewhat smooth and granular texture. The exposed earth within the roadway median is light to dark gray-tan and stippled to smooth. Vegetation in the median and on the south side of the interstate is shades of green, yellow, and orange; densely clumped and wispy but punctuated by occasional cylindrical saguaro; and becomes uniform and indistinct with distance. A generally downward sloping horizon is evident across the view, from left to right. The presence of the black asphalt of I-10 and its associated tan gray shoulder create a strong line that extends across the view. The varied, but clearly defined, skyline shaped by the nearby hills and more distant mesas and mountains, provides another strong line in the view. The short vertical lines of the saguaros are the most prominent vertical element in the view. Overall, the roadway is the view's dominant feature but the scene beyond, to the south, appears natural and somewhat scenic with the variety of vegetation and interesting landforms.

KOP 63 – Alt SCS, I-10 South of Brenda

KOP 63 (Appendix 1, Figure 3.18-29) is located along eastbound I-10 south of Brenda, Arizona. The KOP represents the views of travelers on eastbound I-10 looking southeast at the alternative site of the SCS, which would only be constructed in this location if an alternative route including some combination of Segments i-03, i-04, and x-04 is constructed. These segments cross BLM-administered land (VRM Class III). The view from KOP 63 is partially enclosed to the south by a somewhat rounded hill with a gentle escarpment in the foreground and a partially visible jagged hillside in the middleground. The hill is covered with clumped vegetation, which softens further a somewhat smooth and granular texture on the hill. The exposed earth along the roadside in the immediate foreground is light to dark gray-tan and stippled to smooth. Vegetation is shades of green, yellow, and orange; densely clumped and wispy but punctuated by occasional cylindrical saguaro; and becomes uniform and indistinct with distance. An asymmetrical horizontal line is created by the near hillside and more distant skyline in the right side of the view and the relatively flat horizon in the center and left portion of the view. The presence of the black asphalt of I-10 and its associated tan gray shoulder create a strong line down the left edge of the view. However, the northern slope of the hill in the foreground, in conjunction with vegetation in the immediate foreground, create a slightly concave area in the center of the view and it is here that the viewer's eye is drawn. In between the paved roadway and relatively discrete hill and mountains, the landscape is soft and horizontal. The short vertical lines of the saguaros are the most prominent vertical element in the view. Overall, the scene is natural and somewhat scenic with the variety of vegetation and interesting landform to the south.

I-10 Linear KOP

Traveling westbound along I-10 at highway speeds and entering the Project Area from the east, there are low rough hills either side of the highway, enclosing the eastern end of the East Plains Zone. The viewer can see the DPV1 structures crossing the highway, coming out from behind the hills to the south, then going north in front of the hills. Once the viewer crosses under the eastern crossing of I-10 by the DPV1 line and through the hills either side of the highway, the view opens up to a wide desert plain. The Delaney Substation is tucked slightly behind the hills south of I-10, and is difficult for westbound travelers to see, but is more clearly visible for eastbound travelers. Figure 3.18-2 (Appendix 1) shows that the scenic quality ratings for the area visible around I-10 are higher to the south than to the north. While mountainous terrain is visible in both directions, the higher scenic quality to the south, including views of Saddleback Mountain, Courthouse Rock, and mountains areas of the Kofa NWR attract the attention of viewers traveling along I-10.

Continuing west on I-10, viewers see the DPV1 line merging with and crossing I-10 from north to south, then diverging from I-10 as viewers continue to travel west. Views remain open and unimpeded except for a slight enclosure where the highway passes through another small range of low rugged hills. Views to the south continue to demand attention and evolve as the viewer comes closer to the New Water Mountains WA, Kofa NWR, and Kofa WA. On the western edge of the East Plains Zone, views along westbound I-10 become enclosed by (name) mountains.

KOP points representing views of travelers on I-10 through the East Plains Zone included KOPs 3, 8, 17, 18, 20, 59, and 60.

3.18.3.5 Quartzsite Zone

Zone Overview

The Quartzsite Zone is west of East Plains and Kofa Zone, and is a long linear zone, encompassing all segments that provide connectivity between East Plains and Kofa Zone and Copper Bottom Zone, and would go through, around, or avoid the Town of Quartzsite. The Quartzsite zone is a north-south trending valley between two mountain ranges with the Town of Quartzsite located along I-10 in the northern portion of the zone. The eastern side of the zone is delineated by mountains that enclose around I-10, creating a somewhat tight pass as travelers move between the broad open desert plain of the East Plains and Kofa Zone and the Quartzsite Zone. The main transportation routes through the zone include I-10 (east-west) and Highway 95 (north-south), although there are a myriad of dirt roads and two-track routes throughout the area. Similar to the East Plains Zone, vegetation communities vary in diversity and visual interest by elevation and scenic mountain ranges attract attention. The zone is attractive and heavily used for winter tourism and recreation, including the BLM's La Posa LTVA, extensive areas of BLM-administered land open for 14-day camping, OHV routes and trails, the Quartzsite Rock and Gem Show, and more than 25 campgrounds and RV parks. As such, the largest number of sensitive viewers in this zone are tourists and recreationists, along with travelers on I-10. However, residents of Quartzsite are very sensitive to utility development, impacts on views, and potentially related impacts on property values and the tourist industry. Other development in Quartzsite is concentrated at the I-10 exits and along the main route through town, including gas stations, fast food, restaurants, lodging, and gift shops. Proposed Action Segment p-09 clips the northeast corner of the YPG, another important land use in the zone and contributor to the Quartzsite economy.

The portion of the Proposed Action to the south of Quartzsite, which runs from the western edge of the Kofa NWR to the YPG, has a Class III VRI classification (Appendix 1, Figure 3.18-1) with a small portion of Class II on the westernmost part of segment p-09. Scenic quality (Appendix 1, Figure 3.18-2) of this area has been rated as C, and the westernmost part of segment p-09 has been rated B. Viewer sensitivity (Appendix 1, Figure 3.18-3) around these segments is high. The VRM classifications for this zone (Appendix 1, Figure 3.18-30) are almost entirely Class II (Segments p-07 and parts of p-09), with a small portion of Class III (part of Segment p-09) on the northeastern corner of the YPG. The Proposed Action follows a BLM-designated utility corridor.

The Alternative segments around Quartzsite (Segments x-06, x-07, qn-01, qn-02, qs-01, and qs-02) have a Class III VRI classification (Appendix 1, Figure 3.18-1) with a few scattered areas of Class II that increase as segments move to the west of Quartzsite. Scenic quality (Appendix 1, Figure 3.18-2) of the zone is rated as C (majority), with more land rated as B to the west of Quartzsite. Viewer sensitivity (Appendix 1, Figure 3.18-3) for these Alternative segments is high. VRM classification (Appendix 1, Figure 3.18-30) is mostly Class III; however, all segments have some areas of Class IV and the segments that meet with the Proposed Action to the south of Quartzsite go through a small portion of Class II land (Segments x-07 and x-06). The Alternative segments that are adjacent to I-10 are in a BLM-designated utility corridor (WWEC 30-52).

All segments within the Quartzsite Zone would be in the foreground-middleground distance zone. Table 3.18-3 summarizes segment information for the Quartzsite Zone.

The Proposed Action does not cross the La Posa LTVA, but some of the Alternative segments do cross the La Posa LTVA. In addition, Segments qn-02 and qs-02 cross the BLM's Dome Rock Mountain 14-Day camping area located to the west of Quartzsite (Appendix 1, Figure 3.18-31).

Sources of nighttime light and glare in this portion of the study area include the existing DPV1 line with its FAA-required safety lights, Town of Quartzsite businesses and residential development; the lights of vehicles traveling along I-10 and Highway 95; and during the winter visitor use season, campers using the surrounding BLM-administered land.

Table 3.18-3 Segment Summary for the Quartzsite Zone

SEGMENT	SCENIC QUALITY	SENSITIVITY	DISTANCE ZONE	VRI CLASS	VRM CLASS
PROPOSED ACTION					
p-07	C	High	Foreground-middleground	III	III
p-08	C	High	Foreground-middleground	III	III
ALTERNATIVE SEGMENTS					
i-05	C	High	Foreground-middleground	III	III
qn-01	C	High	Foreground-middleground	III	III
qn-02	C and B	High	Foreground-middleground	III and II	III and IV
qs-01	C	High	Foreground-middleground	III	III
qs-02	B and C	High	Foreground-middleground	II and III	III and IV
x-05	C and B	High	Foreground-middleground	III	III and II
x-06	C	High	Foreground-middleground	III	III, IV, and II
x-07	C	High	Foreground-middleground	III	III

Scenic Quality categories: A = High, B = Medium, C = Low

VRI classes: I = areas where the current management situation requires maintaining a natural environment essentially unaltered by man, II/III/IV = based on combinations of scenic quality, sensitivity levels, and distance zones as displayed in Table 3.18-3.

VRM classes: I = Objective is to preserve the existing character of the landscape. Provides for natural ecological changes; but does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

II = Objective is to retain the existing character of the landscape. Level of change to the characteristic landscape should be low. Management activities may be seen but should not attract attention of the casual observer. Changes must repeat the basic elements found in the predominant natural features of the characteristic landscape.

III = Objective is to partially retain existing character of the landscape. Level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

IV = Objective is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. Any action necessary to prevent unnecessary and undue degradation to the land is to be taken, such as, but not limited to, careful location, minimal disturbance, and repeating the basic elements.

Notes: If more than one value applies to a segment, both values are provided showing the value with the highest proportion of the segment first.

N/A indicates that the segment does not lie on BLM land or that a value was not applied to that segment by the BLM.

KOP 21 – Mitchell Mine Road Residence

KOP 21 (Appendix 1, Figure 3.18-32) is located southeast of Quartzsite and south of I-10 along Mitchell Mine Road. KOP 21 looks west-northwest, representing the views of a nearby residence on private property, recreationists, and back road travelers looking at Segment x-05, located on BLM-administered land designated VRM Class III and II. Segment x-05 would be on BLM-administered land that are VRI Class III, comprised of scenic quality C and B, and high sensitivity, within the foreground-middleground distance zone. The view from KOP 21 is open and panoramic with a low ridge of flat desert plain in the immediate foreground, desert plain at a lower elevation in the foreground-middleground, rugged and rocky low hills in the foreground, with distant views of blue-gray rugged mountains in the background. The immediate foreground consists of somewhat rolling and undulating rocky to pebbly tan to gray desert pavement with sparse clumped wispy vegetation and cacti, punctuated by saguaros. Green, yellow-green, gray-green, and light gold vegetation becomes lumpy to uniform with distance. The mountains form a rough and jagged horizontal line at the skyline. The exposed earth and vegetation band in the foreground create subtle curvilinear lines, and banded vegetation creates subtle horizontal lines at the base of nearby hills and distant rugged mountains. No development is visible.

KOP 22 – BLM LTVA #1

KOP 22 (Appendix 1, Figure 3.18-33) is located southeast of Quartzsite on BLM-administered land, within the La Posa LTVA, which is designated VRM Class IV. KOP 22 represents the views of users at the eastern edge of the LTVA looking east-southeast at Segments x-05 and x-06, also on BLM-administered land. Segment x-05 would be on BLM-administered land that are designated VRM Class II and III, comprised of lands designated VRI Class III, scenic quality C and B, and high sensitivity, within the foreground-middleground distance zone. Segment x-06 would be on BLM-administered land that are designated VRM Class III, IV, and II comprised of lands designated VRI Class III, scenic quality C and high sensitivity, within the foreground-middleground distance zone. The view from KOP 22 looking east-southeast is open, flat desert plain in the foreground stretching to the base of tan to brown rugged and rocky mountains in the middleground. Exposed tan to gray earth in the foreground is rocky to pebbly with textures ranging from coarse to stippled to smooth. The immediate foreground is sparsely vegetated with wispy green, yellow-green, and gray green vegetation that is punctuated by scattered saguaros and becomes lumpy to uniform in the distance. Two-track routes create light tan-gray banded horizontal lines in the immediate foreground. Vegetation on the plain at the base of the mountains creates a subtle horizontal line that is further emphasized by vegetation in the immediate foreground; while the mountains themselves create a rough and jagged horizontal line at the skyline. Aside from the two-track routes, no development is visible. This KOP is located at the eastern edge of the LTVA, and the photo was taken during the off-season. During the heavy use visitor season, it is possible that RVs, associated camping accoutrements, and OHVs would be visible, making the view appear more developed and busy.

KOP 23 – BLM LTVA #2

KOP 23 is located southeast of Quartzsite on BLM-administered land, within the La Posa LTVA, which is designated VRM Class IV. KOP 23 represents the views of users near the eastern edge of the LTVA looking east-southeast at Segments x-05 and x-06 (Appendix 1, Figure 3.18-34a), and looking west-northwest (Appendix 1, Figure 3.18-34b) represents the views of users near the eastern edge of the LTVA looking at Segment x-07; all of which are on BLM-administered land.

Segment x-05 would be on BLM-administered land that are designated VRM Class II and III, comprised of lands designated VRI Class III, scenic quality C and B, and high sensitivity, within the foreground-middleground distance zone. Segment x-06 would be on BLM-administered land that are designated VRM Class III, IV, and II comprised of lands designated VRI Class III, scenic quality C and high sensitivity, within the foreground-middleground distance zone. Segment x-07 would be on BLM-administered land that are designated VRM Class III, comprised of lands designated VRI Class III, scenic quality C and high sensitivity, within the foreground-middleground distance zone. The view from KOP 23 is open and panoramic with flat desert plain in the immediate foreground with tan to brown rugged and rocky mountains in the middleground. Exposed tan to gray earth in the foreground is rocky to pebbly with textures ranging from coarse to stippled to smooth. The immediate foreground is very sparsely vegetated with wispy green, yellow-green, and gray green vegetation that is punctuated by a few saguaros and becomes lumpy to uniform with distance. Foreground vegetation creates an indistinct horizontal line and blocks the view of the base of the mountains in the middleground. Mountains in the middleground form a jagged horizontal line at the skyline. A two-track route creates a light tan-gray banded horizontal line in the immediate foreground. Other variations in color and texture of exposed earth in the foreground creates irregular and sometimes indistinct lines and patterns that suggest horizontal line. Looking east-southeast, aside from the subtle two-track route, no development is visible; however, looking west-northwest Vehicles and tent structures are noticeable in the view, but are dwarfed by the expanse of the desert. However, during the winter heavy visitor use season, a few to numerous RVs and associated camping accoutrements (tents, etc.) would be visible, and portions of the view could be blocked by campers, which could make the view appear more developed, busy, and congested.

KOP 24 – RV Park Quartzsite

KOP 24 (Appendix 1, Figure 3.18-35) is located outside an RV park on private property south of Quartzsite, Arizona and north of the La Posa LTVA. The KOP represents the views of RV park residents looking south-southeast who would be viewing Segments qs-01 or x-06 on BLM-administered land designated VRM Class III. Both Segments qs-01 and x-06 would be on BLM-administered land that are VRI Class III, comprised of scenic quality C and high sensitivity, within the foreground-middleground distance zone. However, Segment qs-01 is designated VRM Class III while Segment x-06 is designated VRM Class III, IV, and II. A portion of Segment qs-01 would be crossing through the LTVA. The view from KOP 24 is open and panoramic. Viewers are looking at flat desert plain in the immediate foreground, with a rugged mountainous middleground to background. Sparse green, dark green, and yellow-green native vegetation is clumped and rounded in the foreground, becomes more uniform with distance to form an irregular green horizontal line at the base of the mountains. Variations in the light gray, dark gray-brown and light tan exposed earth create irregular but subtly horizontal lines and give the foreground a banded appearance. The rugged mountains create a jagged and broken irregular horizontal line at the skyline. The light gray to dark gray paved roads and their shoulders create distinct horizontal lines in the immediate foreground. Brown fence posts create short distinct vertical lines that are regularly repeated and connected by short undulating horizontal lines of chain. The series of metal monopoles of the WAPA 161kV transmission line create a series of repeated strong vertical lines that are reduced in intensity by background topography and intervening vegetation, and fade into the distance. The associated power lines are faintly visible as diagonal and undulating.

KOP 26 – Quartzsite Civic Event Parcel

KOP 26 (Appendix 1, Figure 3.18-36) is located along the gravel frontage road on the south side of I-10 south of Quartzsite, Arizona and north of the La Posa LTVA. The KOP represents the views of drivers on the frontage road and RV park residents looking southwest, who would be viewing Segment qs-02 weaving through the mountains within an area designated VRM Class III, and a portion of which would cross the LTVA. Segment qs-02 would be on BLM-administered land that are VRI Class II and III, comprised of scenic quality B and C, and high sensitivity, within the foreground-middleground distance zone. The view from KOP 26 is open and panoramic. Viewers at the KOP are looking at a gravel parking lot within an RV park in the immediate foreground; however, viewers within the RV park may be closer. Dark brown low hills and rugged mountains are in the middleground, and gray-blue rugged mountains are in the background. The parking lot is flat and uniformly light tan-gray and stippled. Sparse golden tan rounded shrubs line the frontage road and sparse clumped green, dark green, and yellow-green native vegetation quickly becomes more uniform with distance to form an irregular green horizontal line at the base of the low hills and mountains. The hills and rugged mountains create a jagged and broken irregular horizontal line at the skyline. Tire tracks in the gravel of the frontage road create converging vertical lines in the foreground. Brown fence posts create short distinct vertical lines that are irregularly repeated and occasionally connected by short undulating diagonal lines of chain. numerous single wood power poles create scattered strong vertical lines that are faded with distance. A lattice structure with a cylindrical tank on top is in the immediate foreground, while road signs and colored business signs line I-10. Several small cubical buildings and white RVs are visible. During the winter heavy visitor season, the RV park would likely be full of RVs, which would partially block the view of the low hills and mountains.

KOP 27 – Boyer Road – Quartzsite North Side

KOP 27 (Appendix 1, Figure 3.18-37) is located on Boyer Road on the north edge of Quartzsite, Arizona. The KOP represents the views of residents of a neighborhood block looking northeast, north, and northwest, who would be viewing Segment qn-02 that would cross BLM-administered lands designated VRM Class III and IV to the northeast and northwest, and state trust lands to the north. Segment qn-02 would be on BLM-administered land that are VRI Class III and II, comprised of scenic quality C and B, and high sensitivity, within the foreground-middleground distance zone. The view from KOP 27 is open and panoramic. Viewers are looking at flat desert plain framed by rugged mountains in the background to the northeast and northwest. Exposed tan-gray earth in the foreground has been heavily impacted by a maintained dirt road and off-road travel. Native vegetation is absent in the immediate foreground, and is sparse green, dark green, and yellow-green, clumped and rounded in the distant foreground; becoming dotted to uniform to create a green horizontal line at skyline and base of the mountains. The rugged mountains create a jagged and broken irregular horizontal line at the skyline. The edges of the dirt road and tracks from off-road travel create converging diagonal to curvilinear lines going into the distance. The communications tower is a prominent vertical focus of attention, while the short vertical lines of the WAPA 161kV monopoles are barely visible to the northeast.

KOP 28 – Highway 95 LTVA

KOP 28 (Appendix 1, Figure 3.18-38) is located at the intersection of Highway 95 and North 53rd Street south of Quartzsite, Arizona. The KOP represents the views of travelers on Highway 95 or 53rd Street at the intersection, looking south viewing Segment x-07 on BLM-administered land designated VRM Class III. Segment x-07 would be on BLM-administered land that are designated VRM Class III, comprised of lands designated VRI Class III, scenic quality C and high sensitivity, within the foreground-middleground distance zone. The view from KOP 28 is open and panoramic. Viewers are looking at flat desert plain with rugged mountains in the middleground to background. Exposed tan-gray earth in the foreground is stippled. Native vegetation is very sparse in the immediate foreground, and is sparse green, dark green, and yellow-green, clumped and rounded with distance; becoming dotted to uniform and punctuated with saguaros, forming an irregular green horizontal line at skyline and base of the mountains. The rugged mountains create a jagged and broken irregular horizontal line at the skyline. The light gray and white striped road surface creates clear horizontal and diagonal lines in the foreground, with the color banding in the road shoulders repeating some lines. The WAPA 161kV H-frame structures create strong vertical and geometric repeated lines going into the distance, while the monopoles on the opposite side of the road also somewhat repeat vertical lines. The transmission line itself is faintly visible, horizontal to curvilinear. Road signs and other signs at the intersection add colors and irregular short vertical lines that look jumbled.

KOP 29 – Highway 95 Crossing

KOP 29 (Appendix 1, Figure 3.18-39) is located south of Quartzsite, Arizona at the intersection of Highway 95 and the gravel road that travels west-northwest through Copper Bottom Pass, or east providing access along the DPV1 line. The KOP represents the views of travelers on Highway 95 or Copper Bottom Pass Road at the intersection, looking southeast, viewing Segments x-07, x-06, x-05, p-07, and p-08 on BLM-administered land. Segments x-05, 06, and 07, and p-07 and 08 would all be on BLM-administered land that are VRI Class III, comprised mostly of scenic quality C and high sensitivity, within the foreground-middleground distance zone. However, Segments x-05 and 06 would be on lands designated VRM Class II, III, and IV; while Segments x-07, p-07, and 08 would be on lands designated VRM Class III. The view from KOP 29 is open and panoramic. Viewers are looking at flat desert plain with rugged mountains in the middleground to background. Exposed tan-gray earth in the foreground is stippled. Vegetation is very sparse in the immediate foreground, and is sparse green, dark green, and yellow-green, clumped and rounded with distance; becoming dotted to uniform and punctuated with saguaros, forming an irregular green horizontal line at skyline and base of the mountains. The rugged tan, dark brown, black, and blue-gray mountains create a jagged and broken irregular horizontal line at the skyline. The gravel road texture variation creates diagonal and slightly curvilinear banding. The WAPA 161kV H-frame structures, monopole distribution structures, and DPV1 lattice structures create strong vertical and geometric repeated lines, but the scene appears cluttered jumbled with differing structure types and intervals. The transmission line itself is horizontal and curvilinear. Overall, the scene is developed with the lines created by the various structure types. The naturalness of the surroundings is diminished by the amount and variety of development.

KOP 61 – I-10 Eastbound West of Quartzsite

KOP 61 (Appendix 1, Figure 3.18-40) is located along eastbound I-10 west of Quartzsite, Arizona. The KOP represents the views of eastbound I-10 travelers looking east at Segments i-06, qn-02, or qs-02, all of which would be located on BLM-administered land. Segments i-06, qn-02, and qs-02 would all be on BLM-administered land that are comprised of scenic quality C and B, and high sensitivity, within the foreground-middleground distance zone, and VRM Class III and IV. The extent of the view from KOP 61 is limited by views of rugged blue-gray mountains in the background and smaller rugged light tan to dark brown hills in the distant foreground-middleground. Viewers are looking at a light tan slightly rolling desert plain in the immediate foreground that appears coarse and rocky to stippled, and sparsely vegetated. Vegetation is shades of yellow-green, dark green, and gray-green, mostly clumped and wispy, that becomes uniform and indistinct with distance. The desert plain gently slopes lower in elevation and the Town of Quartzsite (approximately 5 miles away) appears as a horizontal elongated cluster of dots in the middleground. A series of subtle horizontal lines are created in the foreground where vegetation follows undulation in the desert plain and meets the base of the nearest rugged hills, while the mountains create a jagged and undulating horizontal line at the skyline. The diagonal and flat gray paved I-10 is prominent in the view and leads the viewer to look east into the distance. Fence posts provide a series of short vertical lines barely noticeable in the vegetation to the south. Vehicles are dotted in the distance on I-10.

I-10 Linear KOP

Traveling westbound on I-10 in the Quartzsite Zone, viewers emerge from the enclosed views of the Plomosa Mountains looking across a north-south trending valley that dips down to the Town of Quartzsite, then increases in elevation as I-10 continues westward through the Dome Rock Mountains. While views are scenic looking both north and south, similar to the East Plains Zone, southern views of the Kofa WA and NWR attract viewers' attention.

During the winter months (roughly October through March) viewers traveling along I-10 will notice individual, clustered RVs in campsites in the low hills or wash areas; and densely occupied areas of RVs on the desert plain as they approach Quartzsite. Also, while approaching Quartzsite from the east, viewers will see monopole structures and conductors of the WAPA 161kV transmission line crossing I-10 after circumnavigating Quartzsite to the north, then briefly crossing the La Posa LTVA to the south.

Passing through Quartzsite, the scene is typical of small towns along interstate or other major highways, with fast food restaurants, gas stations, truck stops, lodging, and residences. In the winter months. Quartzsite appears bustling and congested with packed RV parks, people, and vehicles in the area, especially during the Gem and Rock Show in January. The small town enjoys a backdrop of scenic mountains near the highway and enclosing views to the south, and somewhat more distant to the north. West of Quartzsite, the view becomes rapidly enclosed as the highway enters the Dome Rock Mountains.

KOP points representing the views along I-10 in the Quartzsite Zone include KOPs 26 and 61.

Highway 95 Linear KOP

Highway 95 travels north-south through the north-south trending valley containing the Town of Quartzsite and the Quartzsite Zone being used for analysis of impacts in this Technical Environmental Study. The stretch of Highway 95 south of Quartzsite in the Project Area is heavily used for recreation access in the Quartzsite area. The La Posa LTVA is accessed from Highway 95 just south of Quartzsite, and gravel roads from Highway 95 offer access to the Kofa NWR to the east and the Copper Bottom Pass area in the Dome Rock Mountains to the west.

Southbound travelers on Highway 95 south of Quartzsite are looking at the relatively narrow desert plain between the Plomosa and New Water Mountains on the east and Dome Rock Mountains on the west. On the east side of the highway are monopole and H-frame structures of the WAPA 161kV transmission line. On the west side of the highway are single wood pole structures for local distribution and/or telephone lines. The La Posa LTVA is located on both the east and west sides of Highway 95, with occasional visitor contact stations. In winter months, the area would be densely occupied with RVs. In times outside of the heavy visitor use season, the area appears even more sparsely vegetated than the surrounding landscape and dotted with occasional RVs. Pipeline Road west of Highway 95 provides access to a small residential community that is distantly visible from the Highway.

KOP points representing the views along Highway 95 in the Quartzsite Zone include KOPs 28 and 29.

3.18.3.6 Copper Bottom Zone

Zone Overview

The Copper Bottom Zone contains a portion of the Dome Rock Mountains and provides connectivity between Quartzsite Zone and Colorado River and California Zone. The Copper Bottom Zone is scenic, mostly rugged and mountainous, and is valued and heavily used for winter recreation in conjunction with tourism and recreation in the Quartzsite Zone. The main transportation routes through this zone are I-10 through the northern portion of the zone and the Copper Bottom Pass Road, which traverses the Dome Rock Mountains. While there are a myriad off-road trails and routes in the area, aside from Copper Bottom Pass Road, the only other route through the Dome Rock Mountains is through Johnson Canyon, which is valued for the technical OHV route it offers. Vegetation is denser and uniform at the lower elevations surrounding the mountains but becomes more diverse and contributes to the scenic value with various cacti at higher elevations. The main developments in this zone are the DPV1 transmission line, a communications site atop Cunningham Peak, and a distribution power line on monopoles providing power to the communications site. A small residential development is located west of Highway 95 and off of Pipeline Road. The largest number of sensitive viewers in this zone would be travelers on I-10; however, recreationists in this heavily used area would be more sensitive to visual changes.

For the portion of the Proposed Action through the Copper Bottom Pass Zone, shown in Figure 3.18-41 (Appendix 1), the VRI classification (Appendix 1, Figure 3.18-1) has been determined to be Class IV (most of Segment p-13 through p-15e and part of p-12) and a mix of Class II and III (p-09 through part of p-12). Scenic quality (Appendix 1, Figure 3.18-2) of the area ranges from a rating of B around the Copper Bottom Pass Area and mostly a rating of C to the west. Viewer sensitivity (Appendix 1, Figure 3.18-3) in the zone is high (Copper Bottom Pass Area) or moderate (between Copper Bottom and Colorado River). The VRM classification of this area (Appendix 1, Figure 3.18-41) is mostly Class II (Segments p-09 through p-11, parts of p-12, p-13, and p-14) with a few areas of Class III (parts of Segments p-12, p-13, and p-14). The Proposed Action follows a designated BLM utility corridor.

The Alternative segments in this zone have approximately the same classifications as the Proposed Action. VRI classification (Appendix 1, Figure 3.18-1) for this area is mostly a mix of Class II and Class III around the Copper Bottom Pass Area and Johnson Canyon, Class IV to the west. Scenic quality (Appendix 1, Figure 3.18-2) is rated as B for the easternmost portion of the area and as C to the west of the Dome Rock Mountains. Viewer sensitivity (Appendix 1, Figure 3.18-3) is high around the easternmost portion of this area and is moderate for the remainder of this area. Most of the Alternative segments to the south of the Proposed Action pass through mostly VRM Class II lands, with a few areas (all of cb-06 and parts of cb-04 and cb-05) in Class III lands. Segments i-06, i-07, and x-08 all pass through VRM Class III lands (Appendix 1, Figure 3.18-41). Alternative segments along I-10 follow a BLM-designated utility corridor (West-Wide Energy Corridor 30-52).

Most segments within the Copper Bottom Zone would be in the foreground-middleground distance zone; however, a few would be within the seldom seen distance zone. Table 3.18-4 summarizes segment information for the Copper Bottom Zone.

Table 3.18-4 Segment Summary for the Copper Bottom Zone

SEGMENT	SCENIC QUALITY	SENSITIVITY	DISTANCE ZONE	VRI CLASS	VRM CLASS
PROPOSED ACTION					
p-09	C and B	High	Foreground-middleground	II, III	III
p-10	B	High	Foreground-middleground	II	III
p-11	B	High	Foreground-middleground and Seldom Seen	II, III	III
p-12	C and B	Moderate and High	Foreground-middleground and Seldom Seen	II, III, IV	III
p-13	C	Moderate	Foreground-middleground and Seldom Seen	IV	III
p-14	C	Moderate	Foreground-middleground and Seldom Seen,	IV	III
ALTERNATIVE SEGMENTS					
cb-01	B	High	Foreground-middleground	II	II, III
cb-02	B	High	Foreground-middleground and Seldom Seen	II, III	II, III
cb-03	B	High	Foreground-middleground and Seldom Seen,	II	III

SEGMENT	SCENIC QUALITY	SENSITIVITY	DISTANCE ZONE	VRI CLASS	VRM CLASS
cb-04	B	High and Moderate	Foreground-middleground and Seldom Seen,	II, III, IV	II and III
cb-05	B and C	Moderate	Foreground-middleground and Seldom Seen,	III, IV	II and III
cb-06	C and B	Moderate	Foreground-middleground,	IV	III
i-06	B and C	High	Foreground-middleground,	II, III	III
i-07	N/A	N/A	N/A	IV	N/A
x-08	N/A	N/A	N/A	IV	N/A

Scenic Quality categories: A = High, B = Medium, C = Low

VRI classes: I = areas where the current management situation requires maintaining a natural environment essentially unaltered by man, II/III/IV = based on combinations of scenic quality, sensitivity levels, and distance zones as displayed in Table 3.18-4.

VRM classes: I = Objective is to preserve the existing character of the landscape. Provides for natural ecological changes; but does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

II = Objective is to retain the existing character of the landscape. Level of change to the characteristic landscape should be low. Management activities may be seen but should not attract attention of the casual observer. Changes must repeat the basic elements found in the predominant natural features of the characteristic landscape.

III = Objective is to partially retain existing character of the landscape. Level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

IV = Objective is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. Any action necessary to prevent unnecessary and undue degradation to the land is to be taken, such as, but not limited to, careful location, minimal disturbance, and repeating the basic elements.

Notes: If more than one value applies to a segment, both values are provided showing the value with the highest proportion of the segment first.

N/A indicates that the segment does not lie on BLM land or that a value was not applied to that segment by the BLM.

Alternative Segment i-06 passes through the BLM's Dome Rock Mountain 14-Day camping area (Appendix 1, Figure 3.18-31). Alternative Segment i-07 passes within 1 mile of Quechan Marina Park, which lies to the north of the Project Area. Additionally, the Proposed Action (except for Segment p-10) passes within 1 mile of the Colorado River Corridor Destination SRMA, which lies to the south of the Project Area. Most of the Alternative segments (except for Segments i-07 and x-08) also pass through this SRMA.

Sources of nighttime light and glare in this zone include the existing DPV1 line with its FAA-required safety lights, the residential development off Pipeline Road, lights from camping on adjacent BLM-administered land, the lights along I-10, and the glow from development in Quartzsite.

KOP 30 – Copper Bottom Pass Road #1

KOP 30 (Appendix 1, Figure 3.18-42) is located south of Quartzsite, Arizona along the gravel road that travels west-northwest through Copper Bottom Pass, west of the intersection with Highway 95. The KOP represents the views of travelers on Copper Bottom Pass Road looking west-northwest, viewing Segments p-09 and p-10 on BLM-administered land designated VRM Class III. Segment p-09 is designated VRI Class II, comprised of scenic quality B and high sensitivity, within the foreground-middleground distance zone. Both segments are on BLM-administered land designated VRM Class II. Segment p-10 is designated VRI Class II and III, comprised of scenic quality B and high sensitivity, within the foreground-middleground distance zone. The view from KOP 30 is views flat desert plain with rugged mountains in the middleground to background enclosing the view. Exposed tan-gray earth in the foreground is stippled to coarse and rocky. Vegetation is very sparse in the immediate foreground, and is sparse green, dark green, and yellow-green, clumped and rounded with distance; becoming dense and uniform, forming a soft green horizontal line at the base of the mountains. The rugged tan, dark brown, and black mountains create a jagged and broken irregular horizontal line at the skyline. Tire tracks in the gravel road and other changes in texture create diagonal and curvilinear tan-gray banding. The monopole structures and DPV1 lattice structures create strong vertical and geometric repeated lines, but with slightly different intervals. The transmission line itself is horizontal and curvilinear. As travelers move through the landscape along the road, the utility structures become sky lined and visible, and attract more attention than the picture might otherwise indicate.

KOP 32 – Copper Canyon

KOP 32 (Appendix 1, Figure 3.18-43) is located in the Copper Bottom Pass area, west-southwest of Quartzsite, Arizona. The KOP represents the views of travelers on the gravel road through Copper Bottom Pass looking at Segments p-09, p-10, and cb-01 on BLM-administered land. Segments p-09 and p-10 are designated VRM Class III comprised of lands with high sensitivity in the foreground-middleground zone; however, p-09 has scenic quality C and B, while p-10 has scenic quality B. Segment cb-01 is designated VRM Class II and III, comprised of VRI Class II, scenic quality B and high sensitivity, within the foreground-middleground distance zone. Viewers are looking at the canyon bottom in the foreground enclosed by rugged mountains on either side, focusing the view on the middleground where the canyon opens up to the open desert plain with distant rugged blue-gray mountains at the skyline in the background. Horizontal to diagonal striations in the geology of the canyon walls converge at the mouth of the canyon emphasizing the focus on the distant views. Exposed tan-gray earth in the foreground is rocky to stippled. Native vegetation is dotted on the sides of the canyon, clumped in the foreground, becoming more uniform in the canyon bottom, in shades of green, dark green, and yellow-green. The rugged distant mountains create a short faint jagged horizontal line at the skyline. There are two existing power lines that are visible but not noticeable in the landscape from this KOP: a distribution line on monopoles delivering power to the communications site on Cunningham Peak and the DPV1 line on lattice structures. However, while driving along the gravel road, both the monopoles and lattice structures are more visible, obvious, and attract attention in a way that is not conveyed from this KOP. The KOP demonstrates how well the existing power infrastructure blends with the landscape under certain circumstances.

KOP 33 – Johnson Canyon

KOP 33 (Appendix 1, Figure 3.18-44) is located in Johnson Canyon in the Copper Bottom Pass area, west-southwest of Quartzsite, Arizona. The KOP represents the views of hikers and OHV recreationists looking at Segments cb-02 (which would be upslope to the left within the canyon) on BLM-administered land designated VRI Class II and III, comprised of scenic quality B and high sensitivity, within the foreground-middleground distance zone; and VRM Class II and III. Viewers are looking west-southwest at the enclosed landscape of the meandering canyon bottom in the foreground, enclosed by rugged mountains on either side, focusing the view where the canyon walls converge at the wash bottom. Landforms in the canyon are bold, angular, and somewhat conical. Repeated diagonal striations in the geology of the canyon walls and the diagonal slope lines point to the wash bottom, focusing the convergence. Exposed tan-gray earth in the foreground contains boulders and is rocky to stippled. Vegetation is dotted on the sides of the canyon, clumped in the foreground, punctuated by occasional saguaros, becoming more uniform with distance along the wash bottom, in shades of green, dark green, and yellow-green. The canyon walls form a sharp jagged horizontal line in the foreground-middleground. The wash bottom creates a light gray-tan irregular and indistinct curvilinear band. No development is visible, and despite the fact that the canyon is favored for OHV recreation, there are only minimally noticeable signs of use.

KOP 34 – Copper Bottom Alternatives Intersection

KOP 34 (Appendix 1, Figure 3.18-45) is located southwest of Quartzsite, Arizona, west of Copper Bottom Pass. The KOP represents the views of recreationists and backroad travelers looking east-northeast at the point where either Segment cb-01 or cb-02 would join with Segment cb-04 on BLM-administered land designated VRI Class II, comprised of scenic quality B and high sensitivity, within the foreground-middleground and seldom seen distance zones; and VRM Class II and III. The view from KOP 34 is enclosed by rugged angular pyramidal mountains in the foreground-middleground sloping down to the desert plain and lower angular rugged hills in the foreground. The rough and rocky to stippled wash bottom in the foreground is dotted with rounded shrubby green and yellow-green vegetation that becomes more uniform at the base of the mountains, and again becomes dotted on the hillsides. Occasional saguaros and ocotillos are visible and add to the diversity of vegetation. Vegetation at the base of the mountains forms a faint horizontal line that becomes sharp and distinct for a short distance at the horizon. The mountains create a jagged and undulating horizontal line at the horizon. A short segment of a rough two-track dirt road, along with rocks and vegetation along the wash create gently curvilinear gray-tan banding in the scene. Communication towers on top of Cunningham Peak are faintly visible as short thin vertical lines.

KOP 35 – Copper Bottom Pass Road #2

KOP 35 (Appendix 1, Figure 3.18-46) is located in the Copper Bottom Pass area, west-southwest of Quartzsite, Arizona. The KOP represents the views of travelers on the gravel road through Copper Bottom Pass looking at Segment p-11 on BLM-administered land designated VRI Class II and III, comprised of scenic quality B and high sensitivity, within the foreground-middleground and seldom seen distance zones; and VRM Class III. Viewers are looking at the canyon bottom in the foreground enclosed by rugged mountains on either side, focusing the view on the middleground where the canyon opens up to the open desert plain with distant rugged mountains at the skyline in the background. Diagonal striations in the geology of the canyon walls converge at the bottom of the canyon emphasizing the focus on the distant views. Exposed tan-gray earth in the foreground is rocky to stippled. Native vegetation is dotted on the sides of the canyon, sparsely clumped in the foreground, becoming more uniform in the canyon bottom, in shades of green, dark green, and yellow-green. The rugged distant mountains create a short faint jagged horizontal line at the skyline. The gravel road is visible as tan-gray curvilinear banding in the canyon bottom going into the distance. The existing DPV1 transmission line and lattice structures are noticeable in the foreground, and continue on down the canyon, but blend with the landscape to the point of being barely noticeable. However, while driving along the gravel road, the lattice structures are more visible, obvious, and attract attention in a way that is not fully conveyed from this KOP. The KOP helps to demonstrate how well the existing power infrastructure blends with the landscape under certain circumstances.

KOP 36 – Dome Rock Mountains

KOP 36 (Appendix 1, Figure 3.18-47) is located southwest of Quartzsite, Arizona, west of Copper Bottom Pass on Reclamation-managed public lands. The KOP represents the views of recreationists and backroad travelers looking north at Segment cb-05 or cb-06 on Reclamation-managed public lands. Segments cb-05 and 06 would both be on BLM-administered land that are comprised of scenic quality B and C, and moderate sensitivity; however, Segment cb-05 would be within the foreground-middleground and seldom seen distance zones and are VRI Class III and IV, and VRM Class II and III. Segment cb-06 would be within the foreground-middleground distance zone and designated VRI Class IV and VRM Class III. The view from KOP 36 is open and panoramic with flat desert plain in the foreground-middleground and low hills and rugged angular pyramidal mountains in the middleground and background. The gravely to stippled exposed earth in the foreground has clumped rounded shrubby green, yellow-green, and gray green vegetation that becomes more uniform with distance. Vegetation at the base of the low hills and mountains forms a distinct horizontal line. Another irregular horizontal line is created by light tan vegetation or exposed earth. The mountains create a jagged and undulating horizontal line at the skyline. Communication towers on top of Cunningham Peak are faintly visible as short thin vertical lines. Lattice structures of the DPV1 line are regularly spaced and faintly visible at the horizon in the distance. Rocks have been arranged to create a fire ring in the immediate foreground.

KOP 37 – Ehrenberg Cibola Road

KOP 37 (Appendix 1, Figure 3.18-48) is located southeast of Ehrenberg, Arizona, on BLM-administered land. The KOP represents the views of recreationists and backroad travelers looking south-southeast at Segments p-13 or cb-05 on BLM-administered land. Segment p-13 would be within lands designated VRI Class IV, comprised of scenic quality C and moderate sensitivity, within the foreground-middleground and seldom seen distance zones; and designated VRM Class III. Segment cb-05 would be on BLM-administered land that are VRI Class III and IV, comprised of scenic quality C and B, and moderate sensitivity, within the foreground-middleground and seldom seen distance zones; and designated VRM Class II and III. The view from KOP 37 is open and panoramic with flat desert plain in the immediate foreground, low hills in the foreground-middleground, and rugged angular pyramidal mountains in the background. The gravelly to stippled exposed earth in the foreground has sparse clumped rounded shrubby green and yellow-green vegetation that becomes dotted with distance. Vegetation at the low hills and mountains is not discernable. The mountains create a jagged and undulating horizontal line at the horizon. Lattice structures of the DPV1 line are regularly spaced geometric structures that attract attention in the foreground and run perpendicular to Ehrenberg Cibola Road. Transmission lines are soft horizontal curvilinear lines. The graded dirt road is visible in the foreground as a strong horizontal linear feature that disappears into the middleground. However, as it is simply bladed native materials, the color blends with the surrounding landscape. The road, tracks in the dirt, and shoulders create banding in shades of tan-gray. The associated fence line is faint in the foreground-middleground.

KOP 38 – Ehrenberg Wash

KOP 38 (Appendix 1, Figure 3.18-49) is located east-southeast of Ehrenberg, Arizona, in Ehrenberg Wash on Reclamation-managed public lands. The KOP represents the views of recreationists and backroad travelers looking south-southeast to southwest at Segment p-12 and Segment cb-06 or Segment cb-05 on BLM-administered land. Segments p-12 and cb-05 would be within lands designated VRI Class II, III, and IV; comprised of scenic quality C and B, and high sensitivity, within the foreground-middleground and seldom seen distance zones, and designated VRM Class III. Segment cb-06 would be on BLM-administered land that are VRI Class IV, comprised of scenic quality C and B, and moderate sensitivity, within the foreground-middleground distance zone; and designated VRM Class III. The view from KOP 38 is open and panoramic with flat desert plain in the foreground-middleground and hills and rugged angular pyramidal mountains in the background, which form a jagged line at the horizon. The gravely to stippled exposed earth in the immediate foreground is devoid of vegetation, transitioning to clumped rounded shrubby green, yellow-green, and gray green vegetation in the foreground that becomes dense and uniform with distance. Vegetation forms a broken and irregular horizontal line at the horizon west of the mountains. A diagonal line is created by a bladed road in the foreground. There are two yellow road signs visible in the foreground, one along the road and the other in the vegetation indicating the presence of another road. Lattice structures of the DPV1 line are regularly spaced and faintly visible in the foreground-middleground with transmission lines that form faint undulating horizontal lines.

KOP 39 – I-10 Hilltop

KOP 39 (Appendix 1, Figure 3.18-50) is located along the south side of I-10 west of Quartzsite, Arizona on CRIT lands. The KOP represents the views of drivers on I-10 looking northeast, who would be viewing Segment i-06 on CRIT Reservation lands. The view from KOP 39 is enclosed by the mountains in the foreground-middleground. Viewers are looking at the east-bound interstate and side slopes in the immediate foreground, with dark brown low hills and a rugged mountainous foreground-middleground, with one small area of gray-blue rugged mountains in the background as seen through a gap in the middleground mountains. The road is flat, low, and gray with a segment of gray, linear guardrail. A segment of the westbound road is visible beyond the guardrail in the middleground. It is a gray curving line that disappears into the mountains. Sparse green, yellow-green, and golden tan rounded shrubs dot the sides of the road and are sparse in the surrounding landscape. On the south side of I-10 there is a can dump that appears as a rust or dark brown swath. The hills and rugged mountains create a jagged and broken irregular horizontal line at the skyline. Brown fence posts create repeated short distinct vertical lines. A light tan area of disturbance that includes two dirt roads, one leading to a gas pipeline station is visible in the foreground at the foot of the hills. The disturbance is readily apparent in contrast with the darker brown hills and mountains.

KOP 40 – I-10 Rest Area West

KOP 40 (Appendix 1, Figure 3.18-51) is located at an eastbound rest area along I-10 west of Quartzsite and east of Ehrenberg on Reclamation-managed public land. The KOP represents the views of eastbound I-10 travelers stopped at the rest area looking south-southwest at Segment i-07, which would be located on Reclamation-administered lands. The view from KOP 40 is open and mostly panoramic, partially enclosed at the KOP point by rest area development. The KOP has views of rugged blue-gray mountains faintly noted in the background. Viewers are looking at a flat, wide desert valley floor that slopes abruptly into a drainage in the foreground; lumpy, jagged, angular, mountains are present in part of very distant background. The light tan and flat desert plain in the middleground appears moderately vegetated. Vegetation includes shades of green, pale green, dark green, dark brown, and tan, mostly clumped and wispy, that becomes more dotted and indistinct with distance. A subtle horizontal line is created where the desert plain meets the base of the mountains while it is abrupt where the plain meets the sky. The rest area patio wall in the foreground creates a strong horizontal gray line that breaks the reddish patio in the immediate foreground from the vegetation in the desert plain. The groomed native surface in the rest area creates a light tan area in the foreground. Other developments in the rest area are geometric structures and facilities; trash cans, cigarette ash trays, lamp posts, fence posts, handrails, and signs introduce short vertical and horizontal lines. Trees and other vegetation in the rest area appear similar to native vegetation that is scraggly. The I-10 off ramp road is visible through breaks in the development. Lattice structures of the DPV1 transmission line are faintly visible in the middleground.

I-10 Linear KOP

Traveling westbound along I-10 through the Copper Bottom Zone west of Quartzsite, views are enclosed to the north and south by the rugged and scenic Dome Rock Mountains. Emerging from the Dome Rock Mountains to the west, the scene opens up and becomes panoramic, offering views of the west side of the Dome Rock Mountains and the Desert Plain to the west, approaching the Colorado River. There is an exit off the Highway with a truck stop on the north side of the Highway. When traveling east on I-10 through the Copper Bottom Zone, viewers can look southeast up Copper Bottom Pass and see the DPV1 transmission line emerging from and approaching the Highway, before diverging from the highway and fading into the distance. Westbound travelers see the DPV1 approaching and diverging from the Highway, but because of the angle of view, cannot easily see up the Pass. This area is also used for dispersed camping and may be dotted with individual or groups of RVs during the heavy visitor use season.

KOP points representing the views of travelers on I-10 in the Copper Bottom Zone include KOPs 39 and 40.

3.18.3.7 Colorado River and California Zone

Zone Overview

The Colorado River and California Zone contains all segments that would impact the Colorado River or be in California. East of the Colorado River, the zone includes bluffs above the river and west of the river is the floodplain, which is in California. West of the river, the floodplain is private land that is irrigated and cultivated for a variety of agriculture. The portion of the zone around the Colorado River is scenic and contains residential developments. The western end of the zone is

BLM-administered land that are flat desert plain with deep sands between the Mule Mountains to the South and the McCoy Mountains to the north. Native vegetation in this portion of the desert plain is very sparse and homogenous, which does not contribute to scenic values in the area. The main transportation route through the zone is I-10, while numerous gravel and hardened surface local routes crisscross the agricultural floodplain, which appears rural and pastoral. The area offers broken views of distant rugged mountains in all directions from the zone. Visible development in the area includes a gas pipeline crossing the river, the City of Blythe, the Blythe Airport west of Blythe, the town of Ripley south of Blythe, the DPV1 transmission line, the Colorado River Substation, a power plant, a solar generating facility, gen-tie lines, and numerous other transmission lines connecting to the substation. Other development in Blythe is concentrated at the I-10 exits and along the main route through town, including gas stations, fast food, restaurants, lodging, and other community services. Also notable are proposals for development of new solar generating facilities east of, west of, and surrounding the Colorado River Substation. The largest number of sensitive viewers in the zone is travelers on I-10, along with residents and workers in the Blythe and Ripley areas.

For the portion of the Proposed Action in the Colorado River and California Zone, the VRI classification (Appendix 1, Figure 3.18-1) is Class II adjacent to the Colorado River and Class III for the remainder of the zone. Scenic quality (Appendix 1, Figure 3.18-2) has been rated as A adjacent to the Colorado River and as B for the remainder of the zone. Viewer sensitivity (Appendix 1, Figure 3.18-3) is high adjacent to the Colorado River and moderate for the remainder of the zone. Alternative segments are generally the same. VRM classification (Appendix 1, Figure 3.18-52) for this zone is Class IV for BLM-administered land that have designated VRM classifications. Several segments would be partially or completely within BLM-designated utility corridors.

All segments within the Colorado River and California Zone would be in the foreground-middleground distance zone. Table 3.18-5 summarizes segment information for Colorado River and California Zone.

Table 3.18-5 Segment Summary for the Colorado River and California Zone

SEGMENT	SCENIC QUALITY	SENSITIVITY	DISTANCE ZONE	VRI CLASS	VRM CLASS
PROPOSED ACTION					
p-15e	C and A	Moderate and High	Foreground-middleground	II, IV	III
p-15w	N/A	N/A	N/A	III	N/A
p-16	B	High	N/A	II	N/A
p-17	B	High	Foreground-middleground	II	III, IV
p-18	B	High	Foreground-middleground	II	IV
ALTERNATIVE SEGMENTS					
ca-01	N/A	N/A	N/A	III	N/A
ca-02	B	High	Foreground-middleground	II	IV

SEGMENT	SCENIC QUALITY	SENSITIVITY	DISTANCE ZONE	VRI CLASS	VRM CLASS
ca-04	N/A	N/A	N/A	II, III	N/A
ca-05	N/A	N/A	N/A	III	N/A
ca-06	B	High	Foreground-middleground	II	IV
ca-07	B	High	Foreground-middleground	II	IV
ca-09	B	High	Foreground-middleground	II	IV
cb-10	B	High	Foreground-middleground	II, IV	III
i-08s	N/A	N/A	N/A	II, III, IV	N/A
x-09	N/A	N/A	N/A	III	N/A
x-10	N/A	N/A	N/A	III	N/A
x-11	N/A	N/A	N/A	II, III	N/A
x-12	N/A	N/A	N/A	N/A	N/A
x-13	N/A	N/A	N/A	N/A	N/A
x-15	B	High	Foreground-middleground	II	IV
x-16	B	High	Foreground-middleground	II	IV
x-19	B	High	Foreground-middleground	II	IV

Scenic Quality categories: A = High, B = Medium, C = Low

VRI classes: I = areas where the current management situation requires maintaining a natural environment essentially unaltered by man, II/III/IV = based on combinations of scenic quality, sensitivity levels, and distance zones as displayed in Table 3.18-5.

VRM classes: I = Objective is to preserve the existing character of the landscape. Provides for natural ecological changes; but does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

II = Objective is to retain the existing character of the landscape. Level of change to the characteristic landscape should be low. Management activities may be seen but should not attract attention of the casual observer. Changes must repeat the basic elements found in the predominant natural features of the characteristic landscape.

III = Objective is to partially retain existing character of the landscape. Level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

IV = Objective is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. Any action necessary to prevent unnecessary and undue degradation to the land is to be taken, such as, but not limited to, careful location, minimal disturbance, and repeating the basic elements.

Notes: If more than one value applies to a segment, the highest or most conservative value was applied.

N/A indicates that the segment does not lie on BLM land or that a value was not applied to that segment by the BLM.

Sources of nighttime light and glare in this zone include the existing DPV1 line with its FAA-required safety lights; the lights along I-10; lights associated with the city of Blythe and surrounding rural communities with rural residential and commercial development; and the Colorado River Substation.

KOP 41 – Colorado River Crossing

KOP 41 (Appendix 1, Figure 3.18-53) is located on the east side of the Colorado River on private property in Ehrenberg, Arizona. The KOP represents the views of travelers on I-10 looking south-southwest who would be viewing Segments i-08s on Reclamation-managed public land or Arizona state trust land; or ca-04 on private property in California. The view from KOP 41 is open with a minor degree of urban development. Viewers are looking at developed, disturbed valley floor bisected by the Colorado River. The foreground includes a large, square-shaped area of gravels and soils and a low, flat terrace of soils adjacent to the river. There is a gravel berm at edge of bare area in foreground. The river is an irregular reflective form that is dominant. An abrupt line is created where the disturbed gravel area meets the river terrace. Vegetation forms include rounded clumps of low shrubs, tall spikey grass clumps along river's edge, tall rounded shrubs, and tall, vertical tree trunks with rounded clumps of foliage. The trees create an undulating and irregular horizontal line at the skyline. Vegetation is a mix of native and non-native urban plantings. Rows of taller trees and shrubs on the opposite side of river create a dense strip of vegetation cover parallel with the river. In the distant foreground, power poles, a communication tower, power lines, and light poles are faintly visible as vertical and horizontal elements with heights comparable to trees. Dominant in the foreground is the pipeline suspension crossing with very tall, vertical red and white painted structures and horizontal white pipeline and gray, curving suspension cables. The associated pipeline station and chain link fence are low and horizontal. The I-10 bridge crossing the river has a horizontal rectangular shape. Buildings, houses, and RV facilities on opposite side of river, in the middleground, have small square and rectangular forms that are not dominant.

KOP 42 – Colorado River Corridor

KOP 42 (Appendix 1, Figure 3.18-54) is located on private property near a small residential area southwest of the I-10 Colorado River crossing on the eastern outskirts of Blythe, California. The KOP represents the views of residents looking southeast who would be viewing segment ca-04 and x-09, which would also be located on private property. The view from KOP 42 is open and panoramic. Viewers are looking at expansive, flat desert in the foreground-middleground gently rising to the distant middleground, with tops of rugged mountains visible in the background. A strong horizontal line is created where the tan desert meets the base of the brown-gray mountains in the distance. Native vegetation in shades of green, pale green, sage-green dark green, and gray is complex and clumped with areas of tan exposed soils in the foreground-middleground. Dirt roads are evident by lack of vegetation in linear swaths and slight rutting depressions from use. The rugged mountains in the background create a broken irregular horizontal line at the skyline. The dark brown, single wood power poles create a series of repeated strong vertical lines that fade into the distance. The associated powerlines are evident as diagonal and undulating. Blocky buildings are a small part of the scene, visible in the distant foreground-middleground, colored light tan that blends well with surrounding vegetation.

KOP 43 – Riviera Drive West Side of Colorado River

KOP 43 (Appendix 1, Figure 3.18-55) is located on private property in an agricultural area south of I-10 on the west side of the Colorado River. The KOP represents the views of residents looking west-southwest who would be viewing Segments x-10, x-11, or ca-01, all of which would be on private property. The view from KOP 43 is open and panoramic. Viewers are looking at expansive, flat agricultural fields west of Riviera Drive in the foreground-middleground, with more native vegetation in the foreground in broad disturbed areas around the residence. There are rugged blue gray mountains in the distant background. A strong horizontal line is created where the bright green of the agricultural fields meets a tan band of native soils in the foreground and at the base of the blue-gray mountains in the distance. Native vegetation is rounded and sparse, pale green and tan shrubs. The rugged mountains in the background create a jagged and broken irregular horizontal line at the skyline. A single wood power pole, wood and chain link fence posts, and the greenhouse structure frame create a series of repeated vertical lines across the view. The gray house and small white shed are blocky elements in the foreground. Agricultural buildings in the distance appear as small white geometric elements. The DPV1 lattice transmission structures on the Arizona side of the river and H-frame structures on the California side of the river are faintly visible, evenly spaced, and geometric.

KOP 44 – Oxbow Road - Colorado River Crossing

KOP 44 (Appendix 1, Figure 3.18-56) is located on the east side of the Colorado River on Reclamation-managed public land south of Ehrenberg, Arizona. The KOP represents the views of travelers on Oxbow Road looking south-southwest, who would be viewing Segments p-15e or cb-10 on Arizona state trust land; p-15w, or x-11 on private land. The view from KOP 44 is partially enclosed to panoramic and mostly natural. Viewers are looking at terrain bisected by the Colorado River. The foreground includes a rectangular, linear graveled road adjacent to the east side of the river. The river is an irregular reflective form that is dominant. An abrupt line and tan-gray banding are created by the road. Beyond the road in the distant foreground is a domed hill and a lower row of uniform hills that step down to valley floor. Vegetation forms include wispy and wiry shrubs in the foreground, becoming smoother, rounded, and clumped in the distant foreground-middleground. Vegetation colors include dark green, green, pale green, brown, tan, and gray. There is one prominent sphere-like tree in the middleground that creates somewhat of a visual focus. Shrubs create an undulating and irregular horizontal line at the skyline to one side, while terrain creates a smooth undulating line at the skyline on the other side. An undulating mountain range is barely discernable in the center of the background. Mountain ranges in the background are so remote that they are lower than middleground vegetation. The background is barely discernable. In the middleground, lattice structures are faintly visible as vertical geometric elements with horizontal curvilinear transmission lines.

KOP 45 – McIntyre County Park

KOP 45 (Appendix 1, Figure 3.18-57) is located on the west side of the Colorado River on county property (McIntyre County Park) south of Blythe, California. The KOP represents the views of park visitors/recreationists looking northeast who would be viewing Segments p-15e on Arizona state trust land and p-15w on private land, as well as the existing DPV1 line. The view from KOP 45 is panoramic and mostly natural. In the foreground, the vegetation consists of maintained and mowed grasses with shade trees. Beyond the grass, viewers are looking at terrain across the Colorado River. The terrain is flat, open valley floor that gently slopes towards the river. The river is smooth and linear but does not dominant the view; however, it does create a transition line partially screened by foreground terrain. The middleground includes a horizontal striated rock outcropping/formation mostly absent of vegetation. This is in contrast to the valley floor that is fairly densely covered in vegetation in the foreground-middleground. Vegetation forms are rounded to mostly uniform in the distant foreground-middleground, while the grass in the foreground is flat and smooth. Vegetation colors include light green, bright green, yellow-green, and brown. There is one prominent sphere-like tree in the foreground. Shrubs create a slightly undulating horizontal line at the skyline. Gray/brown undulating mountain ranges are barely discernable in portions of the distant background, creating a jagged irregular line at the skyline. In the foreground white painted and plain brown wood fence posts provide repeated vertical elements and separate the lawn from a native surface dirt road and an agricultural field. The reddish-tan soils in the road contrast with the bright green of the park grasses and the agricultural field beyond. Additional foreground elements include gray, white, dark brown, and gray brown geometric shapes of an RV, RV shelter and deck, and electrical panels. Steel posts painted yellow add short vertical elements around the electrical panels.

There is a single, tall, thin, metal light post in line with the fence posts. Across the river, a light gray graveled road appears as a rectangular/linear break in the native vegetation. Farther out in the middleground, lattice and H-frame structures of the DPV1 line are faintly visible as small vertical elements with the transmission line itself faintly horizontal curvilinear.

KOP 47 – Appleby Elementary School

KOP 47 (Appendix 1, Figure 3.18-58) is located on east Vernon Avenue at the northeast corner of Appleby Elementary School in southern Blythe, California. The KOP represents the views of residents, school children, and visitors to the school looking south who would be viewing Segments ca-05, ca-01, or p-15w, all of which would be on private property. The view from KOP 47 is open and panoramic but views to the southwest are blocked by the school. Viewers are looking at expansive, flat agricultural fields south of east Vernon Avenue, with a prominent row of shade and palm trees at the horizon in the distant foreground, and faint rugged blue-gray mountainous creating a jagged horizontal line at the skyline in the background. A strong horizontal line is created where the bright green of the agricultural fields meets the base of the blue-gray mountains in the distance. The paved road and shoulders along the east side of the road creates strong vertical and diagonal gray and brown banded lines from the foreground to the middleground. Numerous short vertical lines in the fencing and school structures are repeated regularly and irregularly, while the roofline and gutters create strong horizontal and diagonal lines. The paved surface of the play area creates an oval that is somewhat repeated in the rounded play equipment, while other play equipment appears as a jumble of colors and lines. Other buildings in the distant foreground-middleground are dotted white with rectangular and angular elements, further emphasizing the horizontal line at the base of the mountains. The palm trees and clustered trees provide somewhat regularly spaced short vertical lines that attract attention. Distant monopole transmission structures are regularly spaced and faintly visible.

KOP 48 – Miller Park

KOP 48 (Appendix 1, Figure 3.18-59) is located along south Lovekin Boulevard on the west side of Miller Park in southern Blythe, California. The KOP represents the south views of travelers on Lovekin Boulevard and users of Miller Park looking south who would be viewing Segments ca-

05, ca-01, or p-15w, all of which would be on private land. The view from KOP 48 is urban industrial and somewhat enclosed by buildings and trees, that opens to agricultural lands south of town. Viewers are looking at the south end of Miller Park with shade trees, picnic tables and grass, large metal industrial buildings, and smaller dilapidated buildings. A subtle horizontal line is created where the open agricultural lands are visible southwest of Lovekin Boulevard at the horizon. Shade trees create a series of somewhat regularly spaced vertical lines along the edge of the park, which repeat vertical lines created by road signs, monopole power poles, fence posts, and a baseball backstop. Distant clumped vegetation is visible as light green at the horizon. Undulating power lines create horizontal to diagonal lines. Crack sealing of Lovekin Boulevard creates a maze of dark gray and black lines in the gray road surface. The sidewalk and yellow lines in the road repeat the diagonal lines of the road surface. Shade from the trees creates irregularly repeated horizontal shadow lines on the road surface going into the distant foreground.

KOP 49 – Intersection of Seeley and Lovekin Boulevard

KOP 49 (Appendix 1, Figure 3.18-60) is located on private property in an agricultural area south of I-10 and Blythe, California. The KOP represents the views of travelers on Seeley and Lovekin looking south who would be viewing Segments ca-05, ca-01, or p-15w, all on private land. The view from KOP 49 is open and panoramic. Viewers are looking at an industrial building, gas and convenience store, and associated parking, surrounded by green and tan agricultural fields stacks of hay, other agricultural structures, and a few residences. Intervening development and vegetation mostly obscure the horizon; however, a broken horizontal line is visible on the periphery, which is created where the bright green of the agricultural fields meets a tan band of other fields and the base of the blue-gray mountains in the distance. Shade and palm trees dot the landscape in the distant foreground-middleground at the horizon, while the rugged mountains in the background create a jagged and broken irregular horizontal line at the skyline. Lattice and H-frame transmission structures are present in the middleground between other closer development but do not attract attention. Various structures and stacks of hay create low horizontal, blocky, and angular lines that, along with associated vehicles and equipment, give the intersection a busy feel. Single power poles and light poles along with shorter sign posts introduce noticeable tall slender vertical elements in a landscape that generally has a low, expansive, horizontal feel.

KOP 50 – 18th Avenue Houses Looking North-Northeast

KOP 50 is located on private property in an agricultural area south of I-10 and Blythe, California. The KOP represents the views of travelers and residents on 18th Avenue looking north-northeast (Appendix 1, Figure 3.18-61a) who would be viewing Segment ca-05; and looking south-southeast (Appendix 1, 3.18-61b) who would be viewing Segment ca-01 or p-15w; all of which would be on private land. The view from KOP 50 is open and panoramic. Viewers are looking across cultivated fields at a green horizontal line of low shade trees and other vegetation, that blends with agricultural structures and a few residences to the west. This creates an irregular horizontal line and the blue-gray rugged mountains in the distance create a jagged and broken horizontal line. A cluster of shade trees surrounding a residence in the foreground to the east on 18th Avenue and other shade trees looking down the road partially block views of distant mountains. Regularly spaced single power poles introduce short vertical lines that are visible but are not noticeable. Looking south-southeast, regularly spaced DPV1 H-frame transmission structures and additional single power poles add a series of short vertical lines, connected by horizontal curvilinear lines of the transmission lines, faintly visible. Various agricultural and residential structures create low horizontal, blocky, and angular lines that give the view to the northwest a rural development feel. Overall, the scene is predominantly low and horizontal, rural agricultural, with an element of rural residential development.

KOP 51 – 22nd and Lovekin Residence

KOP 51 is located on private property near the intersection of 22nd Avenue and Lovekin Boulevard in an agricultural area south Blythe, California. The KOP represents the views of residents and travelers on Lovekin Boulevard looking north who would be viewing Segment ca-01 (Appendix 1, Figure 3.18-62a) or looking south who would be viewing Segment p-15w (Appendix 1, Figure 3.18-62b), both of which would be on private land. The view from KOP 51 is panoramic but is enclosed by residences and shade trees. Viewers are looking north and south along Lovekin Boulevard, which is bordered on either side by cultivated fields with separated residences along Lovekin. Regularly spaced single power poles along Lovekin introduce a series of vertical lines that extend to the north down the road. The strong diagonal lines of Lovekin Boulevard are accentuated by the lines in the dirt along the road shoulders, which along with the power poles focuses the viewers' attention looking down the road. There is a distinct but broken green horizontal line of low shade trees and other vegetation at the skyline that blends with dotted white structures looking across the cultivated field. The blue-gray rugged mountains in the background create a jagged and broken horizontal line. Clusters of shade trees surrounding residences in the foreground on Lovekin Boulevard partially block views of distant mountains. Residences and other structures appear angular, cubical, and blocky. Various agricultural and residential structures create low horizontal, blocky, and angular lines that give the foreground view a lightly developed feel. Overall, the scene is predominantly low and horizontal, rural agricultural, with an element of rural residential development.

KOP 52 – Intersection of I-10 and Neighbours Boulevard

KOP 52 (Appendix 1, Figure 3.18-63) is located on private property near the intersection of I-10 and Neighbours Boulevard west of Blythe, California. The KOP represents the views of residents and travelers on Neighbours Boulevard looking south-southeast who would be viewing Segments ca-05, ca-01, or p-15w, all on private land. The view from KOP 52 is open and panoramic. Viewers are looking south along Neighbours Boulevard, which is bordered on either side by cultivated fields with separated residences. Regularly spaced single power poles along Neighbours Boulevard introduce a series of vertical lines looking south down the road that are connected by faintly visible curvilinear horizontal lines. Diagonal lines of Neighbours Boulevard and road striping, which along with the power poles focuses the viewers' attention looking down the road. Competing for attention is the canal in the immediate foreground, which creates strong horizontal lines where the water meets the canal bank and light tan banding where a dirt two-track follows the canal bank. There is a distinct but broken green and tan horizontal lines of agricultural fields, low shade trees, and other vegetation that blends with dotted white structures looking across the cultivated field to the southeast. The blue-gray rugged mountains in the background create a very broken jagged horizontal line. Native vegetation along the canal bank is clumped and rounded, with rows of darker green shade trees visible along the road and at the horizon. Residences and other structures appear angular, cubical, and blocky. H-frame structures of the DPV1 transmission line are faintly visible in the distant foreground, visible as regularly spaced vertical lines. Various agricultural and residential structures create low horizontal, blocky, and angular lines that give the foreground view a lightly developed feel. Overall, the scene is predominantly low and horizontal, rural agricultural, with an element of rural residential development.

KOP 53 – Ripley

KOP 53 (Appendix 1, Figure 3.18-64) is located on private property near the intersection of 24th Avenue and Neighbours Boulevard on the northern edge of Ripley, California. The KOP represents the views of residents and travelers on Neighbours Boulevard looking north-northeast who would be viewing Segment p-15w on private land. The view from KOP 53 is enclosed by residences and shade trees to the northwest, directing the view toward the open agricultural fields and DPV1 Transmission Line. Viewers are looking north-northeast from the intersection, across cultivated fields with residences on the west side of Neighbours Boulevard. Regularly spaced single power poles along 24th Avenue introduce a series of vertical lines looking east down the road. The diagonal lines of 24th Avenue and Neighbours Boulevard are accentuated by the soil berms along the road shoulders, which along with the power poles draws the viewers' attention looking down the roads. There is a distinct but broken green horizontal line of low shade trees and other vegetation that blends with dotted white structures looking across the cultivated field to the northeast. The blue-gray rugged mountains in the background create a jagged and broken horizontal line. Clusters of shade trees surrounding residences in the foreground on Neighbours Boulevard partially block views of distant mountains. Residences and other structures appear angular, cubical, and blocky. Various agricultural and residential structures create low horizontal, blocky, and angular lines that give the foreground view a feeling of rural agricultural development. Clearly visible regularly spaced DPV1 H-frame transmission structures add a series of short vertical lines; however, their large relative size is evident in the landscape. The DPV1 structures are connected by horizontal curvilinear lines of the transmission lines, that are faintly visible. Sign posts, fence posts, and highway delineators create short vertical lines that irregularly repeat the vertical lines of the H-frame structures and single power poles. Overall, the scene is predominantly low and horizontal, rural agricultural, with an element of rural residential development.

KOP 54 – Mesa Verde Community

KOP 54 (Appendix 1, Figure 3.18-65) is located on private property south of the of I-10 on Mesa Drive at the southern end of the Mesa Verde community west of Blythe, California. The KOP represents the views of residents of the Mesa Verde community from the southern edges of the development looking south at Segment ca-07, which would be on a combination of private and BLM-administered land designated VRI Class II, comprised of scenic quality B with high visual sensitivity, and designated VRM Class III. The view from KOP 54 is mostly open and panoramic but becomes enclosed by dense vegetation to the west-southwest. Viewers are looking at desert plain with distant angular jagged mountains that are faintly visible in the background. Vegetation in the immediate foreground is sparse, clumped, and rounded yellow-green, becoming uniform with distance to create a distinct yellow-green line at the horizon. The faintly visible blue-gray mountains create a broken and jagged horizontal line. Tire tracks and two tracks in the finely textured red-tan exposed earth in the foreground create myriad soft horizontal lines. Short vertical lines of the existing DPV1 H-frame structures are visible at the horizon, with faintly visible undulating horizontal transmission lines. Monopole transmission structures and associated lines are also visible along with one single power pole.

KOP 55 – I-10 Communications Site

KOP 55 (Appendix 1, Figure 3.18-66) is located on a butte on private property near a communications site north of the of I-10 west of the Blythe, California airport. The KOP provides a comprehensive superior view of the area and existing development south and southwest of the Blythe airport, looking south-southwest at Segment ca-07, which would be on a combination of private and BLM-administered land designated VRI Class II, comprised of scenic quality B with high visual sensitivity, and designated VRM Class III. The view from KOP 55 is open and panoramic. Viewers are looking at desert plain in the foreground-middleground with distant angular jagged mountains visible in the middleground and background. Small clumped vegetation dots the landscape and a narrow band of larger and denser vegetation is visible as a horizontal line in the distant foreground. The faintly visible blue-gray mountains form an irregular horizontal line at the skyline, while the desert plain forms a distinct tan horizontal line at the base of the mountains. The twin parallel gray paved surfaces of I-10 dotted with vehicles and the associated shoulders create strong diagonal lines that take the viewers' eyes toward the west as the lines diminish with distance. Numerous H-frame, monopole transmission facilities, and monopole distribution lines are scattered in the foreground-middleground creating short vertical lines that are sometimes regularly spaced and repeated. The DPV1 H-frame structures are faintly visible in the middleground but are not distinguishable from other transmission development.

KOP 56 – I-10 North of Colorado River Substation

KOP 56 (Appendix 1, Figure 3.18-67) is located along I-10 north of the Colorado River Substation and west of the Blythe, California airport. The KOP represents the views of travelers along I-10 looking south at Segments ca-09 and x-19, which would be on a combination of private land and BLM-administered land designated VRI Class II, comprised of scenic quality B with high visual sensitivity, and designated VRM Class III, except a portion of x-19 would be VRM Class II. The view from KOP 56 is open and panoramic. Viewers are looking at desert plain in the foreground-middleground with distant angular jagged mountains visible in the middleground and background. Small clumped vegetation dots the landscape, becoming somewhat uniform with distance to form a yellow-brown-green horizontal line in the distant foreground-middleground. Lighter tan desert plain forms another horizontal line behind the vegetation at the base of the mountains. The blue-gray mountains create a broken and jagged horizontal line fading into the distance to the west. The gray paved surface of I-10 creates strong horizontal lines that take the viewers' eyes toward the west. Numerous H-frame, monopole transmission facilities and monopole distribution lines are scattered in the distant foreground-middleground creating short vertical lines that are sometimes regularly spaced and repeated. The Colorado River Substation appears as a dense concentration of vertical lines. The DPV1 H-frame structures are faintly visible in the middleground but are not distinguishable from other transmission development.

I-10 Linear KOP

Westbound travelers on I-10 see the desert plain transitioning to agricultural areas and riparian vegetation approaching Ehrenberg and the Colorado River. At Ehrenberg, there is an exit with commercial businesses and access to the east side of the Colorado River. Travelers crossing the Colorado River looking south see residential and commercial development along the banks of the river, and a pipeline bridge also crossing the river. Once across the river, looking south the view is of the river floodplain that is developed for agriculture. Traveling through the City of Blythe is similar to Quartzsite in that the Highway is rimmed with fast food establishments, restaurants, gas stations, truck stops, lodging, and residential areas; however, the backdrop to the City is mostly agricultural with distant mountain views.

West of the City development, the agricultural plain rises to desert bluffs, that become desert plain. Development becomes more industrial in nature, with views of the Blythe Airport, a power plant, a solar generating facility, and several transmission lines leading to the Colorado River Substation. Just south of the Highway and Airport is the small residential community of Nichols Warm Springs. The Colorado River Substation comes into view approximately 1 mile south of the Highway, along with numerous gen-tie and transmission lines. The DPV1 Transmission line can be seen distantly approaching the substation.

Because the Proposed Action would be approximately 6 miles south of the Highway, and the majority of Alternative Segments would be a few miles south of the Highway, KOPs were mainly established to view the Colorado River Substation area. Therefore, KOP points representing the views of travelers along I-10 include KOPs 55 and 56.

3.19 WATER RESOURCES (SURFACE AND GROUNDWATER)

3.19.1 Applicable Laws, Regulations, Policies, and Plans

For context, the following sections list the Federal and state laws, regulations, and standards that govern water resources in the Project Area. Those laws, regulations, and standards that are most relevant are described in detail.

3.19.1.1 Federal

- **Clean Water Act (Public Law 95-217):** Waters of the US (WOUS), including wetlands, are subject to the USACE jurisdiction under Section 404 of the Clean Water Act (CWA). The USACE requires a Section 404 permit for the discharge of dredged or fill material into WOUS. The Los Angeles District of the USACE would provide review and permitting services for the Project. Pursuant to Section 401 of the CWA, a water quality certification is required if a Federal agency proposes to permit a discharge into WOUS, to ensure such discharge does not violate state water quality standards.
- **Rivers and Harbors Appropriation Act of 1899 (33 USC 403):** Under Section 10 of the Rivers and Harbors Act, the building of wharfs, jetties, and other structures within or over navigable waters requires Congressional approval. Excavation or fill within navigable waters requires the approval of the Chief of Engineers of the USACE.
- **Protection of Wetlands (EO 11990, May 24, 1977):** EO 11990 sets forth policy to avoid, to the extent possible, adverse impacts associated with the destruction or modification of wetlands and to limit Federal support of new construction in wetlands wherever there is a practicable non-wetland alternative.
- **Federal Water Pollution Control Act (33 USC 1251 et seq.):** The Federal Water Pollution Control Act of 1972 established Federal regulation of the nation's waters and contains provisions designed to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The Act provides requirements that limitations be

determined for point sources that are consistent with state water quality standards and sets procedures for state issuance of water quality standards.

- **National Pollutant Discharge Elimination System (NPDES):** The NPDES Permit Program controls water pollution by regulating point sources that discharge pollutants into WOUS. The program allows the EPA to regulate discharges into the nation's waters by setting limits on the effluent that can be introduced into a body of water from an operating and permitted facility.
- **Oil Pollution Act (33 USC 2701 et seq.):** The Oil Pollution Act of 1990 outlines the prevention, response, liability, and compensation rules to deal with vessel and facility caused oil pollution into WOUS. The Act requires the development of Area Contingency Plans to prepare and plan for oil spill response.
- **Safe Drinking Water Act (42 USC 300h):** The Safe Drinking Water Act sets Federal standards to protect all waters intended for drinking use, regardless of whether in the form of surface water or groundwater.
- **Water Quality Act (PL 100-4):** The Water Quality Act of 1965 was implemented to prevent water pollution, to order states to develop water quality standards that are subject to Federal review, and to develop plans to meet those standards.
- **Water Resources Planning Act [42 USC 1962a - 1962(a)(4)(e)]:** The Water Resources Planning Act of 1965 established requirements for Federal and regional coordination in the development and implementation of plans for water resource development. The Act sets forth a plan to maintain a continuing assessment of the adequacy of water supplies in each region of the US
- **Water Rights Act (43 USC 666):** The Water Rights Act allows judicial adjudication of Federal reserved water rights in state court. The adjudication must include all water rights in a basin, including all claimed Federal reserved water rights and all state administered water rights.
- **Flood Control Act (16 USC 460d et seq.):** The Flood Control Act of 1944 limits the authorization and construction of USACE water development projects related to navigation, flood control, and other water projects to those having significant benefits for navigation and which could be operated consistent with other river uses.
- **Flood Disaster Protection Act:** The Flood Disaster Protection Act of 1973 requires that flood insurance be mandatory for the protection of property located in Special Flood Hazard Areas.
- **Floodplain Management (EO 11988, May 24, 1977):** EO 11988 requires that Federal agencies avoid, to the extent possible, adverse impacts associated with development or modification of floodplains and limits Federal support of floodplain development wherever there is a practicable alternative. EO 11988 directs Federal agencies, and the activities undertaken or authorized by them, to reduce the risk of flood loss and to minimize flood impacts on human safety, health, and welfare.
- **Colorado River Basin Project Act (43 USC 1501-1556):** The Colorado River Basin Project Act of 1968 provided a program for the comprehensive development of the water

resources of the Colorado River Basin and serves as the framework for state and Federal agency coordination under which projects in the basin are constructed.

- **Colorado River Basin Salinity Control Act (43 USC 1571-1599):** The Colorado River Basin Salinity Control Act of 1974 established a program to control salinity concentrations in the Colorado River and its tributaries. Pursuant to this Act, Federal agencies may require the Project to reduce erosion and sediment transport by using best management practices and incorporating terms, conditions, and stipulations into land use authorizations.
- **Colorado River Floodway Protection Act (100 Stat. 1129):** The Colorado River Floodway Protection Act of 1986 established the Colorado River Floodway and withdrew Federal flood insurance for projects constructed in flood prone areas unless the structures meet certain requirements. The Act also denies the granting of Federal leases on land located in the floodway unless it is determined that the proposed use of such land is consistent with the purposes of the Act.
- **Colorado River Storage Project Act (43 USC 620):** The Colorado River Storage Project Act of 1956 authorized the construction of a variety of dams, power plants, reservoirs, and related works. The Act requires projects to investigate, plan, construct, and operate facilities to mitigate losses of and improve conditions for fish and wildlife and public recreational facilities.

3.19.1.2 State

Arizona

- **ARS (Title 45 – Waters):** ARS Title 45 outlines the statutes and responsibilities for water planning and regulation as administered by the Arizona Department of Water Resources (ADWR).
- **Aquifer Water Quality Standards (AAC R18-11 Article 4):** The Aquifer Water Quality Standards establish the water quality goals for groundwater in Arizona, which is to maintain and protect groundwater quality for drinking water use.
- **Surface water quality standards (AAC R18-11 Article 1):** The surface water quality standards include the Arizona regulations or rules that protect lakes, rivers, streams, and other surface water bodies from pollution.
- **Arizona Pollution Discharge Elimination System (AAC R18-9 Article 9):** The Arizona Pollution Discharge Elimination System requires all facilities that discharge pollutants from any point source into WOUS to obtain or seek coverage under a General or Individual Permit. The General Construction Stormwater Permit is administered by the ADEQ. On tribal lands in Arizona, the NPDES is administered by the EPA.

California

- **Porter-Cologne Water Quality Control Act:** The Porter-Cologne Water Quality Control Act of 1969 defines the allowable limits or levels of water quality constituents or characteristics that are established for the reasonable protection of beneficial uses of water or the prevention of nuisance in a specific area. The Act identifies water quality objectives that are intended to protect the public health and welfare, and to maintain or enhance water quality in relation to the existing and/or potential beneficial uses of the water. Water quality objectives apply to both WOUS and California designated waters of the state.

- **California State Non-degradation Policy:** The California State Non-degradation Policy of 1968 applies to waters of the state that are of higher quality than would otherwise be the case if they simply met existing water quality standards. The policy prevents actions that would meet existing water quality objectives but would result in the degradation of the quality of those higher quality water bodies.
- **California Non-Point Source Pollution Control Program:** The California Non-Point Source Pollution Control Program established policies to protect the quality of water resources from the adverse effects of non-point source pollution. The Non-Point Source Pollution Control Program goals are to minimize non-point source pollution from land use activities in agriculture, urban development, forestry, recreational boating and marinas, hydro-modification, and wetlands.
- **California Lake and Streambed Alteration Program (Section 1602):** Section 1602 of the California Lake and Streambed Alteration Program requires a permit from the CDFG for activities that would result in the modification of the bed, bank, or channel of a stream, river, or lake, including water diversion and damming and removal of vegetation from the floodplain to the landward extent of the riparian zone. The permit governs both activities that modify the physical characteristics of the stream and activities that may affect fish and wildlife resource that use the stream and surrounding habitat.
- **California Pollution Discharge Elimination System (Adopted Order 2009-0009-DWQ):** The California Pollution Discharge Elimination System requires all facilities that discharge pollutants from any point source into WOUS to obtain or seek coverage under a General or Individual Permit. The General Construction Stormwater Permit is administered by the SWRCB. On tribal lands in California, the NPDES is administered by the EPA.

3.19.2 Study Area

The water resources study area includes a 4,000-foot-wide corridor encompassing the Proposed Action and Alternative segments. The 4,000-foot-wide corridor is necessary to allow for some flexibility of Project routing and design and to allow for errors or ambiguities in the recorded locations and boundaries of some water resources. The water resources study area also encompasses 200-feet on either side of the alternative SCS 12kV distribution line. In the study area, the surface water resources evaluated consist of the Colorado River, ephemeral washes, the CAP canal, irrigation ditches and canals, wetlands, floodplains, other information from the USGS National Hydrography Dataset (NHD), and their associated water quality and uses. Groundwater resources evaluated for the study area consist of groundwater basins, wells, springs, and their associated water quality and uses.

Existing geospatial information was reviewed to identify and describe surface water and groundwater resources. This data was supplemented with additional reviews of applicable reports, online resources, and other readily available resource materials. The primary information sources used for this analysis are described more fully in the water resources baseline report (HDR 2017j), but include USGS mapping (primarily the NHD); USFWS National Wetland Inventory (NWI) mapping; and Federal Emergency Management Agency (FEMA) mapping for floodplains (where available within the study area). In the cases of wetlands and other WOUS, the readily available resource materials were at a scale and/or level of detail where a definitive identification at a permitting-need level could not be made. In those cases, the USACE recommended the use of USFWS NWI dataset (USFWS 2016d) as the basis for evaluating the occurrence and extent of wetlands across the Project Area and the NHD mapping layer as the basis for identifying stream crossings that are potentially subject to USACE jurisdiction (HDR 2016e, 2016f). More site-specific surveys would most likely be needed once a route was chosen. For example, site-specific wetland surveys would include delineation and a function and values determination. Non-wetland WOUS surveys would determine jurisdictional status and length, area, and fill volume as needed.

State of Arizona and state of California data sources were also consulted for information on groundwater basin boundaries, groundwater well locations, and water rights, as fully described by HDR (2017j).

3.19.3 Existing Conditions

The Project Area extends across 13 watersheds and is underlain by six groundwater basins in the Lower Colorado River Basin. Section 3.19.3.1 summarizes the surface water resources in the study area and Section 3.19.3.2 summarizes the groundwater resources in the study area. These sections provide an inventory of these resources along the Proposed Action and Alternative segments by geographic area.

3.19.3.1 Surface Water (Includes Wetlands)

The water resources study area is located in the Lower Colorado Hydrologic Region (USGS 2016d) and the Basin and Range physiographic province is characterized by intermittent mountain ranges and flat arid valleys (Robson and Banta 1995). Surface water, floodplain processes, wetlands, and irrigation-controlled agricultural activities associated with the Colorado River are common along the Arizona and California state border. Outside of the river corridor, naturally occurring surface water is uncommon and occurs only seasonally except for where canals and irrigation districts divert and pump water for irrigation and other beneficial purposes from deep groundwater basins or directly from the Colorado River.

The Watershed Boundary Dataset and NHD geospatial databases provided the basis to evaluate existing surface water conditions for the study area. The USGS divides regions into hydrologic unit codes (HUCs) at varying resolution to define surface water basins, sub-basins, watersheds, and sub-watersheds. For this analysis, 10-digit HUCs were used to inventory the watersheds in the study area. Using a 10-digit HUC approach accommodates geomorphic or other relevant basin characteristics and provides uniform size distribution of watersheds in a broader physiographic area (NRCS 2016e). The study area falls within the 13 watersheds identified in Table 3.19-1. Figures 3.19-1a through Figure 3.19-1w (Appendix 1) show the boundaries of each watershed crossed by the Proposed Action and Alternative segments, as well as the total number and length of drainages in each watershed.

Table 3.19-1 Watersheds and Hydrologic Summary in the General Project Area

STATE	HUC-8 WATERSHED [A]	HUC-10 WATERSHED	WATERSHED SIZE (SQUARE MILES)
AZ	Centennial Wash (15070104) [b]	Tiger Wash (1507010403)	161.2
		Upper Harquahala Plains-Centennial Wash (1507010404)	227.9
		Middle Harquahala Plains-Centennial Wash (1507010405)	326.5
		Winters Wash (1507010406)	275.2
	Bouse Wash (15030105) [c]	Alamo Wash (1503010501)	114.1
		Middle Bouse Wash (1503010504)	330.6
		Upper Bouse Wash (1503010502)	448.7
	Tyson Wash (15030106) [c]	Upper Tyson Wash (1503010601)	363.6
		Middle Tyson Wash (1503010602)	154.7
	Imperial Reservoir (15030104) [c]	Ehrenberg Wash-Colorado River (1503010406)	242.4
		Mohave Wash-Colorado River (1503010407)	133.2
AZ/CA	Imperial Reservoir (15030104) [c]	Palo Verde Valley (1503010408)	389.0
CA	Southern Mojave (18100100)	Ford Well (1810010052)	175.9

Sources: USGS Watershed Boundary Dataset and National Hydrography Dataset (USGS 2016f and 2016d); US Fish and Wildlife Service National Wetland Inventory (USFWS 2016d).
HUC = Hydrologic Unit Code
a Watersheds listed from east to west in the Project Area, by HUC identification number.
b Associated with the Lower Gila River Basin (ADWR 2016a).
c Associated with the Lower Colorado River Basin (ADWR 2016a).

The overall Project Area is characterized as arid dry land where the majority of drainages are ephemeral, being generally dry for long periods of time and flow during high-intensity, short-duration summer thunderstorms and during less intense, longer duration winter storms. Surface runoff is typically erratic in rate and volume, is usually sediment-laden, and occurs only in direct response to local storms. Streambeds tend to be very permeable and substantial water percolates into the soil, recharging regional aquifers as flow moves downstream. The Colorado River is the largest river in the region, with a watershed encompassing approximately 244,000 square miles in portions of seven states (Wyoming, Utah, Colorado, Nevada, New Mexico, Arizona, and California). The Colorado River provides water to more than 35 million people and approximately 4 million acres of agricultural lands in the US and Mexico (Water Education Foundation 2013). USGS gage number 09429100 (Colorado River below Palo Verde Dam, AZ-CA) is the stream gage nearest the Project Area. It is 12.9 miles upstream from the location where Proposed Segments p-15e and p-15w would cross the Colorado River. The only measurement recorded by this gage is the discharge, displayed in cubic feet per second. The mean annual discharge for the years 1956 to 2015 is 7,921 cubic feet per second. The peak flows seem to occur in April and the lowest flows seem to occur in December, based on the available information (USGS 2016e).

The CAP canal enters the general Project Area from the north near Vicksburg, Arizona, and continues to flow east beyond the Delaney Substation. The canal is a 336-mile-long diversion canal consisting of aqueducts, tunnels, pumping plants, and pipelines constructed by Reclamation. The canal represents the largest source of water supplied in Arizona, carrying approximately 1.5 million acre-feet of Colorado River water annually to municipal, agricultural, and industrial users. Segment p-01 of the Proposed Action would cross the canal in two locations north of I-10 and Alternative Segments i-01 and i-03 would each cross the canal in two locations south of I-10.

Various agricultural stock ponds, canals, irrigation ditches, and associated embankments, dikes, and levees are located within the agricultural lands of the Palo Verde Irrigation District, located south and west of Blythe near the western end of the Project and the Harquahala Irrigation District near Tonopah on the eastern end of the Project. These features allow for a controlled application of water to farmed fields. The Palo Verde Diversion Dam is located on the Colorado River approximately 9 miles northeast of Blythe. The dam serves as a diversion of irrigation water to the Palo Verde Irrigation District. The District contains approximately 131,298 acres, 26,798 acres of which are on the Palo Verde Mesa, which is situated approximately 80 to 130 feet higher than Palo Verde Valley (Reclamation 2016b). Blythe is in the Palo Verde Irrigation District boundary and uses the District's water rights to the Colorado River water. Private pumps lift water from the Colorado River, which is supplied through Palo Verde Irrigation District canals, onto the Mesa to irrigate a portion of the acreage in the District. Deep wells developed by landowners irrigate the remaining mesa irrigated acreage (Reclamation 2016b). The Harquahala Irrigation District contains approximately 25,950 acres under irrigation. The District uses both surface water and groundwater to irrigate. The CAP canal transports surface water, which accounts for approximately 69,600 acre-feet of surface water used annually compared to an annual use of approximately 36,500 acre-feet from groundwater wells across the District (ADWR 2016a).

<u>Surface Water Rights</u>

"The Colorado River is managed and operated under numerous compacts, Federal laws, court decisions and decrees, contracts, and regulatory guidelines collectively known as the 'Law of the River.' This collection of documents apportions the water and regulates the use and management of the Colorado River among the seven basin states and Mexico. Based on this body of law, Arizona has the right to use 2.8 million acre-feet annually of the Colorado River water" (ADWR 2016b) and California has the right to use 4.4 million acre-feet annually of Colorado River water (ADWR 2016b).

In Arizona, allocation of surface water is determined by the "doctrine of prior appropriation," otherwise known as "first in time, first in right." Those who put the water to use first are senior water rights holders and those who come later hold junior rights. If a junior user is upstream from a senior user, the junior user must leave enough water in the stream to fulfill the senior user's rights. The ADWR manages a water permit program that records surface water rights. Most of the state's surface water is controlled by a relatively small number of public and semi-public organizations (Water Education Foundation 2007).

Surface water in Arizona can only be appropriated for beneficial uses defined as domestic, municipal, irrigation, stock watering, wildlife, hydropower, recreation, mining, and non-recoverable water storage. The type of beneficial use also dictates the quantity of surface water that may be appropriated (ADWR 2016c). The ADWR Surface Water Filing database was reviewed to determine the extent of water rights within the study area in Arizona. The database contains coordinate locations that are associated with active or inactive applications for permit to appropriate public water of the state of Arizona or to construct a reservoir or stock pond. A total of 54 filings are located within the study area. Of these, seven locations are active permits that are used solely for wildlife and livestock water. The remaining filings are inactive cases that have been withdrawn, rejected, or closed (ADWR 2016d). The active filings are summarized in Table 3.19-2.

Table 3.19-2 Surface Water Filings in the Study Area

MAP ID	PERMIT NUMBER	NAME	PERMIT HOLDER	WATER USE	HUC-10 WATERSHED
SWF-1	38-67361; 38-17975	Beacon Tank	BLM and Hi-Way Electric Co.	Livestock and Wildlife Water	Upper Harquahala Plains-Centennial Wash
SWF-2	38-67358	Moore Tank	Hi-Way Electric Co.	Livestock and Wildlife Water	Upper Harquahala Plains-Centennial Wash
SWF-3	38-17229; 38-67357	Gasline Tank	BLM and Hi-Way Electric Co.	Livestock and Wildlife Water	Upper Harquahala Plains-Centennial Wash
SWF-4	36-2804; 38-67364	Yuma Tank	ASLD and Seven Lakes Co, Inc.	Livestock and Wildlife Water	Upper Harquahala Plains-Centennial Wash
SWF-5	36-26061; 38-9023; 38-9024	Dry Corral	K Lazy B Ranch and Kemper Brown	Livestock Water	Upper Bouse Wash

In California, surface water is a public resource and water rights are managed to provide the right to reasonable and beneficial use of the water, not ownership of the water. Public interests are involved at every level of water management in California. Rights to use water are subject to the state's obligation under the Public Trust Doctrine that imposes responsibilities on state agencies to protect resources associated with California waterways, such as navigation, recreation, fisheries, and related beneficial uses. State laws require that water be used in a reasonable and beneficial manner and prohibits misuse and waste of water. All types of water rights are subject to this constitutional policy, and a state agency, the SWRCB Division of Water Rights, is authorized to take action to prevent unreasonable uses of water. In addition, the SWRCB conducts hearings to determine water rights on un-appropriated water bodies (Sawyer 2010).

A review of the SWRCB Water Rights Information Management System (eWRIMS) was conducted to determine the extent of water rights within the study area in California. The eWRIMS did not indicate any appropriative water rights or surface water diversion points within the study area (CDWR 2016b).

Floodplains

Floodplains provide numerous benefits to the Project Area by providing temporary floodwater storage and conveyance, and by absorbing, distributing, and filtering excess water and its associated sediments and contaminants, as well as wildlife habitat. Floodplains of the Colorado River may improve and maintain water quality by filtering and absorbing stormwater runoff. Natural floodplain habitats are important because undeveloped areas in the floodplain provide locations for groundwater recharge; a link in the food chain and nutrient cycle; a filtering mechanism for pollutants that might otherwise reach the river; and protection from floods and storm waters. Floodplains along the Colorado River provide unique environments that contribute to wetland and upland habitat complexes.

Flood hazards in the study area are attributable to the flows of the Colorado River, potential dam failure along the river, and floods along the larger ephemeral tributaries of the Colorado River. Developments encroaching on floodplains can affect the distribution and timing of drainage, thereby increasing floods. Development in floodplains can create or exacerbate local flooding by altering or confining drainage channels.

A base flood, commonly referred to as a 100-year flood, is caused by a flood with a 1 percent chance of occurring in any given year. The area where a base flood occurs is referred to as the 100-year floodplain. To identify the locations and extent of the 100-year floodplains in the Project Area, FEMA Flood Insurance Rate Maps included in the National Flood Hazard Layer were reviewed. Review of the FEMA Flood Insurance Rate Maps aided in determining the relationship of the water resources study area to the boundaries of 100-year floodplains.

An encroachment is an action within the limits of the 100-year floodplain. The regulatory floodway is the portion of the floodplain area reserved by Federal, state, and/or local requirements in an unconfined and unobstructed manner to provide for discharge of a base flood so that the overall increase in water surface elevation is no more than 1 foot (not a significant increase), as established by the FEMA. Normally, the ordinary high water mark defines the channel. If it can be demonstrated that development within the floodway would not cause the base floodwater surface elevation to rise, the development may be authorized under the National Flood Insurance Program requirements.

The National Flood Hazard Layer includes mapping for Special Flood Hazard Areas (SFHAs), which are the 100-year floodplains. SFHAs are areas where the National Flood Insurance Program floodplain management regulations must be enforced and where the mandatory purchase of flood insurance applies. SFHAs applicable to the water resources study area are:

- Zone A: Areas inundated by 100-year flood, generally determined using approximate methodologies. Detailed hydraulic analyses have not been performed; therefore, no Base Flood Elevations or depths are shown.
- Zones AE: Areas inundated by 100-year flood that are determined by detailed methodologies. Base Flood Elevations are shown.

SFHAs have been determined for approximately 49 percent of the study area (103,940 acres); the remaining areas are unmapped and their flood hazard undetermined. Figures 3.19-1a through 3.19-1w (Appendix 1) show the extent of FEMA's 100-year floodplain mapping available for the study area. The areas not mapped as 100-year floodplain are designated as moderate- or low-risk areas for flooding or are not considered at risk for flooding in any circumstances. Levees, dikes, and upstream dams control floods in developed areas of the Project and along the Colorado River valley. Undeveloped desert environments, however, are subject to seasonal flooding or ponding over extensive areas. Flooding in the study area occurs primarily from overflows of drainage channels when flows exceed the capacity of the channels.

FEMA defines encroachments as, "activities or construction within the floodway including fill, new construction, substantial improvements, and other development" (2016b). Each zone discussion identifies potential encroachments to SFHAs by the Proposed Action and Alternative Segments. The following is a list of descriptions of SFHAs designated as Zone A and/or Zone AE (100-year floodplains) that the study area crosses. The total acreage of FEMA designated SFHAs in each segment and the length of segment in designated SFHAs is included on Table 3.19-3.

- <u>CAP canal</u>: In the East Plains and Kofa Zone, a narrow strip of land situated immediately upslope of the CAP canal is designated as Zone A. During storms, runoff in ephemeral washes flowing downslope from north to south are intersected by the perpendicular running CAP canal. The earthen berms of CAP canal impound surface flow, developing floodwaters adjacent to the canal for periods of time. This flood prone area generally extends approximately 1,500 feet beyond the upslope limits of the CAP canal.
- <u>Centennial Wash</u>: Centennial Wash, located in the East Plains and Kofa Zone, flows from the northwest between the Harquahala and Little Harquahala Mountains to the southeast of the study area. The wash and its tributaries are ephemeral, flowing only in response to storms. FEMA has determined that the Centennial Wash floodplain is a high-risk area for flooding (Zone A and AE). The floodplain in the study area has an approximate width of 1 to 8 miles.
- <u>Bouse Wash</u>: Bouse Wash and its tributaries, located in the East Plains and Kofa Zone, are ephemeral. The wash runs southeast to northwest across the study area. FEMA has determined that the Bouse Wash floodplain is a high-risk area for flooding (Zone A). The floodplain in the study area has an approximate width of 1 mile.
- <u>Tyson Wash</u>: Tyson Wash, located in the Quartzsite Zone, is ephemeral and flows north through the Town of Quartzsite and then west into the Colorado River. FEMA has determined that most areas along the Tyson Wash floodplain are high-risk areas for flooding (Zone A and AE). In the study area, the Tyson Wash floodplain averages 2,500 feet in width.
- <u>La Cholla Wash</u>: La Cholla Wash, located in the Quartzsite Zone, is an ephemeral tributary of Tyson Wash. The wash flows northeast from the Dome Rock Mountains, crosses I-10, and then flows into Tyson Wash north of the Town of Quartzsite. FEMA has determined that the La Cholla Wash floodplain is at high risk for flooding (Zone A). In the study area, the floodplain varies in width from 350 feet to 1,500 feet.
- <u>Gonzales Wash</u>: Gonzales Wash, located in the Copper Bottom Zone, is an ephemeral tributary of the Colorado River that originates in the area where I-10 crosses the Dome Rock Mountains west of the Town of Quartzsite. The wash flows from east to west. FEMA

has determined that the Gonzales Wash floodplain is at high risk for flooding (Zone A). In the study area, the floodplain varies in width from 450 feet to 650 feet.

- La Paz Arroyo: La Paz Arroyo, located in the Copper Bottom Zone, is the next major ephemeral tributary of the Colorado River located south of Gonzales Wash. The wash drains a portion of the Dome Rock Mountains located south of I-10 and north of the Ehrenberg Wash basin. FEMA has designated several floodplain channels within the La Paz Arroyo as high risk for flooding (Zone A). In the study area, the floodplain varies in width from 150 feet to 1,300 feet.
- Ehrenberg Wash: Ehrenberg Wash, located in the Copper Bottom Zone, is an ephemeral tributary of the Colorado River and runs from east to west through the Dome Rock Mountains southwest of Quartzsite. FEMA has determined that the Ehrenberg Wash floodplain is at high risk for flooding (Zone A). In the study area, the Ehrenberg Wash floodplain averages 1,500 feet in width.
- Limekiln Wash: Limekiln Wash, located in the Copper Bottom Zone, is the next major ephemeral tributary of the Colorado River located south of Ehrenberg Wash. The wash drains a portion of the western foothills of the Dome Rock Mountains. FEMA has designated the Limekiln Wash floodplain as Zone A. In the study area, the Limekiln Wash floodplain averages 400 feet in width.
- Lake Wash: Lake Wash, located in the Copper Bottom Zone, is an ephemeral tributary of the Colorado River located south of Limekiln Wash. The wash drains a basin situated across the southern portion of the Dome Rock Mountains. FEMA has designated the Lake Wash floodplain as Zone A. In the study area, the Lake Wash floodplain averages 1,100 feet in width.
- Colorado River: The Colorado River, located in the Colorado River and California Zone, is the largest perennial stream in the study area. A series of upstream dams and other flood control structures manages the flow of the Colorado River. FEMA has designated the river and its adjacent floodplain as Zone A and AE. The flood prone areas range from 1,000 to 3,000 feet in width in the study area.

Table 3.19-3 Flood Hazards for Proposed Action and Alternative Segments

SEGMENT	MODERATE TO LOW RISK [A]		HIGH RISK [A]	
	AREA WITHIN 4,000-FOOT CORRIDOR (ACRES)	SEGMENT LENGTH (MILES)	AREA WITHIN 4,000-FOOT CORRIDOR (ACRES)	SEGMENT LENGTH (MILES)
East Plains and Kofa Zone				
p-01	11,331	24.5	1,654	1.7
p-02	778	1.2	25	—
p-03	1,298	2.1	—	—
p-04	2,974	5.5	—	—
p-05	1,245	2.0	—	—
p-06	3,915	7.8	430	0.9
d-01	8,626	17.4	3,842	7.8
i-01	4,304	8.4	25	—
i-02	1,886	3.3	—	—
i-03	3,747	7.4	1,131	2.3
i-04	68	—	—	—
in-01	684	0.8	—	—
x-01	4,125	7.9	—	—
x-02	3,554	6.7	—	—
x-03	3,020	5.6	—	—
x-04	4,278	8.4	802	1.7
Quartzsite Zone				
p-07	—	—	—	—
p-08	—	—	—	—
i-05	523	0.8	—	—
qn-01	577	0.6	—	—
qn-02	5,126	10.2	350	0.6
qs-01	1,206	2.3	111	—
qs-02	1,857	3.3	550	1.4
x-05	630	1.4	—	—
x-06	840	1.4	—	—
x-07	148	—	19	—

SEGMENT	MODERATE TO LOW RISK [A]		HIGH RISK [A]	
	AREA WITHIN 4,000-FOOT CORRIDOR (ACRES)	SEGMENT LENGTH (MILES)	AREA WITHIN 4,000-FOOT CORRIDOR (ACRES)	SEGMENT LENGTH (MILES)
Copper Bottom Zone				
p-09	—	—	—	—
p-10	—	—	—	—
p-11	1,172	2.1	—	—
p-12	1,427	2.5	146	0.2
p-13	1,687	2.9	281	0.6
p-14	569	0.6	173	0.3
cb-01	428	0.6	—	—
cb-02	439	0.6	—	—
cb-03	1,148	2.1	—	—
cb-04	1,081	1.9	113	—
cb-05	1,995	3.5	396	0.9
cb-06	844	1.9	373	0.1
i-06	2,863	6.6	212	0.5
i-07	3,048	5.8	374	0.7
x-08	903	1.3	—	—
Colorado River and California Zone				
p-15e	904	1.9	608	0.9
p-15w	—	—	193	0.1
p-16	—	—	—	—
p-17	—	—	—	—
p-18	—	—	—	—
ca-01	—	—	—	—
ca-02	—	—	—	—
ca-04	3	—	198	0.1
ca-05	—	—	—	—
ca-06	—	—	—	—
ca-07	—	—	—	—
ca-09	—	—	—	—
cb-10	744	1.1	314	0.7
i-08s	517	0.9	293	0.4
x-09	—	—	—	—
x-10	—	—	2	—

SEGMENT	MODERATE TO LOW RISK [A]		HIGH RISK [A]	
	AREA WITHIN 4,000-FOOT CORRIDOR (ACRES)	SEGMENT LENGTH (MILES)	AREA WITHIN 4,000-FOOT CORRIDOR (ACRES)	SEGMENT LENGTH (MILES)
x-11	5	—	195	0.1
x-12	—	—	—	—
x-13	—	—	—	—
x-15	—	—	—	—
x-16	—	—	—	—
x-19	—	—	—	—

Source: FEMA National Flood Hazard Layer (FEMA 2016a)

[a] For locations where overlap occurs with the 4,000-foot study area but a crossing length is not shown, the floodplain overlaps with the study area, but does not intersect the proposed or alternative route.

In addition to FEMA-designated flood zones, the CDWR has identified additional flood hazard areas that are not mapped on the National Flood Insurance Program maps. These areas have been identified to provide information to communities and residents on potential flood hazards specific to their properties. The areas surrounding the study area have not yet been assessed to complete Awareness Floodplain Maps.

Waters of the United States Including Wetlands

A consideration for constructing the Project is the presence of WOUS, including wetlands. By Federal law and associated policy, it is necessary to first avoid project impacts on these resources wherever practicable, minimize impacts that cannot be avoided, and in some cases, compensate for unavoidable impacts. WOUS and wetlands are defined as follows:

- WOUS: The CWA defines WOUS as "surface waters, including streams, streambeds, rivers, lakes, reservoirs, arroyos, washes, and other ephemeral watercourses and wetlands" [33 CFR Part 328.3(a)]. The jurisdictional limits of WOUS include:
  - In the absence of adjacent wetlands, CWA jurisdiction extends to the ordinary high water mark; or
  - When adjacent wetlands are present, jurisdiction extends beyond the ordinary high water mark to the limits of the adjacent wetlands; and
  - When WOUS consist only of wetlands, jurisdiction extends to the limits of the wetlands.
- Wetlands: Wetlands are a subset of WOUS. The CWA defines wetlands as "Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" [33 CFR Part 328.3(b)]. Note that according to the 1987 Corps of Engineers Wetlands Delineation Manual (USACE 1987) and the 2008 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (USACE 2008),

wetlands must possess the following three characteristics: (1) a vegetation community dominated by plant species that are typically adapted for life in saturated soils; (2) inundation or saturation of the soil during the growing season; and (3) soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions.

Existing wetland and WOUS mapping from the NWI for the water resources study area was reviewed (USFWS 2016d). NWI mapping represents the extent, approximate location, and type of wetlands and deepwater habitats as defined by Cowardin et al. (1979). The NWI dataset is an effective tool for large-scale planning and analysis of wetlands and waters but is generally not suitable for permitting or engineering design. NWI mapping is primarily based on aerial photographic interpretation with limited ground verification; therefore, boundaries tend to be oversimplified or many smaller wetlands and drainages are not included in the mapping. Figures 3.19-1a through Figure 3.19-1w (Appendix 1) show the approximate extent of wetlands and WOUS mapped by USFWS in the study area.

USFWS has mapped potentially jurisdictional WOUS, including wetlands in nearly every watershed mentioned in Table 3.19-1 that the study area crosses; however, wetlands are not common along the Proposed Action and Alternative Segments. In the study area, wetlands are primarily only mapped in areas along the Colorado River corridor. Although wetlands and other WOUS are uncommon, potentially jurisdictional WOUS, mostly consisting of ephemeral washes, occur throughout the study area at each mapped drainage crossing. In general, natural ephemeral washes can perform a diversity of hydrologic and biogeochemical functions that directly affect the integrity and functional condition of higher-order waters downstream. Many of the latter type of functions depend upon the presence of a riparian corridor, which is lacking in most of the study area's ephemeral streams. Instead, most of the area washes likely perform more limited hydrological functions such as providing adequate capacity for flood control, energy dissipation, and sediment movement.

Drainage crossings for each Proposed Action and Alternative segments are summarized in Table 3.19-4.

Table 3.19-4 Surface Water Resources of Proposed Action and Alternative Segments

SEGMENT	IRRIGATION CANAL/DITCH CROSSINGS	EPHEMERAL WASH CROSSINGS	PERENNIAL STREAM CROSSINGS	TOTAL CROSSINGS	WETLAND CROSSING LENGTH (FEET)	WOUS (NON-WETLAND) CROSSING LENGTH (FEET)
East Plains and Kofa Zone						
p-01	—	28	—	28	—	1,357
p-02	—	—	—	—	—	—
p-03	—	1	—	1	—	29
p-04	—	4	—	4	—	104
p-05	—	1	—	1	—	54
p-06	—	21	—	21	—	802
d-01	5	18	—	23	—	1,167
i-01	—	4	—	4	—	246
i-02	—	—	—	—	—	—
i-03	1	25	—	26	—	1,467
i-04	—	20	—	20	—	556
in-01	—	16	—	16	—	922
x-01	1	1	—	2	—	86
x-02a	—	—	—	—	—	—
x-02b	—	1	—	1	—	24
x-03	—	1	—	1	—	28
x-04	—	26	—	26	—	687
Alt. SCS Dist. Line	—	—	—	—	—	63

SEGMENT	IRRIGATION CANAL/DITCH CROSSINGS	EPHEMERAL WASH CROSSINGS	PERENNIAL STREAM CROSSINGS	TOTAL CROSSINGS	WETLAND CROSSING LENGTH (FEET)	WOUS (NON-WETLAND) CROSSING LENGTH (FEET)
Quartzsite Zone						
p-07	—	1	—	1	—	84
p-08	—	—	—	—	—	—
i-05	—	5	—	5	—	488
qn-01	—	1	—	1	—	34
qn-02	—	18	—	18	—	803
qs-01	—	4	—	4	—	474
qs-02	—	9	—	9	—	1,129
x-05	—	18	—	18	—	386
x-06	—	14	—	14	—	393
x-07	—	8	—	8	—	253
Copper Bottom Zone						
p-09	—	9	—	9	—	252
p-10	—	2	—	2	—	46
p-11	—	2	—	2	—	52
p-12	—	8	—	8	—	311
p-13	—	10	—	10	—	282
p-14	—	4	—	4	—	730
cb-01	—	—	—	—	—	—
cb-02	—	2	—	2	—	848
cb-03	—	7	—	7	—	1,741

SEGMENT	IRRIGATION CANAL/DITCH CROSSINGS	EPHEMERAL WASH CROSSINGS	PERENNIAL STREAM CROSSINGS	TOTAL CROSSINGS	WETLAND CROSSING LENGTH (FEET)	WOUS (NON-WETLAND) CROSSING LENGTH (FEET)
cb-04	—	2	—	2	—	79
cb-05	—	7	—	7	—	1,525
cb-06	—	1	—	1	—	24
i-06	—	14	—	14	—	701
i-07	—	12	—	12	—	422
x-08	—	3	—	3	—	92
Colorado River and California Zone						
p-15e	—	6	1	7	518	718
p-15w	10	—	1	11	61	718
p-16	10	—	—	10	—	245
p-17	—	8	—	8	—	294
p-18	—	3	—	3	—	95
ca-01	11	—	3	14	104	381
ca-02	6	—	—	6	—	1,244
ca-04	1	1	—	2	105	824
ca-05	12	1	2	15	71	299
ca-06	4	—	—	4	—	63
ca-07	—	—	—	—	—	—
ca-09	—	—	—	—	—	61
cb-10	—	4	1	5	1,162	782
i-08s	1	—	1	2	379	156
x-09	1	—	—	1	—	20

SEGMENT	IRRIGATION CANAL/DITCH CROSSINGS	EPHEMERAL WASH CROSSINGS	PERENNIAL STREAM CROSSINGS	TOTAL CROSSINGS	WETLAND CROSSING LENGTH (FEET)	WOUS (NON-WETLAND) CROSSING LENGTH (FEET)
x-10	2	—	—	2	—	360
x-11	2	—	—	2	—	479
x-12	—	—	—	—	—	51
x-13	3	—	—	3	—	280
x-15	—	—	—	—	—	—
x-16	—	—	—	—	—	—
x-19	—	—	—	—	—	—

Source: USGS Watershed Boundary Dataset and National Hydrography Dataset (USGS 2016f and 2016d); USFWS National Wetland Inventory (USFWS 2016d).

During storms, surface water from some ephemeral washes flows into larger tributaries of the Colorado River. The Colorado River is defined as a Traditional Navigable Water (TNW), and tributaries that drain into a TNW are generally considered WOUS as defined in Section 404 of the CWA. Accordingly, stream beds below the ordinary high water mark for each drainage crossing may be subject to USACE jurisdiction and require a permit if impacts on them are unavoidable.

A Section 404 Permit of the CWA is required for the discharge of dredged or fill material into WOUS. A Section 10 permit would be required for the crossing of navigable waters (Colorado River) under the jurisdiction of Section 10 of the Rivers and Harbors Act. A General Permit (specifically, Nationwide Permit (NWP)12 Utility Line Activities) would be the likely applicable Section 404 permit for most Project features requiring compliance. In accordance with USACE guidelines for Individual Permits or NWP No. 12, notification of the Project and an application for permit would be required for the crossing of the Colorado River and, if necessary, for unavoidable Project-related impacts on jurisdictional WOUS, including wetlands.

Riparian Areas

Riparian areas are the vegetated corridors adjacent to water bodies. In Arizona and California, these areas are particularly important, as they can exist within desert areas and host a variety of wildlife that depend on the vegetation and water for foraging and roosting. The type of vegetation within riparian areas changes based on soil type, temperature, elevation, and seasonal water fluctuations (AGFD 2016d). These areas are some of the most productive ecosystems in the US due to their diversity and proximity to water, which is often a limiting resource for wildlife. In Arizona, 70 percent of the state's threatened and endangered species rely on riparian zones for survival (Arizona Cooperative Extension 2016).

Within the study area, riparian areas are located adjacent to the Colorado River on the Arizona/California border just east of Blythe, California. No other riparian areas are present in the study area (HabiMap Arizona 2016). Within the study area near the Colorado River, the riparian areas are limited in width compared to other areas along the Colorado River where less development occurs.

Surface Water Quality

Surface water in the study area is characterized as either perennial or ephemeral. Perennial waters consist of the Colorado River and its diversions, and irrigation canals, ditches, and basins associated with the Harquahala Irrigation District and the Palo Verde Irrigation District. Water quality in these features is generally good and suitable for agricultural activities but may not meet drinking water quality standards. Ephemeral waters are generally confined in desert washes, flowing only in conjunction with heavy storms. Their water quality is variable depending on the amount of flow, underlying substrate, proximity to potential pollutant sources (roadways, agricultural fields, and impervious services), and the duration of storms. Organic matter and eroded sediment are likely carried by ephemeral waters during storms, but flows can quickly diminish and are collected into larger washes where they percolate back into the ground or flow directly into the Colorado River.

Surface water quality standards in Arizona and California are administered through both Federal and state regulations that are intended to protect lakes, reservoirs, rivers, streams, wetlands, and other surface water bodies from pollution. These rules contain beneficial use designations; numeric levels and narrative statements (water quality criteria) that are protective of the use designations; and procedures for applying the water quality criteria to wastewater discharges and other sources of pollution (ADEQ 2016b).

In Arizona, surface water quality standards apply to all surface waters within the state (AAC R18-11-101(41)), with the exception of those waters that are within Indian Country, as defined in 18 USC Section 1151. Beneficial uses include drinking water, fishing, aquatic and wildlife habitat, recreation, agriculture, irrigation, and others. Water quality criteria are used to establish numeric and narrative standards necessary to protect and ensure that beneficial uses are attained. A surface water may have more than one designated use assigned to it and more than one standard for a given pollutant that applies based on the designated uses. Under the surface water quality standards, all existing and designated uses shall be maintained and protected for all surface waters in Arizona. Surface water quality that is better than the applicable criteria must also be maintained and protected (ADEQ 2016b).

California developed a system to protect and control the quality of its surface waters when the state legislature passed the Porter-Cologne Water Quality Control Act. The Act recognizes that factors affecting the quality and use of water vary from region to region within the state by establishing a regionally administered program for water quality control within a framework of statewide coordination and policy. The Water Boards carry out their water quality protection authority through the adoption of Water Quality Control Plans. Water Quality Control Plans establish water quality standards, beneficial uses, and water quality objectives for particular bodies of water and their tributaries. The Water Quality Control Plans also contain the state's anti-degradation policy and implementation plans to achieve and maintain compliance with the water quality objectives (California EPA 2016).

Under Section 303(d) of the CWA, states, territories, and authorized tribes are required to develop a list of surface waters with impaired water quality. Waters on the list do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that these jurisdictions establish priority rankings for surface waters on the lists and develop action plans, called total maximum daily loads (TMDLs), to improve water quality. TMDLs are used to determine the amount of a pollutant that a water body can receive and still support its designated uses.

In 2012, the California Regional Water Quality Control Board, Colorado River Basin Region (Colorado River Basin Water Board) completed assessments of water quality data and information as required by Sections 303(d) and 305(b) of the CWA. Revisions to the Section 303(d) list of impaired water bodies was authorized on March 20, 2014, under Board Resolution R7-2014-0025 and was later approved by the EPA on July 30, 2015. The revised list was reviewed and it was determined that one impaired water body, the Colorado River, occurs in the study area. The Colorado River has been designated for a number of uses, including: municipal, domestic, agricultural, and industrial service supply; aquaculture; groundwater recharge; contact and non-contact water recreation; warm freshwater habitat; wildlife habitat; preservation of rare, threatened, or endangered species; and hydropower generation (CDWR-SWRCB 2014). The portion of the river from Lake Havasu Dam to Imperial Dam was revised to add Toxicity as a pollutant from unknown sources impairing the Colorado River. The proposed TMDL is planned to be completed by year 2025 (CDWR 2014). Impaired streams are considered sensitive resources in the routing of transmission lines and are protected from water quality impacts.

In 2015, the ADEQ completed assessments of water quality data and information for 2012 and 2014, as required by Sections 303(d) and 305(b) of the CWA. The 2012/2014 303(d) list was approved by the EPA and is now final. Review of the 2012/2014 list determined that no surface waters in the Arizona portion of the study area are listed as impaired under section 303(d) of the CWA (ADEQ 2015a).

East Plains and Kofa

The following sections describe the existing conditions for surface water resources, floodplains, and WOUS in the study area located in the East Plains and Kofa Zone. Ephemeral washes are prevalent across the undeveloped portions of this area. Areas located east of the New Water Mountains and Kofa NWR are relatively flat gradient and generally slope slowly toward the region's larger ephemeral washes, including Centennial Wash, Bouse Wash, or Alamo Wash. During heavy storms, most of these flat gradient areas are subject to overland flooding that can pond against road embankments lying perpendicular to the land gradient. If the roads lack sufficient culverts or other means of cross drainage, the overland flows can be diverted for long distances before finally overflowing the linear obstacles or entering one of the region's larger washes. The New Water Mountains and the area west toward Quartzsite consist of mountainous terrain before flattening out into the Tyson Wash drainage basin. Surface drainage across these areas tends to be more confined in ravines and washes.

Localized agricultural activities fed by irrigation, including canals, ditches, and groundwater wells, are present across extensive areas east of the Delaney Substation and south of Vicksburg. The CAP canal flows from west to east between Vicksburg and I-10 north of the Delaney Substation. Washes located upslope of the CAP canal and in the Centennial Wash drainage basin are essentially blocked by the canal's levee, which extends perpendicular to the washes. Along this area, the washes and surrounding lands are subject to periodic flooding in response to heavy storms. Mapped SFHAs surround both Centennial Wash and Bouse Wash. No perennial streams or springs occur in this portion of the study area. The CAP canal provides the only source of permanent surface water in this reach.

Proposed Action Segments: p-01 through p-06

Table 3.19-4 inventories the number and type of drainages that the Proposed Action would cross. The majority of these crossings are ephemeral except for several irrigation canal crossings. Based on a review of aerial photography, many of the area's washes have ordinary highwater marks, are connected to a larger tributary of a TNW (Colorado River), and are potentially subject to USACE jurisdiction as WOUSs. Surface water drainages in the mountainous regions of the New Water Mountains, Livingston Hills, Kofa Mountains, Littlehorn Mountains, and across the northern foothills of the Eagletail Mountains are generally narrower and steeper than drainages spread across the extensive basins between the mountain ranges. The Proposed Action crosses 55 drainages, some of which may be WOUS. No mapped wetlands occur in the study area along these segments of the Proposed Action.

The total acreage of FEMA designated SFHAs in each segment and the length of segment in designated SFHAs is included on Table 3.19-3. FEMA has determined that widespread areas crossed by the Proposed Action are moderate to low risk (Zone X) SFHAs. High-risk SFHAs (Zone A and AE) are present along the floodplains associated with Centennial Wash and Bouse Wash. Both washes are ephemeral and remain dry for the majority of the year.

Alternative Segments: d-01, i-01 through i-04, in-01, and x-01 through x-04
As previously described, most drainage crossings are ephemeral washes and are potentially subject to USACE jurisdiction. Alternative Segment d-01 crosses three semi-permanently flooded ponds in the agricultural lands located west of the Delaney Substation. A total crossing length of 378.8 feet would occur over these low-lying areas that are fed an extensive network of irrigation canals. Table 3.19-4 identifies the number and type of drainage crossings by each segment.

Similar to the Proposed Action, many widespread areas crossed by the Alternative segments are designated as moderate to low risk SFHAs. High-risk SFHAs (Zone A) include the floodplains associated with Centennial Wash and Bouse Wash. The total acreage of SFHAs in each alternative segment and the length of segment in designated SFHAs are included on Table 3.19-3.

<u>Quartzsite Zone</u>

The following section identifies the existing conditions for surface water resources, floodplains, and WOUS resources in the Quartzsite Zone. The area includes the Tyson Wash drainage basin, which is bordered by the New Water Mountains to the east and the Dome Rock Mountains to the west. Tyson Wash flows from south to north through Quartzsite before flowing west into the Colorado River. Steep, incised drainage ravines characterize the mountainous portions of the reach while numerous low gradient, wider washes flow across the drainage basin and into Tyson Wash.

Proposed Action Segments: p-07 and p-08
The Proposed Action extends perpendicular to Tyson Wash and its tributaries resulting in few drainage crossings across this reach of the study area. Most of the smaller, ephemeral washes and ravines are unmapped by USGS. Many of these drainages may lack ordinary highwater marks and therefore would not likely be subject to USACE jurisdiction. Table 3.19-4 identifies the number and type of drainage crossings by the Proposed Action. No wetlands are mapped in this portion of the study area.

FEMA has not evaluated SFHAs for the portion of study area in the Quartzsite Zone. Floodplains were delineated for areas surrounding Tyson Wash located north of the Proposed Action. It is likely that the crossing of Tyson Wash is similarly flood prone (Zone A) as areas immediately to the north where FEMA floodplain mapping is available. The approximate width of the mapped Tyson Wash floodplain located north of the Proposed Action is 2,500 feet.

Alternative Segments: i-05, qn-01, qn-02, qs-01, qs-02, x-05, x-06, and x-07
The Alternative segments are situated less perpendicular to Tyson Wash and its tributaries than the Proposed Action and therefore more potential drainage crossings exist. Table 3.19-4 identifies the number and type of crossings by each Alternative segment. No mapped wetlands exist in this zone of the study area.

FEMA floodplain mapping is available for most of the Alternative segments in this zone, with many widespread areas designated as a moderate to low risk SFHA (Zone X). High-risk SFHAs (Zone A and AE) are identified in the Tyson Wash floodplain. The total acreage of SFHAs in each alternative segment and the length of each segment in SFHAs are included on Table 3.19-3.

<u>Copper Bottom Zone</u>

The following sections identify the existing conditions for surface water resources, floodplains, and WOUS resources for the study area located in the Copper Bottom Zone. The Proposed Action and numerous Alternative segments cross the Dome Rock Mountains through or near Copper Bottom Pass. The slopes along and surrounding most segments are steep and surface water, when present, flows through narrow ravines and into larger washes at valley bottoms. Between the Dome Rock Mountains and the Colorado River, the Proposed Action and Alternative segments cross flat gradient areas bisected by numerous large and small ephemeral washes.

The Alternative segments that parallel I-10 cross fewer washes than the Proposed Action and Alternative segments that cross through Copper Bottom Pass and south of Copper Bottom Pass. After crossing the Dome Rock Mountains, the Proposed Action and several Alternative segments would cross several larger ephemeral tributaries of the Colorado River, including Ehrenberg Wash, Limekiln Wash, and Lake Wash. Each of these washes is flood prone and mapped by FEMA as a high-risk SFHA.

Proposed Action Segments: p-09 through p-14
Surface water drainages are most prevalent across the western flank of the Dome Rock Mountains. Larger ephemeral washes include Ehrenberg, Limekiln, and Lake. These washes and their smaller tributaries flow into the Colorado River. Table 3.19-4 identifies the number and type of drainage crossings by the Proposed Action.

FEMA mapped high-risk SFHAs in the floodplains of Ehrenberg Wash, Limekiln Wash, and Lake Wash. Outside of the floodplains, FEMA designated most of the areas crossed as a moderate to low risk SFHA. The total acreage of SFHAs in each Proposed Action and the length of route in SFHAs are included on Table 3.19-3.

Alternative Segments: cb-01 through cb-06, i-06, i-07, and x-08
Similar to the Proposed Action, the Alternative segments crossing west and southwest of Copper Bottom Pass would cross Ehrenberg Wash, Limekiln Wash, and Lake Wash and numerous tributaries to each wash. The northern Alternative segments that parallel I-10 would not require crossings of these washes. Table 3.19-4 identifies the number and type of drainage crossings by the Alternative segments as well as lengths through mapped wetlands.

FEMA mapped high-risk SFHAs in the floodplains of Ehrenberg Wash, Limekiln Wash, and Lake Wash. The total acreage of SFHAs in each Alternative segment and the length of segment in SFHAs are included on Table 3.19-4.

Colorado River and California Zone

The following sections identify the existing conditions for surface water resources, floodplains, and WOUS resources for the study area located in the Colorado River and California Zone. Most of the area consists of agricultural lands situated south of Blythe and in the Palo Verde Irrigation District. Numerous irrigation canals and ditches carry water directly from the Colorado River to the agricultural fields in this location. Further west, the Project Area enters the Palo Verde Mesa where there is less agricultural activity and finally crosses into an undeveloped desert environment.

Both the Proposed Action and Alternative segments cross the Colorado River in an area where wetlands extend up to 0.2 mile east of the river. The vegetation in the Colorado River floodplain is dominated by salt cedar and saltbush, with small, dense stands of mesquite and palo verde along the eastern edge. Irrigated fields are immediately to the west of the river at those crossing locations.

Proposed Action Segments: p-15e through p-18
USFWS has mapped wetlands in areas adjacent to the Colorado River and along Segment p-15e. Segment lengths through this wetland are included on Table 3.19-3. The Colorado River is a TNW, wetlands bordering it and the river itself are subject to USACE jurisdiction.

In the agricultural areas of the Palo Verde Irrigation District, the Proposed Action crosses 11 irrigation canals (Table 3.19-4). Beyond the agricultural fields to the west, the drainage crossings consist solely of small ephemeral washes. Segment p-15w crosses a narrow band of mapped wetlands in this reach of the study area.

FEMA mapped high-risk SFHAs in the floodplains of the Colorado River. Outside of the floodplains, FEMA designated most of the areas crossed as a moderate to low risk SFHA. The total acreage of SFHAs in each segment and the length of segment in SFHAs are included on Table 3.19-3. Only a small portion of the Proposed Action (Segments p-15e and p-15w) situated near the Colorado River is designated as SFHA (Table 3.19-3). The Palo Verde Diversion Dam located on the Colorado River north of the Proposed Action manages floods across this reach of the study area.

Alternative Segments: ca-01, ca-02, ca-04 through ca-07, ca-09, cb-10, i-08s, x-09 through x-19
Irrigation canal crossings by the Alternative segments are prevalent in the agricultural areas of the Palo Verde Irrigation District and small ephemeral wash crossings are common across the undeveloped desert environment west of the agricultural fields. Table 3.19-4 identifies the number and type of crossings by each Alternative segment. Several narrow crossings of mapped WOUS, including wetlands, are present in this reach of the study area.

Alternative Segments cb-10 and i-08s cross wetlands at the locations where they would cross the Colorado River. The northern Segment i-08s crosses the Colorado River in an area with agricultural fields or developed land on both sides of the river and wetlands are limited to a narrow band adjacent to the river.

Only a small area situated near the Colorado River is designated as a high-risk SFHA (Table 3.19-3). The Palo Verde Diversion Dam located on the Colorado River north of the study area manages floods across this reach of the study area. As previously described, the transmission line crossing of the Colorado River would require authorization from USACE.

3.19.3.2 Groundwater

The study area crosses six basins. Figures 3.19-2a-c (Appendix 1) shows the boundaries for each groundwater basin. Groundwater varies widely in both depth and quantity across the study area. The deeper aquifers in the eastern portion of the study area generally consist of old recharge with poorer water quality than the shallower aquifers along the Colorado River valley. The predominant use of groundwater across these basins is for irrigation of agricultural lands with minor amounts used for public, domestic, industrial, and stock. A total of 240 public and private groundwater wells of varying depths are cataloged within the study area. The density of wells is greatest in the Palo Verde Irrigation District along the Arizona and California state border, in the Harquahala Irrigation District west of Tonopah, and areas in and surrounding Quartzsite. Approximately 174 of the 240 wells occur in these localized areas. Figures 3.19-2a-c (Appendix 1) shows the locations of wells and Table 3.19-5 lists the number of wells by segment. No natural springs have been mapped in the study area; however, the shallow depth of groundwater near the Colorado River may result in isolated occurrences of groundwater discharge. Groundwater recharge across the study area occurs from natural percolation of precipitation, surface runoff from ephemeral streams, waters of the Colorado River, seepage from the CAP canal and irrigation ditches, and direct pumpage of water into aquifers from the Vidler Water Company facility in the Harquahala Irrigation District.

Groundwater Rights

In Arizona, the state owns the groundwater and governs it under the doctrine of reasonable use. The Arizona Groundwater Management Code provides ADWR with goals to conserve, protect, and distribute groundwater resources by providing a framework for comprehensive management and regulation of withdrawal, transportation, use, and conservation. The ADWR considers groundwater a public resource and it is subject to appropriation and beneficial use. The ADWR is responsible for issuing groundwater use permits. Arizona's groundwater code establishes three levels of water management to respond to different conditions. These include general provisions that apply statewide, specific provisions for irrigation non-expansion areas (INAs), and provisions for active management areas (AMAs). Outside INAs and AMAs, groundwater rights are only limited to reasonable and beneficial use. The ADWR generally requires groundwater permits to withdraw water in any part of the state (ADWR 2016e).

Portions of the study area are within the Phoenix AMA and the Harquahala INA. No designated groundwater rights occur within the study area that is situated within the Phoenix AMA. A total of 17 designated water rights are allocated within the study area located in the Harquahala INA. These rights are grandfathered groundwater rights and are used for irrigation of agricultural fields. A list of these water rights is provided in the baseline report (HDR 2017j).

In California, landowners own the groundwater and the rights are co-equal and mutual. Non-landowners can obtain water from the property owners through appropriation and are considered junior water right holders. Counties control groundwater pumping. Groundwater rights are generally classified as overlying, appropriative, and prescriptive. An overlying right allows landowners to extract water without limit unless a groundwater basin has been adjudicated. An appropriative right involves the taking of groundwater for uses other than overlying use. Prescriptive rights refer to those against either overlying or appropriative right holders that grow under adverse possession (Sawyer 2010). Rights of the overlying landowner are most important. The right of an appropriator depends on availability of surplus water and in the event of water scarcity; the appropriator must yield to the overlying owner unless the appropriator has gained prescriptive rights. No single agency has comprehensive authority to define the character or extent of groundwater or regulate groundwater statewide. State courts have jurisdiction to determine some groundwater rights and to limit pumping through adjudication. The SWRCB can determine which underground water can be converted to public use or controlled for public protection.

Groundwater Basins

The water resources study area includes six groundwater basins. The length, acreage, and number of groundwater wells within 2,000 feet of the Proposed Action and Alternative segments that cross the groundwater basins is provided in Table 3.19-5.

Phoenix Active Management Area Basin

The water supplies in the Phoenix AMA include, in order of magnitude, groundwater, surface water, CAP canal water, and treated wastewater effluent. From 2001 to 2005, groundwater withdrawal in the Phoenix AMA supplied 36 percent of the total consumption of 2.25 million acre-feet (ADWR 2016f). Approximately 53 percent of the groundwater withdrawal was used for agriculture and the remainder was used for public water supply, industrial, domestic, and other purposes. ADWR's management goal for the Phoenix AMA is to achieve safe yield by 2025 through the increased use of renewable water supplies and decreased groundwater withdrawals in conjunction with efficient water use (ADWR 2016f).

Since 1990, recharge volumes have exceeded withdrawals, primarily due to cessation of farming (and associated reductions in pumping) and direct use and recharge of CAP canal water. Groundwater depth varies widely across the basin.

Agriculture and associated irrigation practices around Tonopah directly affect groundwater levels and quality. In areas where groundwater is the primary source of irrigation water, groundwater levels typically drop over time as total withdrawals exceed the net recharge rates. In areas where surface water is imported from the CAP canal and used as the primary source of irrigation water, groundwater levels typically rise. Groundwater in agricultural areas is prone to nitrate contamination and salt buildup (ADWR 2009).

Harquahala Groundwater Basin

The Harquahala groundwater basin is located approximately 60 miles west of Phoenix, Arizona. The basin covers approximately 766 square miles in La Paz and Maricopa Counties and consists of a broad alluvial plain bordered by rugged mountain ranges (ADEQ 2014). The Centennial Wash, a tributary of the Gila River, drains the basin. All washes in the basin are ephemeral and flow only after heavy storms. Groundwater in the basin is primarily used for irrigation with minor amounts used for public water, domestic, industrial, and stock uses. There is an estimated 15.5 million acre-feet of groundwater stored in the basin above a depth of 1,200 feet. Natural recharge is estimated to average 1,000 acre-feet annually, occurring largely through infiltration of ephemeral flow in Centennial Wash. Colorado River water transported by the CAP canal, which runs west to east across the southern part of the basin, is also used for irrigation and stock uses and is recharged at the Vidler Water Company facility. Recharge to the basin from the CAP canal is estimated at nearly 6,000 acre-feet per year (ADEQ 2014).

Groundwater in the Harquahala basin is generally unsuitable for drinking water uses without proper treatment. However, the quality of water is generally suitable for irrigation use, which consists of the largest water use in the basin (ADEQ 2014).

Ranegras Plain Groundwater Basin

The Ranegras Plain groundwater basin is located 100 miles west of Phoenix in La Paz County and comprises approximately 912 square miles. There are no perennial or intermittent streams or large reservoirs located in the basin. Bouse Wash, an ephemeral stream that is a tributary to the Colorado River drains the basin. The CAP canal crosses the basin in a northwest to southeast direction. Groundwater is the only dependable source for domestic, public, irrigation, and stock water supply in the basin. Most of the basin's pumped groundwater is used for irrigation in the central part of the basin. Groundwater levels vary from depths of approximately 30 feet to 450 feet. Groundwater elevations fluctuate with irrigation pumping. Natural basin recharge is estimated to be 5,000 acre-feet annually occurring mostly by infiltration of runoff in Bouse Wash and its tributaries. Seepage losses from the CAP canal are believed to recharge approximately 6,000 acre-feet annually into the basin (ADEQ 2011). Water quality in the basin is directly related to the recharge age of the groundwater. Sites with old recharge generally have more water quality problems compared to sites with recent recharge exhibiting better water quality (ADEQ 2011).

Parker Groundwater Basin
The Parker groundwater basin is located along the western border of Arizona paralleling the Colorado River and California. The basin covers approximately 2,229 square miles in La Paz and Yuma Counties and includes the communities of Quartzsite and Ehrenberg. Groundwater flow is from the south and east toward the Colorado River. Most pumped groundwater is used for irrigation in the northwestern portion of the basin. Groundwater depth ranges from approximately 550 feet north of Quartzsite to as shallow as 10 feet west near the Colorado River. Natural groundwater recharge for the basin comes directly from the Colorado River and accounts for approximately 241,000 acre-feet per year. The Colorado River is the only perennial stream in the basin. The average seasonal flow of the Colorado River is highest in spring and summer and is regulated by scheduled releases from dams. All other washes in the basin are ephemeral and flow only after heavy storms. Groundwater in the Parker basin generally equals or exceeds drinking water standards (ADWR 2009).

Palo Verde Valley Groundwater Basin
The Palo Verde Valley groundwater basin is located along the eastern border of California paralleling the Colorado River and Arizona. All surface water and groundwater drain into the Colorado River. The Colorado River recharges the shallow aquifer by seepage in some reaches and by diversions from the Colorado River in the form of seepage from canals and irrigated land (Metzger 1973). Surface water diversions at Palo Verde Dam into the Palo Verde Irrigation District average about 1 million acre-feet annually. Approximately half of the diverted water returns to the river by natural drainage or via a drainage system that is hydraulically connected to the shallow aquifer. The remaining water is taken up by consumptive use, pumpage, and evaporation (Owen-Joyce 1984). The basin's groundwater is continually mixed with Colorado River water that is used for irrigating large parts of the valley. Groundwater in the shallow alluvial aquifer is generally of poorer quality than Colorado River water; however, water quality improves at depth in some parts of the basin, such as beneath Blythe (USGS 1971).

Palo Verde Mesa Groundwater Basin
The Palo Verde Mesa groundwater basin is located west of Blythe above the Palo Verde Valley and covers approximately 353 square miles. The underlying aquifer is at an average depth of 150 feet and is estimated to contain 6,840,000 acre-feet of groundwater (CDWR 2016c). Primary groundwater use in the basin is irrigation; however, the majority of agricultural water in the basin is derived from the Palo Verde Irrigation District, which diverts water directly from the Colorado River. Groundwater is recharged from irrigation activities, percolation of runoff from the surrounding mountains, precipitation, and subsurface inflow from the adjacent Chuckwalla Valley groundwater basin (Metzger 1973). Groundwater quality varies depending on location and depth but is generally calcium-sodium chloride or calcium-sodium sulfate in character, and has been found to be impaired by arsenic, selenium, fluoride, chloride, boron, sulfate, and total dissolved solids content (CDWR 2004).

Groundwater Quality

In Arizona, the ADEQ monitors and manages groundwater quality and in California the Colorado River Basin Water Board monitors and manages groundwater quality for the California portion of the study area. Overall, the groundwater quality across the study area is generally suitable for irrigation purposes but often requires chemical treatment for safe drinking water purposes. Both the Palo Verde Valley and Palo Verde Mesa groundwater basins have isolated occurrences of impaired groundwater quality depending on location and depth of groundwater.

The ADEQ Water Quality Assurance Revolving Fund (WQARF) Registry provides a list of sites in Arizona that may pose a risk to public health or the environment due to hazardous substances and have current or planned investigation and cleanup. There are 35 sites on the WQARF Registry; one site occurs in the Quartzsite Zone. The site is located in Quartzsite, bounded by Sunset Street to the north, Oregon Avenue to the west, Main Street (Business Route 10) to the south, and Central Boulevard (SR 95) to the east with the known groundwater contamination existing northwest of the intersection of SR 95 and Business Route 10. The site is located outside of the water resources study area for the Project. ADEQ constructed a groundwater pump-and-treat system in 2003 to reduce tetrachloroethylene and trichloroethylene contaminant concentrations in the aquifer and to prevent migration of the plume to private drinking water wells. The ADEQ placed a full-scale in situ chemical oxidation system into operation in June 2014. As of December 2015, only two wells are adversely affected by tetrachloroethylene above the Aquifer Water Quality Standard (ADEQ 2016c).

3.19.3.3 Zone-Specific Conditions

East Plains and Kofa Zone

The Proposed Action crosses four groundwater basins, which include the Harquahala, Parker, Phoenix AMA, and Ranegras Plain groundwater basins, in the East Plains and Kofa Zone. No springs are present and very few groundwater wells are located in the study area (Appendix 1, Figure 3.19-2). A summary of groundwater basins, the length of segment through each basin, and the number of wells present in each Proposed Action and Alternative Segments are included in Table 3.19-5.

The Alternative segments in this zone cross the Harquahala, Parker, Phoenix AMA, and Ranegras Plain groundwater basins. No springs are present in the study area. Existing information on groundwater wells indicate that most wells in proximity to the Alternative segments are associated with agriculture and irrigation canals. A summary of groundwater basins, the length of segment through each basin, and the number of wells present in each segment is included on Table 3.19-5.

Quartzsite Zone

The Quartzsite Zone sits entirely in the Parker groundwater basin. Very few groundwater wells are present along the Proposed Action because most of the area is undeveloped. A summary of groundwater basins, the length of segment through each basin, and the number of wells present in each proposed segment are included in Table 3.19-5.

Alternative segments in this zone of the study area are entirely in the Parker groundwater basin. Groundwater wells are more numerous because the Alternative segments cross the developed areas surrounding Quartzsite. A summary of groundwater basins, the length of segment through each basin, and the number of wells present in each Alternative Segment is included in Table 3.19-5.

Copper Bottom Zone

One groundwater basin is crossed in the Copper Bottom Zone portion of the study area, the Parker basin located east of the Colorado River. Very few groundwater wells exist within this portion of the study area. A summary of groundwater basins, the length of segment through each basin, and the number of wells present in the Proposed Action and Alternative segments are included in Table 3.19-5.

Groundwater wells are abundant along I-10 near the Colorado River and within areas of the Palo Verde Irrigation District. A summary of groundwater basins, the length of segment through each basin, and the number of wells present in each Alternative segment is included on Table 3.19-5.

Colorado River and California Zone

The Proposed Action crosses three groundwater basins in this portion of the study area, including the Parker, Palo Verde Valley, and Palo Verde Mesa basins. Groundwater wells are only present within the Palo Verde Mesa basin portions of the study area corridors. A summary of groundwater basins, the length of segment through each basin, and the number of wells present in the Proposed Action and Alternative segments are included in Table 3.19-5.

The Alternative segments also cross the same three groundwater basins. Within the Alternative segments study area corridors, numerous groundwater wells are present across the Palo Verde Valley and Palo Verde Mesa basins. A summary of groundwater basins, the length of segment through each basin, and the number of wells present in each Alternative segment is included on Table 3.19-5.

Table 3.19-5 Groundwater Resources of Proposed Action and Alternative Segments

SEGMENT	ACRES IN BASIN	LENGTH IN BASIN (MILES)	NUMBER OF WELLS
East Plains and Kofa Zone			
p-01	10,303 (H), 2,682 (PHX)	20.7 (H), 5.5 (PHX)	8 (H)
p-02	803 (H)	1.2 (H)	3 (H)
p-03	1,298 (H)	2.1 (H)	—
p-04	2,974 (H)	5.5 (H)	4 (H)
p-05	546 (H), 699 (RP)	0.9 (H), 1.1 (RP)	—
p-06	5,107 (P), 12,489 (RP)	10.3 (P), 25.4 (RP)	4 (P), 6 (RP)
d-01	12,468 (H)	25.2 (H)	30 (H)
i-01	4,329 (H)	8.4 (H)	6 (H)
i-02	1,886 (H)	3.3 (H)	—
i-03	812 (H), 9,152 (RP)	1.4 (H), 18.6 (RP)	7 (RP)
i-04	2,511 (P), 2,820 (RP)	4.9 (P), 5.5 (RP)	1 (RP)
in-01	4,065 (P), 2,907 (RP)	8.0 (P), 5.8 (RP)	2 (P), 2 (RP)

SEGMENT	ACRES IN BASIN	LENGTH IN BASIN (MILES)	NUMBER OF WELLS
x-01	4,125 (H)	7.9 (H)	1 (H)
x-02	3,554 (H)	6.7 (H)	2 (H)
x-03	3,020 (H)	5.6 (H)	4 (H)
x-04	11,267 (RP)	22.6 (RP)	2 (RP)
Alt. SCS Dist. Line	—	3.1 (RP)	—
Quartzsite Zone			
p-07	1,273 (P)	2.1 (P)	1 (P)
p-08	614 (P)	0.7 (P)	1 (P)
i-05	1,673 (P)	2.9 (P)	—
qn-01	577 (P)	0.6 (P)	1 (P)
qn-02	5,493 (P)	10.8 (P)	17 (P)
qs-01	1,769 (P)	3.1 (P)	11 (P)
qs-02	2,631 (P)	4.8 (P)	19 (P)
x-05	5,251 (P)	10.2 (P)	1 (P)
x-06	4,767 (P)	9.2 (P)	1 (P)
x-07	4,024 (P)	7.7 (P)	6 (P)
Copper Bottom Zone			
p-09	3,632 (P)	6.9 (P)	1 (P)
p-10	845 (P)	1.1 (P)	2 (P)
p-11	2,219 (P)	4.0 (P)	2 (P)
p-12	1,573 (P)	2.6 (P)	—
p-13	1,968 (P)	3.5 (P)	—
p-14	742 (P)	0.9 (P)	—
cb-01	1,838 (P)	3.2 (P)	—
cb-02	1,355 (P)	2.2 (P)	2 (P)
cb-03	2,344 (P)	4.3 (P)	2 (P)
cb-04	1,194 (P)	1.9 (P)	—
cb-05	2,441 (P)	4.4 (P)	—
cb-06	1,217 (P)	1.9 (P)	—
i-06	3,740 (P)	7.1 (P)	8 (P)
i-07	3,421 (P)	6.5 (P)	14 (P)
x-08	903 (P)	1.3 (P)	1 (P)

SEGMENT	ACRES IN BASIN	LENGTH IN BASIN (MILES)	NUMBER OF WELLS
Colorado River and California Zone			
Arizona			
p-15e	173 (PVV), 1,482 (P)	0.02 (PVV), 2.8 (P)	—
cb-10	165 (PVV), 1,028 (P)	0.03 (PVV), 1.8 (P)	—
i-08s	141 (PVV), 763 (P)	0.001 (PVV), 1.3 (P)	12 (P)
California			
p-15w	779 (PVM), 2548 (PVV), 163 (P)	2.8 (P)	—
p-16	2,584 (PVM)	4.6 (PVM)	5 (PVM)
p-17	1,748 (PVM)	3.1 (PVM)	—
p-18	1,410 (PVM)	2.4 (PVM)	—
ca-01	1,568 (PVM), 1,931 (PVV)	3.0 (PVM), 3.7 (PVV)	43 (PVM)
ca-02	1,995 (PVM)	3.5 (PVM)	21 (PVM)
ca-04	526 (PVV), 151 (P)	0.8 (PVV)	—
ca-05	1,895 (PVM), 1,585 (PVV)	3.6 (PVM), 3.0 (PVV)	4 (PVM), 3 (PVV)
ca-06	1,570 (PVM)	2.8 (PVM)	2 (PVM)
ca-07	1,902 (PVM)	3.0 (PVM)	2 (PVM)
ca-09	1,709 (PVM)	2.6 (PVM)	—
x-09	542 (PVV)	0.5 (PVV)	1 (PVV)
x-10	960 (PVV)	1.4 (PVV)	2 (PVV)
x-11	1,120 (PVV), 170 (P)	2.1 (PVV)	—
x-12	979 (PVM)	1.4 (PVM)	7 (PVM)
x-13	1,320 (PVM)	2.1 (PVM)	12 (PVM)
x-15	1,104 (PVM)	1.4 (PVM)	—
x-16	1,373 (PVM)	2.3 (PVM)	—
x-19	716 (PVM)	0.9 (PVM)	—

Source: Arizona Department of Water Resources Groundwater Basin Layer and Wells 55 Registry Database (ADWR 2016g, 2016h); CDWR Groundwater Information Center Interactive Map Application (CDWR 2016a).
Notes: H = Harquahala, P = Parker, PVM = Palo Verde Mesa, PVV = Palo Verde Valley, RP = Ranegras Plain, PHX = Phoenix AMA

3.20 CUMULATIVE PROJECTS

3.20.1 Introduction

NEPA identifies three types of potential impacts: direct, indirect, and cumulative. A cumulative impact is the impact on the environment that results from the incremental impact of the Proposed Action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR §1508.7).

The cumulative effects area (CEA) is a geographic area for each environmental topic in which the Project could contribute to cumulative impacts. The geographic area over which cumulative impacts could occur may vary by environmental topic because of the nature and range of potential cumulative effects. Section 3.20.4 discusses the CEA by environmental topic. In general, the CEA is equivalent to the environmental topic's direct and indirect impacts study area.

Within the CEA, a list of past, present, and reasonably foreseeable future projects that could result in related or cumulative impacts was developed. To collect data for the past, present, and reasonably foreseeable future projects list, general plans and other publicly available documents were reviewed, agency and county representatives were contacted, and developers were contacted to gather additional information on planned projects HDR 2017k). Agencies contacted include the BLM field offices, Reclamation, DOD YPG, ASLD, CSLC, as well as Maricopa, La Paz, and Riverside Counties.

A number of planning and programmatic documents were utilized (Table 3.20-1) to assist in the development of past, present, and reasonably foreseeable future projects and provide an understanding of the type and course of potential development regarding both energy infrastructure and renewable project development within the CEAs.

Table 3.20-1 Plans and Environmental Documents Consulted in Cumulative Effects Analysis

FEDERAL PLANS	REGIONAL AND LOCAL PLANS
WWEC Final Programmatic EIS (2008)	California Desert Conservation Area Plan (1980, amended 2015)
Lower Sonoran Resource Management Plan (2012)	Desert Renewable Energy Conservation Plan (2016)
Bradshaw-Harquahala Resource Management Plan (2010)	Maricopa County Comprehensive Plan
Lake Havasu Resource Management Plan (2007)	Riverside County General Plan
Yuma Resource Management Plan (2010)	Riverside County Palo Verde Area Plan
Kofa National Wildlife Refuge Management Plan (1996)	Tonopah/Arlington Area Plan
Yuma Proving Ground Integrated Natural Resources Management Plan (2012)	La Paz County Zoning Plan
	City of Blythe General Plan 2025
	City of Blythe Colorado River Corridor Plan

3.20.2 Cumulative Effects Areas

For most environmental resource areas, the CEA is an area that includes the Proposed Action, the Alternative segments, and a buffer of generally 2 miles from the outermost segments. This was selected because it is equal to the resource's study area and the impacts identified for those resources would not have an effect outside of the area. However, the range of the CEA for some environmental resource areas is larger than the general 2-mile buffer due to the nature of the resource and the impact study area. Air quality has a CEA with a 31-mile radius because air impacts can affect the entire basin in which they occur. The transportation, visual, cultural resources, and Indian tribes' concerns CEA is up to 5 miles from the outermost segment. For the EJ and socioeconomic resource areas, the CEA encompasses the entire three county areas. Table 3.20-2 and Figure 3.20-1 (Appendix 1) present the CEAs for these environmental resource areas.

Table 3.20-2 CEAs by Resource and Rationale

RESOURCE	RATIONALE	CUMULATIVE EFFECTS AREA
Air Quality and Climate Change	Particulates and fugitive dust from construction activities are not expected to travel farther than several miles before settling to the ground, although incremental impacts overall should be considered for nonattainment areas.	31-mile radius (50 km).
Geology and Minerals	The direct and indirect effects of the Proposed Action and Alternative Segments on the majority of these resources would be limited to direct disturbance areas, which are confined within the Proposed Action and Alternative Segments corridors. A 2-mile buffer should encompass potential indirect impacts.	General CEA, which contains the Proposed Action and Alternative Segments surrounded by a 2- mile buffer.
Soils	Erosion from wind and water movement in disturbed areas is expected to be minimal and typically would not extend beyond several miles from the disturbance.	General CEA, which contains the Proposed Action and Alternative Segments surrounded by a 2-mile buffer.
Paleontological Resources	The direct and indirect effects of the Proposed Action and Alternative Segments on the majority of these resources would be limited to direct disturbance areas, which are confined within the Proposed Action and Alternative Segments corridors for the linear facilities. A 2-mile buffer should encompass potential indirect impacts.	General CEA, which contains the Proposed Action and Alternative Segments surrounded by a 2-mile buffer.
Biological Resources	The direct and indirect effects of the Proposed Action and Alternative Segments on the majority of these resources would be limited to direct disturbance areas, which are confined within the Proposed Action and Alternative Segments corridors. A 2-mile buffer should encompass potential indirect impacts.	General CEA, which contains the Proposed Action and Alternative Segments surrounded by a 2-mile buffer.

RESOURCE	RATIONALE	CUMULATIVE EFFECTS AREA
Cultural Resources	Effects of the Proposed Action and Alternative Segments on the majority of these resources would be limited to direct disturbance areas, which are confined within the Proposed Action and Alternative Segments corridors. A 5-mile buffer should encompass potential cumulative impacts, including the extent of the visual analysis and the vantage points from which the Proposed Action and Alternative Segments, and other past, present, and reasonably foreseeable disturbances can be discerned.	General CEA, which contains the Proposed Action and Alternative Segments surrounded by a 5-mile buffer.
Concerns of Indian Tribes	Encompasses the extent of the visual analysis and the vantage points from which the Proposed Action and Alternative Segments, and other past, present, and reasonably foreseeable disturbances can be discerned.	General CEA, which contains the Proposed Action and Alternative Segments surrounded by a 5-mile buffer.
Land Use	The direct and indirect effects of the Proposed Action and Alternative Segments on the majority of these resources would be limited to direct disturbance areas, which are confined within the Proposed Action and Alternative Segments corridors. A 2-mile buffer should encompass potential indirect impacts.	General CEA, which contains the Proposed Action and Alternative Segments surrounded by a 2-mile buffer.
Grazing and Rangeland	The direct and indirect effects of the Proposed Action and Alternative Segments on the majority of these resources would be limited to direct disturbance areas, which are confined within the Proposed Action and Alternative Segments corridors. A 2-mile buffer should encompass potential indirect impacts.	General CEA, which contains the Proposed Action and Alternative Segments surrounded by a 2-mile buffer.
Recreation and Special Designations, Management Allocations, and Wilderness Resources	The direct and indirect effects of the Proposed Action and Alternative Segments on the majority of these resources would be limited to direct disturbance areas, which are confined within the Proposed Action and Alternative Segments corridors. A 2-mile buffer should encompass potential indirect impacts.	General CEA, which contains the Proposed Action and Alternative Segments surrounded by a 2-mile buffer.
Noise	The direct and indirect effects of the Proposed Action and Alternative Segments on the majority of these resources would be limited to direct disturbance areas, which are confined within the Proposed Action and Alternative Segments corridors. A 2-mile buffer should encompass potential indirect impacts.	General CEA, which contains the Proposed Action and Alternative Segments surrounded by a 2-mile buffer.
Hazardous Materials and Hazardous and Solid Waste	The direct and indirect effects of the Proposed Action and Alternative Segments on the majority of these resources would be limited to direct disturbance areas, which are confined within the Proposed Action and Alternative Segments corridors. A 2-mile buffer should encompass potential indirect impacts.	General CEA, which contains the Proposed Action and Alternative Segments surrounded by a 2-mile buffer.

RESOURCE	RATIONALE	CUMULATIVE EFFECTS AREA
Public Health and Safety (EMFs and Fire)	The direct and indirect effects of the Proposed Action and Alternative Segments on the majority of these resources would be limited to direct disturbance areas, which are confined within the Proposed Action and Alternative Segments corridors. A 2-mile buffer should encompass potential indirect impacts.	General CEA, which contains the Proposed Action and Alternative Segments surrounded by a 2-mile buffer.
Socioeconomics Environmental Justice	Socioeconomics – The Proposed Action and Alternative Segments occur within these counties, and the use of the county boundaries for the CEA boundary allows for the efficient gathering of socioeconomic data. Environmental Justice – Communities most proximate to the Proposed Action and Alternative Segments; census block groups and counties associated with those communities.	Maricopa, La Paz, and Riverside Counties, and Block Groups.
Transportation and Traffic	Transportation into the general Project Area would primarily be on existing and established access routes. Transportation should not be noticeably affected outside of these major roads.	General CEA, which contains the Proposed Action and Alternative Segments surrounded by a 5-mile buffer.
Visual Resources	Encompasses the extent of the farthest KOP and the vantage points from which the Proposed Action and Alternative Segments, as well as other past, present, and reasonably foreseeable disturbances can be discerned.	General CEA, which contains the Proposed Action and Alternative Segments surrounded by a 5-mile buffer.
Water Resources	Erosion from wind and water movement in disturbed areas is expected to be minimal and typically would not extend beyond several miles from the disturbance.	Any surface waters or groundwater aquifers crossed by or contained within the general CEA, which contains the Proposed Action and Alternative Segments surrounded by a 2-mile buffer.

3.20.3 Past, Present, and Reasonably Foreseeable Actions

Land ownership plays an important role in how land is managed and the types of activities that take place. All CEAs for the Project include a mix of Federal, state, Indian, and private lands. Public lands managed by the BLM are used for a variety of purposes including dispersed recreation, wildlife, livestock grazing, mining, and transportation and utility corridors. Public lands are also managed for special values, including the Big Horn Mountains WA, Hummingbird Springs WA, New Water Mountains WA, Kofa NWR, Dripping Springs ACEC, and Mule Mountains ACEC. Public lands managed by Reclamation are managed to operate dams, power plants, and canals providing water and hydroelectric power. State trust lands are generally managed for commercial uses that generate revenue for the benefit of Arizona or California schools, or managed for wildlife (and their habitat), or recreation. State trust lands are also developed for public purposes such as roads, utilities, and other infrastructure. Private lands have been developed for residential and commercial purposes, agriculture, roads, highways, landfills, airports, etc. The lands included in all of the CEAs contain a mixture of undeveloped lands, agriculture, cities and towns, roads and highways, utilities, commercial and residential development, military facilities, and mining.

Tables 3.20-3a and b details the land ownership by CEA. The information in Tables 3.20-3a and b is referred to throughout the discussions by resource topic in the proceeding sections.

Past, or existing, land uses from which disturbance can be inferred have been quantified (Tables 3.20-4a and b) for the General CEA (2-mile) and the 5-mile CEA. These calculations provide a baseline for general conditions within the CEAs. Specific present and reasonably foreseeable future projects that could contribute to cumulative impacts are listed in Table 3.20-5 and Table 3.20-6. These tables indicate the project name and project type, as well as its location and status. Each project is identified by a map number, keyed to Figure 3.20-1 (Appendix 1). This figure shows the locations of projects that could result in impacts within the CEAs.

Collectively, these projects represent known and anticipated activities that may occur in the general Project vicinity and that have the potential to contribute to a cumulative impact. Because the Project would be linear, most of the projects in Table 3.20-5 and Table 3.20-6 would not contribute to cumulative impacts along the entire route. These projects are limited in their geographic extent. Others, such as the DPV1 and the El Paso National Gas pipeline, are linear facilities that would parallel or overlap with segments of the Project over great geographic distances, in multiple counties. As shown on Figure 3.20-1 (Appendix 1), the majority of the planned projects in the CEA are located in Riverside County, California.

3.20.3.1 East Plains and Kofa Zone

As noted in Tables 3.20-4a and 3.20-4b, the land uses in this zone include a mix of undeveloped lands, some agriculture, infrastructure and industrial development, and residential development. For example, within the East Plains and Kofa Zone CEAs, which include portions of Maricopa and La Paz Counties, there are two existing transmission lines, five actively operating power plants, one actively operating natural gas pipeline that may occur in the general Project vicinity, a mine, and an operating landfill. The DPV1 begins at the Palo Verde Hub in Maricopa County and extends through La Paz County to the Colorado River Substation in Riverside County. An additional transmission line includes the Harquahala to Hassayampa 500 kV transmission line. The Harquahala Power Plant is an existing 1,092 MW combined-cycle gas plant located in Maricopa County within the 2-mile and 5-mile CEAs. Additionally, the Red Hawk 1,140 MW, the Mesquite Generating Station Block 2 692 MW, and the Arlington Valley Energy Facility 580 MW are all existing natural gas plants and the Palo Verde 3,937 MW nuclear power plant are all in Maricopa County within the Air Quality CEA. The Kinder Morgan – El Paso Natural Gas System is a gas pipeline located in the CEA in both Maricopa and La Paz Counties. The Plomosa Quarry is an existing landscape rock mine. In addition to these projects, Tables 3.20-4a and b presents general land uses. Two wildlife improvement projects, the Sonoran pronghorn 10-J release and the Catchment #726 replacement project have occurred. The Sonoran pronghorn captive breeding and release facility is in the King Valley on the Kofa NWR. The other wildlife project was a wildlife water source replacement.

An associated solar facility, the Harquahala Solar Project, is planned for development on the Harquahala Power Plant site although no specific schedule has been set. In May 2017, a bill (H.R. 2630) was introduced in the House of Representatives that would allow La Paz County to purchase

8,000 acres of BLM-administered land. After acquisition of the land, La Paz County would pursue utility-scale solar energy production with private developers to help create new sources of revenue in the county. This 8,000-acre BLM parcel is located immediately south of I-10 in the Hovatter Road off-ramp area.

3.20.3.2 Quartzsite Zone

Land uses in this zone are dominated by undeveloped lands (>90 percent) with limited residential, commercial, and infrastructure developments (Tables 3.20-4a and b). In addition to the DPV1 line and the Kinder Morgan – El Paso Natural Gas System mentioned previously, other linear facilities include the WAPA 161kV transmission line. The Town of Quartzsite is currently in the planning stages of the Quartzsite Wastewater Treatment Plant renovations project

In addition, there are reasonably foreseeable projects including one proposed solar facility and one proposed mine. The Quartzsite Solar Energy Project proposal is a 1,675-acre solar project on BLM-administered land, approximately 10 miles north of Quartzsite, developed by Quartzsite Solar Energy, LLC. The Plomosa 9 Placer Claim, owned by Jackpot Minerals LLC, is a 20-acre mining claim within the Plomosa Mountains just southeast of Quartzsite.

3.20.3.3 Copper Bottom Zone

Within the Copper Bottom zone portion of the CEAs, land uses include a mix of military, Indian reservation, and undeveloped public lands with limited amounts of residential and infrastructure development (Tables 3.20-4a and b). Existing projects include the DPV1 line and the Kinder Morgan – El Paso Natural Gas System. The Ehrenberg Wash Pit is a sand, gravel, and rock product mine, just east of Ehrenburg, with a General Air Quality Emissions Control Permit for Crushing and Screening Plants issued by the ADEQ. The YPG is located in this zone.

The West Port Gold Project in La Paz County is an open pit mine, located approximately 1 mile north of I-10 and about 6 miles west of Quartzsite, received its use and occupancy permit February 23, 2017.

3.20.3.4 Colorado River and California Zone

Land uses in the Colorado River and California Zone portion of the CEAs are dominated by agriculture, with more acres of commercial, residential, industrial, and infrastructure developments than the other zones (Tables 3.20-4a and b). It contains the most existing and reasonably foreseeable future projects that may occur in the general Project vicinity and that have the potential to contribute to a cumulative impact. There are six existing transmission lines, three natural gas pipelines, a power plant, and seven active solar facilities within the CEAs. The transmission lines include the DPV1, Blythe to Headgate Rock, Gold Mine to Blythe, Niland to Blythe, Julian Hinds to Buck, and Blythe to Eagle Mountain; this does not include the numerous local distribution/power lines or gen-tie lines (i.e., generator interconnecting lines) connecting solar facilities to substations. Existing solar facilities include Venable Solar 1 and 2, Blythe Solar Power Project, Blythe Solar Generating Facility, McCoy Solar Energy Project, Genesis Solar Energy Project, and the Palo Verde College solar facility. The Sempra – Southern California Gas Co. Gas Pipeline and North Baja Pipelines, as well as a portion of the El Paso Natural Gas Pipeline, are located in Riverside County. The Blythe Energy Center is an existing power plant, while the Blythe

Energy Power Plant/Sonoran Energy Project is a proposed power plant. The three proposed solar facilities include the Blythe Mesa Solar Project, Desert Quartzite Solar Project, and the Crimson Solar Project; these would all include gen-tie lines as well.

Table 3.20-3a Land Ownership within the 2-Mile CEA

LAND OWNERSHIP	EP&K		QTZ		CB		CR&CA		TOTAL	
	AC	%[1]	AC	%[1]	AC	%[1]	AC	%[1]	AC	%[2]
BLM	252,081.7	55.7	68,410.7	92.1	49,861.9	56.3	25,333.1	26.3	395,687.5	55.6
Reclamation	1,600.5	0.4	0	0	8,877.9	10.0	2,349.7	2.4	12,828.1	1.8
USFWS	67,304.2	14.9	1,279.2	1.7	0	0	0	0	68,583.4	9.6
Military	0	0	0	0	14,618.1	16.5	0	0	14,618.1	2.1
Indian Lands	0	0	0	0	8,718.0	9.9	0	0	8,718.0	1.2
County	0	0	0	0	15.5	<0.1	0	0	15.5	<0.1
Private	76,673.3	17.0	4,206.1	5.7	1,876.3	2.1	66,178.3	68.6	148,933.9	20.9
State - Arizona	54,623.9	12.1	401.3	0.5	4,534.5	5.1	2,579.3	2.7	62,138.7	8.7
State - California	n/a		n/a		n/a		49.6	<0.1	49.2	<0.1
Total All Owners	452,283.7	100	74,297.2	100	88,502.2	100	96,490.0	100	711,573.1	100

[1]Percentages based on the total acres within the zone within the 2-Mile CEA.

[2]Percentages based on the total acres within the 2-Mile CEA.

Table 3.20-3b Land Ownership within the 5-Mile CEA

LAND OWNERSHIP	EP&K		QTZ		CB		CR&CA		TOTAL	
	AC	%[1]	AC	%[1]	AC	%[1]	AC	%[1]	AC	%[2]
BLM	418,928.9	57.2	96,331.3	93.5	65,880.7	44.2	74,568.3	38.9	655,709.2	55.8
Reclamation	1,600.5	0.2	0	0	8,877.9	6.0	2,631.1	1.4	13,109.5	1.1
USFWS	113,892.0	15.6	2,116.6	2.1	0	0	0	0	116,008.6	9.9
Military	0	0	0	0	39,865.9	26.8	0.9	<0.1	39,866.8	3.4
Indian Lands	0	0	0	0	26,996.5	18.1	961.2	0.5	27,957.7	2.4
County	0	0	0	0	15.5	<0.1	0	0	15.5	<0.1
Local or State Park	0	0	0	0	0	0	83.9	<0.1	83.9	<0.1
Private	122,080.4	16.7	4,206.1	4.1	2,761.7	1.9	108,569.7	56.7	237,617.8	20.2
State (Arizona)	75,488.6	10.3	401.3	0.4	4,637.8	3.1	3,840.0	2.0	84,350.6	7.2%
State (California)	n/a		n/a		n/a		907.1	0.5	924.2	<0.1
Total All Owners	731,990.4	100.0	103,055.2	100.0	149,035.6	100.0	191,562.2	100.0	1,175,643.6	100.0

[1]Percentages based on the total acres within the zone within the 5-Mile CEA.

[2]Percentages based on the total acres within the 5-Mile CEA.

Table 3.20-4a Quantifiable Land Use within the 2-Mile CEA

LAND USE	EP&K ZONE		QTZ ZONE		CB ZONE		CR&CA ZONE		TOTAL	
	ACRES	%[1]	ACRES	%[1]	ACRES	%[1]	ACRES	%[1]	ACRES	%[2]
Agriculture[3]	742.0	0.2	0	0	0	0	43,234.6	44.8	43,976.6	6.2
Public Lands (BLM) undeveloped or unspecified use	253,438.7	56.0	67,739.7	91.2	49,358.9	55.8	16,472.0	17.1	387,009.3	54.4
Reclamation[3]	1,570.1	0.4	0	0	8,744.1	9.9	2,321.8	2.4	12,645.8	1.8
Commercial[3]	0	0	1,091.9	1.5	0	0	1,861.0	1.9	2,953.0	0.4
County	0	0	0	0	15.5	<0.1	0	0	15.5	<0.1
Indian Reservation	0	0	0	0	8,633.4	9.8	0	0	8,633.4	1.2
Industrial[3]	1,874.0	0.4	41.2	<0.1	0	0	1,346.7	1.4	3,261.9	0.5
Local	0	0	0	0	0	0	527.4	0.6	527.4	0.1
Military	0	0	0	0	14,663.7	16.6	0	0	14,663.7	2.1
Mixed Use[3, 4]	2,789.6	0.6	143.3	0.2	931.9	1.1	679.7	0.7	4,544.5	0.6
Open Space	68.1	<0.1	3.6	0	0	0	5,559.0	5.8	5,630.7	0.8
Open Water	212.4	<0.1		0	0	0		0	212.4	<0.1
Public/Semi-public[3]	0	0	35.6	<0.1	0	0	2,613.6	2.7	2,649.1	0.4
Urban Residential[3]	2,368.9	0.5	2,326.5	3.1	244.3	0.3	3,049.1	3.2	7,988.8	1.1
Rural Residential[3]	63,349.2	14.0	83.7	0.1	463.8	0.5	1,922.8	2.0	65,819.5	9.3
Solar Facility[3]	0	0	0	0	0	0	12,291.7	12.7	12,291.7	1.7
Special Designation Lands	0	0	0	0	0	0	39.3	<0.1	39.3	<0.1
State Lands	54,178.3	12.0	389.5	0.5	4,446.2	5.0	2,563.5	2.7	61,557.4	8.7
Transmission Lines[3,5]	486.9	0.1	83.2	0.1	115.2	0.1	309.8	0.3	995.0	0.1
Transportation[3,5]	4,394.3	1.0	1,094.0	1.5	885.2	1.0	1,698.1	1.8	8,071.2	1.1
USFWS	66,811.5	14.8	1,265.5	1.7	0	0	0	0	68,077.0	9.6
Totals	452,283.7	100.0	74,297.2	100.0	88,502.2	100.0	96,490.0	100.0	711,573.1	100.0
Total Acres Disturbance[3]	77,575.0	17.2	4,899.4	6.6	11,384.5	12.9	71,328.9	73.9	165,197.1	23.2

[1]Percentages based on the total acres within the zone within the 2-Mile CEA.

[2] Percentages based on the total acres within the 2-Mile CEA.

[3]For purposes of quantification, these categories are considered disturbances.

[4]Mixed use includes multi-family commercial use, employment centers, neighborhood commercial, planning development, and undetermined uses.

[5]Road centerlines were buffered from 10 (i.e., driveway) to 60 feet (i.e., freeway) depending on road type; transmission lines assume 50-foot ROW.

Table 3.20-4b Quantifiable Land Use within the 5-Mile CEA

LAND USE	EP&K ZONE		QTZ ZONE		CB ZONE		CR&CA ZONE		TOTAL	
	ACRES	%[1]	ACRES	%[1]	ACRES	%[1]	ACRES	%[1]	ACRES	%[2]
Agriculture[3]	2,346.1	0.3	0	0	0	0	74,450.8	38.9	76,796.9	6.5
Public Lands (BLM) undeveloped or unspecified use	421,021.2	57.5	95,469.7	92.6	65,340.5	43.8	54,592.5	28.5	636,423.9	54.1
Reclamation[3]	1,570.1	0.2	0	0	8,744.1	5.9	2,602.7	1.4	12,916.9	1.1
Commercial[3]	0	0	1,091.9	1.1	0	0	3,523.9	1.8	4,615.8	0.4
County	0	0	0	0	15.5	<0.1	0	0	15.5	0
Indian Reservation	0	0	0	0	26,764.2	18.0	808.4	0.4	27,572.5	2.4
Industrial[3]	1,874.0	0.3	41.2	<0.1	0	0	1,358.3	0.7	3,273.6	0.3
Local	0	0	0	0	38.6	<0.1	713.0	0.4	751.6	0.1
Military	0	0	0	0	39,884.3	26.8	0.8	<0.1	39,885.1	3.4
Mixed Use[3,4]	3,247.7	0.4	143.3	0.1	1,396.5	0.9	1,223.3	0.7	6,010.8	0.5
Open Space	190.2	<0.1	3.6	<0.1	8.0	<0.1	9,263.5	4.8	9,465.3	0.8
Open Water	212.4	<0.1	0	0	0	0	52.8	<0.1	265.2	<0.1
Public/Semi-public[3]	0	0	35.6	<0.1	0	0	3,886.1	2.0	3,921.6	0.3
Urban Residential[3]	15,248.2	2.1	2,326.5	2.3	250.0	0.2	4,671.3	2.4	22,496.1	1.9
Rural Residential[3]	91,255.9	12.5	83.7	0.1	725.6	0.5	3,226.7	1.8	95,291.8	8.1
Solar Facility[3]	0	0	0	0	0	0	23,399.6	12.2	23,399.6	2.0
Special Des. Lands	0	0	0	0	0	0	211.9	0.1	211.9	<0.1
State Lands	75,010.2	10.3%	389.5	0.4	4,536.5	3.0	4,538.9	2.4	84,475.1	7.2
Transmission Lines[3, 5]	523.3	0.1	101.8	0.1	115.2	0.1	366.9	0.2	1,107.2	0.1
Transportation[3,5]	6,358.4	0.9	1,269.8	1.2	1,216.7	0.8	2,670.9	1.4	11,515.8	1.0
USFWS	113,132.7	15.5	2,098.6	2.0	0	0	0	0	115,231.3	9.8
Totals	731,990.4	100.0	103,055.2	100.0	149,035.8	100.0	191,562.3	100.0	1,175,643.6	100.0
Total Acres Disturbance[3]	122,423.7	16.7	5,093.8	4.9	12,448.1	8.4	121,380.5	63.4	261,346.1	22.2

[1]Percentages based on the total acres within the zone within the 5-Mile CEA.

[2]Percentages based on the total acres within the 5-Mile CEA.

[3]For purposes of quantification, these categories are considered disturbances.

[4]Mixed use includes multi-family commercial use, employment centers, neighborhood commercial, planning development, and undetermined uses.

[5]Road centerlines were buffered from 10 (i.e., residential) to 60 feet (i.e., freeway) depending on road type; transmission lines assume 50-foot ROW.

Table 3.20-5 BLM Authorized and Other Known Projects

MAP ID # (FIG. 3.20-1) / ZONE	NAME	COUNTY	PROJECT STATUS	TYPE	DESCRIPTION	2-MILE CEA	5-MILE CEA	AQ OR SOCIO CEA
1 All zones	Devers-Palo Verde No. 1 and 2 Transmission Project	Maricopa, La Paz, and Riverside	active	transmission line	Facility Owner/Developer: Southern California Edison Acreage/Mileage and Land Ownership: approximately 230 miles through BLM, USFWS, state trust, and private lands Technology Type: two parallel 500kV transmission lines Expansion Construction Schedule and/or Permitting Milestones: n/a General Overview: two parallel existing 500kV transmission lines extending from the PVNGS and Harquahala Generating Station in Maricopa County, Arizona to the Devers Substation in Riverside County, California; No. 1 was completed in 1982 and No. 2 was completed in 2013.	X	X	X
2 EP&K zone	Harquahala Power Plant	Maricopa	active	power plant	Facility Owner/Developer: Talen Energy Corporation Acreage/Mileage and Land Ownership: approximately 120 acres of private lands Technology Type: three-unit 1,092 MW combined cycle, natural gas–fired plant General Overview: three-unit 1,092 MW combined cycle, natural gas–fired plant built in 2004 and purchased from Mach Gen LLC by Talen Energy Corp. in 2015.	X	X	X
28 EP&K zone	Red hawk	Maricopa	active	power plant	Facility Owner/Developer: Arizona Public Service Co. Technology Type: 1,140 MW combined cycle, natural gas–fired plant			X
29 EP&K zone	Mesquite Generating Station Block 2	Maricopa	active	power plant	Facility Owner/Developer: CAMS Technology Type: 692 MW combined cycle, natural gas–fired plant			X

MAP ID # (FIG. 3.20-1) / ZONE	NAME	COUNTY	PROJECT STATUS	TYPE	DESCRIPTION	2-MILE CEA	5-MILE CEA	AQ OR SOCIO CEA
30 EP&K zone	Arlington Valley Energy Facility	Maricopa	active	power plant	Facility Owner/Developer: Arlington Valley LLC Technology Type: 580 MW combined cycle, natural gas–fired plant			X
31 EP&K zone	Palo Verde	Maricopa	active	power plant	Facility Owner/Developer: APS Technology Type: 3,937 MW nuclear plant			X
QTZ zone	WAPA	Yuma and La Paz	active	transmission line	Technology type: 161-kV transmission line General Overview: transmission line originating at the Parker Dam hydroelectric facility heading south past Quartzsite to the Kofa substation on the YPG.	X	X	X
4 All zones	El Paso Natural Gas Pipeline System	Maricopa and La Paz	active	interstate natural gas pipeline	Facility Owner/Developer: Kinder Morgan, Inc. Acreage and Land Ownership: 10,200 miles on unknown land Technology Type: 5.65 billion cubic feet per day capacity natural gas pipeline General Overview: approximately 10,200-mile El Paso Natural Gas Pipeline System transports natural gas from the San Juan, Permian and Anadarko basins to California, Arizona, Nevada, New Mexico, Oklahoma, Texas, and northern Mexico.	X	X	X
7 EP&K zone	Sonoran Pronghorn 10-J Release	La Paz	active	wildlife reintroduction program	Facility Owner/Developer: USFWS Acreage and Land Ownership: 0.5 square-mile (320 acres) captive breeding pen in King Valley of the USFWS Kofa NWR General Overview: this final rule sets in motion the reintroduction of Sonoran pronghorns to establish up to two new populations as envisioned by the recovery plan; the final rule includes provisions to construct a captive breeding and release facility in King Valley on the Kofa NWR in La Paz County, Arizona.	X	X	X

MAP ID # (FIG. 3.20-1) / ZONE	NAME	COUNTY	PROJECT STATUS	TYPE	DESCRIPTION	2-MILE CEA	5-MILE CEA	AQ OR SOCIO CEA
32 EP&K zone	Plomosa Mine Quarry	La Paz	active	mine	Facility Owner/Developer: Pioneer Landscaping Materials Acreage and Land Ownership: 28.7 acres of BLM-administered lands Technology Type: open pit mining via drilling and blasting. General Overview: Mined materials (quartz-based decorative rock) are crushed, screened, and stockpiled. Approximately 5 to 10, 25-ton truck loads of crushed rock per day transported off site (125-250 tons per day). On rare occasions, up to 30 trucks may be transporting material off site.	X	X	X
12 CB zone	Ehrenberg Wash Pit Expansion	La Paz	active	mine	Facility Owner/Developer: Mineral Aggregate Recycling Services, Inc. Acreage and Land Ownership: expansion of the existing BLM owned 40-acre open pit by 20 acres Technology Type: competitive sale of rock product from open pit mine General Overview: wash plant is currently operational. (C. Scott, Mineral Aggregate Recycling Services, Inc., personal communication August 31, 2016); the project can produce up to 30,000 tons of rock product per year for the duration of ten years; approximately five to ten 25-ton truck loads of rock product can be shipped per day, and up to 30 deliveries per day during peak demand.	X	X	X
13 CR&CA zone	Venable Solar 1	Riverside	active	solar facility	Facility Owner/Developer: Venable Solar LLC Technology Type: 1.5 MW solar photovoltaic facility General Overview: solar photovoltaic project near Blythe, south of I-10 near US 95; Commercial Operations Date: 4/13/2015.	X	X	X

MAP ID # (FIG. 3.20-1) / ZONE	NAME	COUNTY	PROJECT STATUS	TYPE	DESCRIPTION	2-MILE CEA	5-MILE CEA	AQ OR SOCIO CEA
14 CR&CA zone	Venable Solar 2	Riverside	active	solar facility	Facility Owner/Developer: Venable Solar LLC Technology Type: 1.5 MW solar photovoltaic facility General Overview: solar photovoltaic project near Blythe, south of I-10 near US 95; Commercial Operations Date: 4/14/2015.	X	X	X
15 CR&CA zone	Sempra – Southern California Gas Co. Gas Pipeline	Riverside	active	natural gas pipeline	Facility Owner/Developer: Sempra Energy Utility - Southern California Gas Co.	X	X	X
16 CR&CA zone	North Baja Pipeline	Riverside	active	interstate natural gas pipeline	Facility Owner/Developer: TransCanada - North Baja Pipelines LLC Acreage and Land Ownership: 86 miles in US Technology Type: 500-600 million cubic feet per day natural gas pipeline General Overview: The North Baja Pipeline system consists of 86 miles of pipeline receiving natural gas from an interconnection with the El Paso Natural Gas Pipeline at Ehrenberg, Arizona, that sources natural gas primarily from the West Texas and Southern Rocky Mountain supply regions. North Baja has a design capacity of 500 million cubic feet per day for southbound transportation and 600 million cubic feet per day for northbound transportation. Given the bidirectional capability modifications completed in 2008, North Baja is also able to transport natural gas northbound at Ogilby, California, and receive natural gas sourced from the Energia Costa Azul liquefied natural gas terminal in Mexico.	X	X	X

MAP ID # (FIG. 3.20-1) / ZONE	NAME	COUNTY	PROJECT STATUS	TYPE	DESCRIPTION	2-MILE CEA	5-MILE CEA	AQ OR SOCIO CEA
17 CR&CA zone	Blythe Energy Center	Riverside	active	power plant	Facility Owner/Developer: AltaGas Acreage and Land Ownership: privately held 76-acre site Technology type: 507 MW combined cycle, natural gas-fired plant General Overview: The Blythe Energy Center was acquired by AltaGas in 2014 and is a 507 MW natural gas-fired combined cycle power plant in Blythe, California. The facility is secured by a 7-year power purchase agreement (PPA) with Southern California Edison, is directly connected to Southern California Gas, and interconnects to the power grid via a 67-mile transmission line.	X	X	X
34 CR&CA	Palo Verde College solar facility	Riverside	active	Solar facility	Facility Owner/Developer: SSA Solar of CA 2 LLC Technology Type: 1.2 MW photovoltaic	X	X	X
CR&CA	Blythe to Headgate Rock	Riverside and La Paz	active	transmission line	Facility Owner/Developer: WAPA Technology type: 161 kV transmission line General Overview: transmission line originating at the Headgate Rock hydroelectric power plant on CRIT lands. Heads south into Blythe.	X	X	X
EP&K	Harquahala to Hassayampa	Maricopa	active	transmission line	Facility Owner/Developer: APS Technology type: 500 kV transmission line General Overview: transmission line originating from the Harquahala Generating Project heading southeast to the Hassayampa substation near the Mesquite Generating Station.	X	X	X
CR&CA	Gold Mine to Blythe	Riverside	active	transmission line	Facility Owner/Developer: Imperial Irrigation District Technology type: 161 kV transmission line General Overview: transmission line originating at the Gold Mine heading to Blythe	X	X	X

MAP ID # (FIG. 3.20-1) / ZONE	NAME	COUNTY	PROJECT STATUS	TYPE	DESCRIPTION	2-MILE CEA	5-MILE CEA	AQ OR SOCIO CEA
CR&CA	Niland to Blythe	Riverside	active	transmission line	Facility Owner/Developer: AZUSA Light & Power Technology type: 161 kV transmission line General Overview: transmission line originating at the Niland Gas Turbine Plant heading northeast to Blythe.	X	X	X
CR&CA	Julian Hinds to Buck	Riverside	active	transmission line	Facility Owner/Developer: AZUSA Light & Power Technology type: 230 kV transmission line General Overview: transmission line originating from the Blythe Energy natural gas power plant. Continues west south of I-10 then crosses north into the Eagle Mountains.	X	X	X
CR&CA	Blythe to Eagle Mountain Transmission Line	Riverside	active	Transmission line	Facility Owner/Developer: Southern California Edison Technology type: 161 kV transmission line General Overview: transmission line originating from Blythe and continues west south of I-10 then crosses north into the Eagle Mountains.	X	X	X
20 CR&CA	Blythe Solar Power Project	Riverside	active	solar facility	Facility Owner/Developer: NextEra Energy Resources, LLC - NextEra Blythe Solar Acreage and Land Ownership: 4,138 BLM acres (BLM Right-of-Way Grant No. CACA–048811) Technology Type: 4-unit 485 MW solar photovoltaic facility Expansion Construction Schedule and/or Permitting Milestones: The construction of Units 3 and 4 is currently on hold General Overview: A Next Era Energy Resources, LLC, 485 MW solar project on 4,138 acres 2 miles north of I-10 and 8 miles west of Blythe in unincorporated Riverside County, California. The modified Blythe Solar Power Project was approved on August 1, 2014. NextEra Blythe Solar Energy Center, LLC (the current Project applicant), has proposed conversion of the previously approved project from thermal solar to photovoltaic solar		X	X

MAP ID # (FIG. 3.20-1) / ZONE	NAME	COUNTY	PROJECT STATUS	TYPE	DESCRIPTION	2-MILE CEA	5-MILE CEA	AQ OR SOCIO CEA
					technology. A 230kV generation tie-line will connect the solar energy generating facility with the Colorado River Substation, located 5 miles to the southwest. Units 1 and 2 are now operational (CEC 2017).			
21 CR&CA zone	Blythe Solar Generating Facility	Riverside	active	solar facility	Facility Owner/Developer: NRG Energy, Inc. Technology Type: 21 MW solar photovoltaic facility General Overview: NRG Energy, Inc., through NRG Renew started commercial operation in December 2009 for the Blythe Solar Generating Facility, a 21 MW solar photovoltaic solar facility in Blythe, California. Project completed in 2009.	X	X	X
23 CR&CA zone	McCoy Solar Energy Project	Riverside	active	solar facility	Facility Owner/Developer: NextEra Energy Resources, LLC - McCoy Solar, LLC Acreage and Land Ownership: 7,700 acres of BLM-administered land and 470 acres of private land Technology Type: 750 MW solar photovoltaic facility General Overview: A 750 MW photovoltaic solar project on 7,700 acres of BLM-administered land and 470 acres of private land 13 miles northwest of Blythe proposed by McCoy Solar, LLC, a subsidiary of Next Era Energy Resources. The project connects with the Colorado River Substation. The project is complete (G. Kline, BLM, personal communication September 19, 2016).			X

MAP ID # (FIG. 3.20-1) / ZONE	NAME	COUNTY	PROJECT STATUS	TYPE	DESCRIPTION	2-MILE CEA	5-MILE CEA	AQ OR SOCIO CEA
25 CR&CA zone	Genesis Solar Energy Project	Riverside	active	solar facility	Facility Owner/Developer: NextEra Energy Resources, LLC - Genesis Solar, LLC Acreage and Land Ownership: unknown acreage of BLM-administered land Technology Type: 2-unit concentrated solar electric generating facility General Overview: The Genesis Solar Energy Project is operated by Genesis Solar, LLC, a subsidiary of NextEra Energy Resources, LLC. The project is a concentrated solar electric generating facility located in Riverside County, California. The project consists of two independent solar electric generating facilities with a nominal net electrical output of 125 MW each, for a total net electrical output of 250 MW. The project is located approximately 25 miles west of Blythe, California, on lands managed by the BLM. Construction was completed in April 2014. The facility is in full operation. (BLM Palm Springs-South Coast Field Office 2016).		X	X
ASLD Various Parcels EP&K, QTZ, and CB zones	Grazing Leases	Mariposa and La Paz	current	Grazing Leases	Facility Owner/Developer: ASLD Acreage and Land Ownership: 43 leases of various acreage; parcels on state trust lands General Overview: 43 grazing leases along the project route on lands administered by the ASLD.	X	X	X

MAP ID # (FIG. 3.20-1) / ZONE	NAME	COUNTY	PROJECT STATUS	TYPE	DESCRIPTION	2-MILE CEA	5-MILE CEA	AQ OR SOCIO CEA
Yuma Proving Grounds CB zone	YPG	Yuma and La Paz	active	military installation	Facility Owner/Developer: US DOD - US Army Acreage and Land Ownership: 1,307.8 square miles of DOD land Technology Type: military testing site General Overview: The primary mission of the YPG is to ensure that the weapon systems and equipment issued to soldiers function safely and as intended. However, the land is not entirely restricted to these uses. In coordination with the AGFD, the YPG administers hunting in certain parts of the installation.	X	X	X
continuous along the Colorado River CR&CA zone	Colorado River Bankline Repairs	La Paz and Riverside	as needed basis	maintenance activity	Facility Owner/Developer: Reclamation Acreage and Land Ownership: unknown; continuous along the Colorado River Technology Type: n/a; maintenance activity General Overview: Under the Colorado River Front Work and Levee System Act of 1946 (as amended) Reclamation has responsibility along the lower Colorado River for flood control. The Act authorizes Reclamation to improve, stabilize, and maintain the river channel so that it can handle flows resulting from flood control operations and floods of local origin. In the Palo Verde Division (Blythe CA area), the following activities are continuous along the river: reinforcing bankline and levees by placing riprap material, removing (sediment) wash fans, maintaining river access roads, and conducting excavation activities to remove excess sediment along the river in critical areas in order to protect Reclamation facilities.	X	X	X

MAP ID # (FIG. 3.20-1) / ZONE	NAME	COUNTY	PROJECT STATUS	TYPE	DESCRIPTION	2-MILE CEA	5-MILE CEA	AQ OR SOCIO CEA
continuous along the Colorado River CR&CA zone	Palo Verde Backwaters Maintenance Activities	La Paz and Riverside	as needed basis	maintenance activity	Facility Owner/Developer: Reclamation Acreage and Land Ownership: unknown; continuous along the Colorado River Technology Type: n/a; maintenance activity General Overview: Reclamation monitors various backwaters along the lower Colorado River (Blythe CA area) located south of I-10, to address concerns related to the management of the backwaters and maintenance requirements. All work is conducted with previously impacted areas (i.e. replacing culverts and cleaning out the inlets and outlets of the backwaters).	X	X	X
27 EP&K	Catchment #726 Replacement	La Paz	active	Wildlife improvement	Facility Owner/Developer: AGFD Acreage and Land Ownership: BLM, Yuma FO General Overview: AGFD Region IV proposes to replace the #726 wildlife water above ground system with a new water system at the same location within the Eagletail Mountain Wilderness. This water is a grandfathered structure that predates the Eagletail Mountain Wilderness designation that occurred on November 29, 1990. It is also an important source of water for desert bighorn sheep in the Eagletail Mountains (GMU 41), as well as other game and nongame species. Currently, this water development is a rain apron and steel storage tank system. It uses slick rock as an apron to capture water.		X	X

EP&K – East Plains and Kofa; QTZ – Quartzsite; CB – Copper Bottom; CR&CA – Colorado River and California

Table 3.20-6 Reasonably Foreseeable Future Projects

MAP ID # (FIG. 3.20-1) / ZONE	NAME	COUNTY	PROJECT STATUS	TYPE	DESCRIPTION	CONSTRUCTION SCHEDULE	2-MILE CEA	5-MILE CEA	AQ OR SOCIO CEA
3 EP&K zone	Harquahala Solar Project	Maricopa	future	solar facility	Acreage and Land Ownership: approximately 3,514 acres of unknown land ownership Construction Schedule and/or Permitting Milestones: currently completely amended to change land use (Rural Development to Industrial); land is under contract.	unknown at this stage		X	X
5 EP&K zone	La Paz County land conveyance for solar develop-ment	La Paz	future	solar facility	Facility Owner/Developer: La Paz County, Arizona Acreage and Land Ownership: 5,935 acres of BLM-administered land General Overview: Sale of Federal land to La Paz County to provide enough land to pursue utility-scale solar energy production with private developers.	Bill H.R. 2630 introduced to House May 24, 2017; presented to the Senate January 9, 2019; no construction date set	X	X	X
6 EP&K zone	Fancher-Luxor Mine	Yuma	existing/ future	mine	Construction Schedule and/or Permitting Milestones: pending on funding General Overview: Gold mine with access via Hovatter Road, south of the Proposed Action route; a revised plan of operations is approved but the project is pending funding. (F. Bergwall, BLM, personal communication September 20, 2016; BLM 2016s).	pending funding			X

MAP ID # (FIG. 3.20-1) / ZONE	NAME	COUNTY	PROJECT STATUS	TYPE	DESCRIPTION	CONSTRUCTION SCHEDULE	2-MILE CEA	5-MILE CEA	AQ OR SOCIO CEA
8 QTZ zone	Plomosa 9 Placer Claim	La Paz	future	mine	General Overview: Potential project would be located on a 20-acre mining claim within La Paz County in the Plomosa Mountains just southeast of Quartzsite and in proximity to Alternative Segments. The claim is owned by Jackpot Minerals LLC and overseen by the BLM's YFO under the serial number AMC396777. Status is pending as they have an incomplete application. (F. Bergwall, BLM, personal communication September 20, 2016).	unknown at this stage	X	X	X
9 QTZ zone	Quartzsite Solar Energy Project	La Paz	future; pending on securing a PPA	solar facility	Facility Owner/Developer: Quartzsite Solar Energy, LLC Acreage and Land Ownership: 1,675 acres of BLM-administered land Technology Type: 100 MW concentrating solar power plant Construction Schedule and/or Permitting Milestones: pending on securing a PPA General Overview: 100 MW solar tower technology developed by Quartzsite Solar Energy on 1,675 acres of BLM-administered land located approximately 10 miles north of Quartzsite, near Arizona SR 95; currently focused on securing a PPA and lacking that makes it challenging to say exactly when they would commence construction (A. Wang, SolarReserve, personal communication August 25, 2016).	Construction start date is unknown and pending on securing a PPA. From BLM's perspective, construction would start at least 2 years after PPA. (E. Arreola, BLM, personal communication August 25, 2016).			X
10					Canceled				

MAP ID # (FIG. 3.20-1) / ZONE	NAME	COUNTY	PROJECT STATUS	TYPE	DESCRIPTION	CONSTRUCTION SCHEDULE	2-MILE CEA	5-MILE CEA	AQ OR SOCIO CEA
11 CB zone	West Port Gold Project	La Paz	future	mine	Facility Owner/Developer: ITEC Solutions Acreage and Land Ownership: 40 acres of BLM-administered land Technology Type: open pit mine Construction Schedule and/or Permitting Milestones: construction schedule is not publicly available, but could start at any time as environmental permits have been acquired General Overview: The project includes the development of a 500 ton per day aboveground, open pit operation that would produce between 5,000 and 10,000 ounces of gold per year for 10 to 15 years. The mine is located approximately 1 mile north of I-10 about 6 miles west of Quartzsite. (F. Bergwall, BLM, personal communication September 19, 2016).	Use and occupancy decision signed February 23, 2017	X	X	X
18 CR&CA zone	Blythe Energy Power Plant and Sonoran Energy Project (Licensed as Blythe Energy Project Phase II)	Riverside	future	power plant	Facility Owner/Developer: AltaGas Sonoran Energy Inc. Acreage and Land Ownership: 76 acres of BLM-administered land Technology Type: 569 MW combined cycle, natural gas-fired plant Construction Schedule and/or Permitting Milestones: 2nd or 3rd quarter of 2018 General Overview: the Blythe Energy Project Phase II is a 569-MW combined-cycle project that was certified by the Energy Commission in December 2005, but has not been built yet; the Blythe II facility will be located approximately 5 miles west of the	the current estimated start of construction date is June 14, 2018	X	X	X

MAP ID # (FIG. 3.20-1) / ZONE	NAME	COUNTY	PROJECT STATUS	TYPE	DESCRIPTION	CONSTRUCTION SCHEDULE	2-MILE CEA	5-MILE CEA	AQ OR SOCIO CEA
					city of Blythe on approximately 76 acres immediately adjacent to the operational Blythe Energy Project.				
19 CR&CA zone	Blythe Mesa Solar Project	Riverside	future	solar facility	Facility Owner/Developer: Renewable Resources Group Acreage and Land Ownership: 7,025 acres of BLM-administered land Technology Type: solar 485 MW photovoltaic facility General Overview: a proposed Renewable Resources Group 485 MW solar project on 3,587 acres near the Blythe airport. The project is located both north and south of I-10, spanning private agricultural land in both an unincorporated area of Riverside County, California, and a portion within the boundary of the city of Blythe, California; on August 18, 2015, the BLM issued a ROD approving issuance of a ROW grant in support of the Blythe Mesa Solar Project, owned by the Renewable Energy Group, Los Angeles, California.	unknown; construction has not yet started	X	X	X

MAP ID # (FIG. 3.20-1) / ZONE	NAME	COUNTY	PROJECT STATUS	TYPE	DESCRIPTION	CONSTRUCTION SCHEDULE	2-MILE CEA	5-MILE CEA	AQ OR SOCIO CEA
22 CR&CA zone	Desert Quartzite Solar	Riverside	future	solar facility	Facility Owner/Developer: First Solar Inc. - Desert Quartzite LLC Acreage and Land Ownership: 4,800 acres of unknown land ownership Technology Type: 300MW solar photovoltaic facility Construction Schedule and/or Permitting Milestones: construction expected once approvals and permits are obtained General Overview: a 300 MW solar photovoltaic project located on 4,900 acres south of I-10 and 8 miles southwest of Blythe proposed by Desert Quartzite LLC, a subsidiary of First Solar Inc; the project would interconnect at the Colorado River Substation.	construction expected once approvals and permits are obtained	X	X	X
24 CR&CA zone	Crimson Solar	Riverside	future	solar facility	Facility Owner/Developer: Recurrent Energy LLC - Sonoran West Holdings LLC Acreage and Land Ownership: 2,700 acres of BLM-administered land Technology Type: 350MW solar photovoltaic and energy storage facility General Overview: Proposal to construct and operate the RE Crimson Solar Project, a 350 MW solar photovoltaic and energy storage project that would be located on 2,700 acres of BLM administered land within the CDCA planning area; located in unincorporated eastern Riverside County, about 13 miles west of Blythe, just north of the Mule Mountains and south of I-10. Up to four	Notice of Intent (NOI) published March 9, 2018	X	X	X

MAP ID # (FIG. 3.20-1) / ZONE	NAME	COUNTY	PROJECT STATUS	TYPE	DESCRIPTION	CONSTRUCTION SCHEDULE	2-MILE CEA	5-MILE CEA	AQ OR SOCIO CEA
					substations that would transform voltage from the 34.5 kV electrical collection cables to 230 kV. The 350 MW of energy storage would be either flywheel or battery form.				
33 QTZ zone	Quartzsite Wastewater Treatment Plant Renovations	Yuma	future	Infra-structure	Facility Owner/Developer: Quartzsite Acreage: 16.7 acres General Overview: Expansion of existing wastewater treatment plant from 450,000 gpd to 900,000 gpd. Convert existing single sequencing batch reactor to two, add aeration and turbine blower building, new sludge drying beds, new headworks, and electrical efficiency upgrades	Unknown; in the planning, design, and funding stages	X	X	X

EP&K – East Plains and Kofa; QTZ – Quartzsite; CB – Copper Bottom; CR&CA – Colorado River and California

3.20.4 Cumulative Project Scenario by Resource

3.20.4.1 Air Quality and Climate Change

Geographic Scope

The CEA for the air quality and climate change effects is consistent with the 31-mile (50-km) radius used to analyze Project air impacts. A 31-mile radius was chosen to be consistent with minimum air quality analyses required by the EPA's Prevention of Significant Deterioration regulations. The cumulative air and climate change impact area represents a reasonable region in which existing air quality, when assessed in combination with other cumulative actions, would be impacted if the Project were implemented.

Cumulative Conditions

During Project activities, air pollutant emissions would temporarily be generated from earthmoving, vehicle/equipment exhaust, and vehicle travel on paved and unpaved surfaces.

Most of the Project air and climate change impacts would occur during construction; therefore, those projects that have ongoing air quality emissions or are under construction at the same time are the most relevant to assessing cumulative impacts. Existing projects listed in Table 3.20-5 that are permitted emitters should be included in the cumulative impacts analysis, such as the Harquahala Power plant, Plomosa Mine quarry, Ehrenberg Wash Pit, Blythe Energy Center, and operations at the YPG. Proposed projects listed in Table 3.20-6 to be considered include the Blythe Energy Power Plant/Sonoran Energy Project, the Plomosa 9 Placer Claim, the West Port Gold Project, and the Fancher-Luxor Mine. In addition, approximately 5 to 6 miles of the Proposed Action and Alternative Segments as well as the Delaney Substation are within the Phoenix ozone nonattainment area, which is classified as a moderate nonattainment area with respect to the 2008 ozone NAAQS. Nonattainment areas within the central Phoenix urban area are also present for CO and PM_{10}. The Mojave AQMD includes two nonattainment areas at the Federal level (Ozone and PM_{10}) and three at the state level (ozone, $PM_{2.5}$, and PM_{10}) (CARB 2017b). However, Federal designations are in San Bernardino County which do not fall within the 31-mile CEA. Additionally, the $PM_{2.5}$ California state nonattainment area is outside the CEA. Both the state designation of ozone and PM_{10} encompasses all of San Bernardino and Riverside Counties, of which the eastern portion of Riverside County is within the 31-mile CEA airshed.

In the context of GHG emissions, the potential effects are not local or regional, but rather global. Within this context, every GHG emitting project, however large or small, contributes cumulatively to the global GHG emissions total, and helps to increase global atmospheric concentrations of GHGs.

Global climate change is or has the potential to impact current energy infrastructure in a negative manner. For example, increased wildfires can directly damage transmission poles and electricity infrastructure. Another risk is derived from smoke and particulate matter, which can ionize the air creating an electrical pathway away from the transmission lines (Sathaye et al. 2013). Similarly, more frequent and intense heat waves decrease the efficiency of power plants during peak demand periods.

3.20.4.2 Geology, Minerals, and Soil Resources

Geographic Scope

The CEA for geology, soils, and minerals is the area that includes the Proposed Action, Alternative segments, and a 2-mile-wide buffer surrounding them. The CEA for Geology, Minerals, and Soil Resources encompasses 711,573 acres (Table 3.20-3a).

Cumulative Conditions

Potential impacts on geology and mineral resources could consist of mineral resource depletion, removal of mineral resources from availability for development, and topographic changes. Past and present activities such as road building, mineral extraction, and other infrastructure projects, have impacted the geology of the area due to terrain modifications and extraction of minerals (Tables 3.20-4a and 3.20-5). The past and present activities, such as road building, mineral extraction, and other infrastructure projects have impacted the geology of the area due to terrain modifications and extraction of minerals.

Numerous utility and energy development projects have occurred in the CEA, including the DPV1 transmission line, WAPA transmission line, El Paso natural gas pipeline system, and numerous solar facilities and gas power plants. The BLM LR2000 database indicates that there are numerous mining claims in the CEA. Known active existing mines and planned projects in the general vicinity of the Project include the following:

- Plomosa 9 Placer Claim – Potential project would be located on a 20-acre mining claim within La Paz County in the Plomosa Mountains just southeast of Quartzsite and adjacent to Alternative Segment x-05. The claim is owned by Jackpot Minerals LLC and overseen by the BLM's YFO under the serial number AMC396777. (Refer to Appendix 1, Figure 3.20-1, site #8.)
- West Port Gold Project – This project, operational in 2017, includes the development of a 500-ton per day, aboveground, open pit operation that would produce between 5,000 and 10,000 ounces of gold per year for 10 to 15 years. The mine would be located approximately 1 mile north of I-10 and about 6 miles west of Quartzsite, just north of Alternative Segment i-06. The project owner is ITEC Solutions Inc. (Refer to Appendix 1, Figure 3.20-1, site #11) (ITEC Solutions 2016)
- Ehrenberg Wash Pit – The operation consists of mining or quarrying crushed and broken stone on BLM-administered lands. The operation is expanding the 40-acre open pit by an additional 20 acres.
- Plomosa Mine Quarry – Quartz-based decorative rock is mined, crushed, screened, stockpiled, and hauled out at this active operation located southeast of Quartzsite. This claim includes 180-acres of BLM-administered land. A 20-acre expansion was proposed in 2015 and a FONSI was signed in February of 2016.

In addition to the active and planned mining projects noted, construction of roads, utilities, and other types of development could modify surface topography, thus altering drainage and erosion.

The primary source of impacts to soils is surface disturbance which is directly tied to land use. Disturbed soil loses its structure and porosity when disturbed through displacement or compaction by heavy equipment. Consequently, the soil is more prone to erosion by water or wind and may be less able to support some kinds of vegetation (loss of productivity).The types of past and present disturbances that have affected soils in the CEA include , utility corridors, road construction, , energy development, mineral extraction, livestock grazing, agricultural activities and recreational use. These activities and other types of developments could modify surface topography, thus altering drainage and erosion.

3.20.4.3 Paleontological Resources

Geographic Scope

The CEA for paleontology is the area that includes the Proposed Action route, Alternative segments, and a 2-mile-wide buffer surrounding them (711,573 acres; Appendix 1, Figure 3.20-1).

Cumulative Conditions

The CEA has yielded paleontological resources that have contributed to the understanding of the development and history of life on earth. Paleontological resources are subject to cumulative impacts via loss through both natural processes of erosion and weathering, and man-made disturbances. Natural processes such as soil erosion and rock weathering can expose fossils. Cumulative effects to paleontological resources occur through the incremental degradation of the resources from various impacts, which reduce the information and scientific research potential of the resources.

The current land ownership and land uses, thus disturbances, within the CEA are presented in Tables 3.20-3a and 3.20-4a. There are active and planned mining operations in the CEA, such as those discussed in Section 3.20.4.2, which include ground-disturbing activities related to exploration, development, and extraction that could encounter paleontological resources. In addition, roads, transmission lines, pipelines, solar energy development, and residential development (Tables 3.20-4a, 3.20-5, and 3.20-6) can impact near surface deposits of paleontological resources in general and possibly deeper deposits in areas that require excavation.

3.20.4.4 Biological Resources

Geographic Scope

The CEA for biological resources, including vegetation and wildlife resources, is the general CEA which includes the Proposed and Alternative segments and a 2-mile-wide buffer (711,573 acres).

Lower Sonoran Desert

- Approximately 43 percent of the Lower Sonoran region is in Federal ownership, 23 percent is private, 10 percent is state trust lands, and 24 percent is tribal land.

Upper Sonoran Desert

- Approximately 47 percent of the Upper Sonoran region is in Federal ownership, 12 percent is private, 17 percent is state trust lands, and 24 percent is tribal land.

Cumulative Conditions

Past and present land uses have altered the extent, structure, and composition of native vegetation communities in the CEA. Vegetation communities adjacent and near existing highway corridors have largely been degraded by long-term impacts associated with easy access off the highways for recreation; commercial, residential, and agricultural development adjacent to I-10, including the presence of roads, canals, and various utility lines; and the LTVA along US 95. Evidence of OHV use is present throughout, resulting in damage to and loss of vegetation. Highway corridors function as dispersal routes for non-native invasive plants. Commercial and residential developments and associated infrastructure, as well as agricultural development, results in clearing native vegetation; grazing by livestock can contribute to increased competition with native species for forage, facilitating the spread of noxious and non-native invasive weeds, changing the structure and composition of native plant communities, and degrading water quality. Undeveloped lands generally retain their native vegetation communities, with noxious and invasive weed species often taking root, especially in areas near roads and other disturbances.

Past and present actions in the CEA (Tables 3.20-4a and 3.20-5) have resulted in negative impacts to wildlife at various levels. The primary impact to wildlife resources within the CEA include habitat loss and fragmentation, and displacement of wildlife as a result of human presence and habitat changes associated with past and present community development, roads, grazing, agricultural development, utility development (electric, water, gas, etc.), recreation, and mining. High traffic volume on interstate highways has fragmented habitat and impeded wildlife movement across the landscape; facilitated human access to adjacent areas resulting in disturbance to wildlife and damage to habitats, especially by off road vehicles; and caused repeated loss of individual animals to road mortality over the long-term, resulting in reduced population numbers. Smaller less mobile wildlife species are susceptible to crushing and mortality by vehicle traffic and other development activities.

The AGFD (2012) has summarized existing conditions and stressors that are important for the conservation of biodiversity in the Sonoran Desert region. The following summary is from that document and is generally applicable in most of western Arizona and eastern Riverside County in California.

Lower Sonoran Desert

- More than 21 percent of lower Sonoran desertscrub has been replaced by development or agriculture; this region is being further reduced by urban expansion and energy development.
- Much of the area has been degraded by livestock grazing.

Upper Sonoran Desert

- About 8 percent of this region has been replaced by development or agriculture.
- Invasion of nonnative plants and a resulting increase in the risk of wildfire in areas where fire was not a natural occurrence is an important threat to this region.

Potential impacts or threats to vegetation in the CEA and surrounding region include the following:

- Altered surface hydrology
- OHVs (especially in xeroriparian washes)

- Disease
- Invasive plant and animal species
- Fire
- Power lines
- Climate change
- Drought
- Canals and pipelines
- Military activities

Reasonably foreseeable future actions (Table 3.20-6) in the CEA include: additional transmission lines, roads, and other linear disturbances (e.g., transmission lines); large-scale energy development (i.e., solar facilities and a power plant); mine development; and additional OHV use and other dispersed and concentrated recreational activities. With the presence of the Project and added transmission capacity, the CEA may be more attractive to new utility scale energy development than without the Project.

The Project could contribute to the cumulative effects in the following ways:

- Habitat Loss – Some route segments, such as those close to I-10, are in areas with substantial existing disturbances; other route segments, such as in the Copper Bottom Pass and Johnson Canyon vicinity, are in largely pristine desert habitat.
- Habitat Fragmentation – This could be especially important on the Palo Verde Mesa near the Colorado River Substation where there are numerous recent and planned transmission lines and energy development projects; and crossing the Kofa NWR compounding the habitat fragmentation caused by DPV1.
- OHVs – Presence of a new access road, or improvement of existing roads, could increase access to otherwise remote habitats. There currently is substantial OHV activity around Quartzsite.
- Increased Risk of Bird Mortalities during Operations – This cumulative impact would be highest along the existing DPV1, including at the crossing of the Colorado River, and near the Delaney and Colorado River Substations, and in association with guyed V structures.

3.20.4.5 Cultural Resources

Geographic Scope

The CEA for the analysis of cultural resources is the Proposed Action route, Alternative segments, and a 5-mile-wide buffer (1,175,644 acres). This is the area in which direct and indirect impacts to cultural and historic resources could occur through physical disturbance, encroachment, or visual impacts. A 5-mile buffer should encompass the extent of the visual analysis and the vantage points from which the Proposed Action and Alternative segments, and other past, present, and reasonably foreseeable disturbances can be discerned. Although the CEA for cultural resources was generally within 0.5-mile of the Proposed Action and Alternative segments, aerial photos for traditional and cultural properties within 5 miles of the segments were reviewed to take into account cultural, historic, and visual impacts.

Cumulative Conditions

Land ownership is detailed in Table 3.20-3b above. Approximately 655,709 acres (55.8 percent) of the CEA are managed by the BLM, 13,110 acres (1.1 percent) by Reclamation, 39,867 acres

(3.4 percent) are military lands, and an additional 116,009 acres (9.9 percent) by the USFWS. This equates to 70.2 percent of the CEA under Federal regulatory oversight, subject to Section 106 of NHPA. An additional 84,350 acres (7.2 percent) are Arizona state lands and 924 acres (less than 0.1 percent) are California state lands, subject to state regulatory oversight.

Past and present disturbances to cultural resources in the CEA have been the result of utility installation, road development, ranching/agriculture, residential and commercial development, archaeological excavation, recreational activities, and likely vandalism and unauthorized artifact collection. The past and present land uses in the CEA have resulted in the loss, disturbance, theft, and burial of cultural artifacts and sites, as well as the modification and alteration of the setting of cultural sites and resources. The incremental degradation of cultural resources reduces the information and interpretive potential of historic properties. Development on state and Federal lands requires that cultural resource surveys be conducted to determine the presence of cultural resource sites eligible for listing on the National Register. As directed by Section 106 of the NHPA, National Register-eligible sites are generally avoided or mitigated if avoidance is not possible for projects with a Federal or state nexus. Projects/development disturbances conducted prior to 1966 (i.e., prior to NHPA) and/or those without a Federal or state nexus generally did not identify/quantify cultural resource sites or impacts to them.

Sites that have been determined to be ineligible for the National Register did not require avoidance, have been discharged from management, and therefore have likely been impacted by the activities requiring the cultural resource inventory (i.e., development, utility installation, fence projects, road construction, etc.).

Impacts to cultural and historic resources would occur during construction if NRHP-eligible resources are disturbed or destroyed as a result of excavation and/or removal. Further ongoing impacts could occur as a result of visual impacts. Increased access to remote areas as a result of Project construction could result in increased vandalism of cultural resources.

Current and future development would contribute to cumulative cultural resources effects in the region.

3.20.4.6 Concerns of Indian Tribes

Geographic Scope

The CEA for the analysis of Concerns of Indian Tribes includes the Proposed Action and Alternative segments and a 5-mile-wide buffer surrounding them (1,175,644 acres). This is based on the scale of the Project and the vantage points from which the Proposed Action and Alternative segments, and other past, present, and reasonably foreseeable disturbances can be discerned from potential areas of importance to the tribes.

Cumulative Conditions

Various tribes have been consulted and informed of the Project. Tribes have expressed interest and concern about potential effects to the native landscape, the viewshed, trails and elements of Native infrastructure across the desert, cultural resource sites, and TCPs that are within their traditional territories and may have been inhabited or used by their ancestors. Noted concerns include the many transmission lines within the viewshed. Past actions affecting Concerns of Indian Tribes include vandalism and looting of prehistoric sites, unauthorized excavation of prehistoric sites, recreational use, roadway and infrastructure construction, and urban and rural developments. Current and future development (Tables 3.20-5 and 3.20-6; Appendix 1, Figure 3.20-1) would contribute to cumulative impacts to Concerns of Indian Tribes in the region.

3.20.4.7 Land Use

Geographic Scope

The CEA for land use is the Proposed and Alternative segments and a 2-mile-wide buffer surrounding them, encompassing 711,573 acres.

Cumulative Conditions

Tables 3.20-3a and 3.20-4a present land ownership and land uses in the CEA from which land management and disturbances can be inferred. Of the 711,573 acres in the CEA (Table 3.20-3a), 395,687 acres (55.6 percent) are BLM-administered land, 12,828 acres (1.8 percent) are Reclamation, 68,583 acres (9.6 percent) are USFWS, and 14,618 acres (2.1 percent) are military lands; therefore, 491,717 acres or 69.1 percent of the CEA is under Federal management. The dominant developed land uses (Table 3.20-4a) in the CEA consist of 73,808 acres of residential lands (10.4 percent of CEA) and 43,977 acres of agricultural land (6.2 percent of CEA). Transmission lines and solar facility development total 13,287 acres (1.9 percent of the CEA).

Past and present developments and disturbances related to land use were presented in Section 3.8. In general, the CEA is characterized by open, desert lands used for grazing, mining, utilities, recreation, and dispersed residential development. In some areas, open desert has been converted to residential, commercial, and industrial uses (e.g., YPG, power plants, electrical substations, mines). Reclamation managed lands include the CAP canal (which itself is managed by the Central Arizona Water Conservation District).

Reasonably foreseeable future development in the region includes additional transmission lines, gas pipelines, roads, and other linear disturbances; large-scale energy development, especially in California; and additional OHV use and other dispersed and concentrated recreational activities. Placement of transmission line alternatives near towns and cities could reduce the number of options for compatible uses on nearby lands. The cumulative analysis will evaluate the Project's contribution to cumulative visual, recreational, residential, and agricultural impacts which could affect local land uses important to local economies.

3.20.4.8 Grazing and Rangeland

Geographic Scope

The CEA for grazing and rangeland is the Proposed and Alternative segments and a 2-mile-wide buffer (711,573 acres).

Cumulative Conditions

Cumulative effects to grazing in the CEA occur primarily from energy development (i.e., solar facilities, transmission lines), municipal/residential development, and mining. Recreation can also affect grazing but to a negligible extent compared to ground disturbing activities. In general, grazing is not allowed on solar facilities, active mine areas, or other developments. After reclamation of ground disturbance, renewed grazing may not be allowed on a reclaimed site for several years.

Reasonably foreseeable future development in the region that could cumulatively impact grazing and rangeland includes additional transmission lines, roads, and other linear disturbances; large-scale energy development; and additional OHV use. The cumulative analysis will evaluate the Project's contribution to cumulative loss of rangeland and grazing opportunities.

3.20.4.9 Recreation, Special Designations, Management Allocations, and Wilderness Resources

Geographic Scope

The CEA for the analysis of recreation, special designations, management allocations, and wilderness resources is the general CEA that includes the Proposed and Alternative segments and a 2-mile-wide buffer (711,573 acres).

Cumulative Conditions

Lands with special designations and wilderness resources provide opportunities for solitude and primitive, unconfined recreation and protect natural or undeveloped landscapes and resources. Lands within the CEA provide opportunities for dispersed and developed recreation. Dispersed recreation includes camping, hunting, wildlife observation, photography, backpacking, horseback riding, hiking, and backcountry driving. Developed recreation includes parks and OHV trails. Portions of the proposed Arizona Peace Trail are located within the CEA.

Residential and commercial developments have led to surface disturbances and converted native vegetation communities to urban landscaping. Population growth has increased traffic and pressure in recreational areas. The mixture of land use development in the CEA has altered the land, its character, and the viewshed.

Reasonably foreseeable projects in the CEA include roads and other linear disturbances; large-scale energy development, especially in California; and OHV use and other dispersed and concentrated recreational activities.

3.20.4.10 Noise

Geographic Scope

The CEA for noise is the general CEA that includes the Proposed and Alternative segments and a 2-mile-wide buffer surrounding them. The CEA for potential cumulative impacts to noise represents a reasonable region in which noise, when assessed in combination with other cumulative actions, would be impacted if the Project were implemented.

Cumulative Conditions

The current land ownership (Table 3.20-3a) and uses within the CEA (Table 3.20-4a) indicate dominant and/or likely noise sources. The ambient sound environment within the CEA would generally be expected to vary with proximity to the major transportation routes and developed areas. Current ambient noise conditions represent the cumulative effect of noise generation on a local geographic scale. Except for the I-10 vicinity and in Blythe, existing noise levels in the CEA are generally low.

Air traffic impacts are generally restricted to near the vicinity of the few small airports and/or private air strips in or adjacent to the CEA. Takeoffs and landings generate brief but loud local impacts. Military aircraft utilize a portion of the CEA when flying to/from the YPG. Commercial and industrial activities in the CEA can produce localized noise but these are few in number. The most prominent noise impacts in the CEA result from transportation sources and ranch, residential, or small development sounds generated in areas of higher population density, such as Blythe.

3.20.4.11 Hazards and Hazardous Materials

Geographic Scope

The CEA for the analysis of hazardous materials and hazardous waste is the Proposed and Alternative segments and a 2-mile-wide buffer (711,573 acres).

Cumulative Conditions

Past and present activities in the area that generate hazardous materials and/or hazardous and waste include mining, residential and commercial development, roads, energy generation activities in general, utilities, and military installations.

There are several landfill and waste facilities in proximity to the Project including the La Paz County landfill, Lone Cactus landfill, Sickles Sanitation landfill, and Northwest Regional landfill in Maricopa County, among others, and the Corona landfill in Riverside County.

Use of hazardous materials could result in releases to the environment. In addition, the presence of hazardous waste in soil disturbed during construction and operations and maintenance activities could result in exposure of workers to hazardous materials or waste.

3.20.4.12 Public Health and Safety

Geographic Scope

The CEA for public health and safety is the general CEA that includes the Proposed and Alternative segments and a 2-mile-wide buffer surrounding them. The CEA for potential cumulative impacts to public health and safety represents a reasonable region in which occupational health and safety risks, severe weather and fire risks, and potential exposure to EMF, when assessed in combination with other cumulative actions, would be impacted if the Project were implemented.

Cumulative Conditions

Existing and reasonably foreseeable future actions have the potential to result in cumulative impacts to human health and safety by increasing the potential for occupational health and safety risks, fire risks, and generating EMF. There are several existing sources of EMFs in the CEA including the numerous substations and various portions of 69kV, 230kV, and 500kV transmission lines. These projects include the existing DPV1, existing pipelines, existing and planned utility scale solar projects, substation construction and expansions, and the future expansion of the communities and roadways within the CEA. Past and present projects and disturbances have increased the cumulative level of human influence adjacent to wildlands and the number of human-caused wildfire ignitions.

3.20.4.13 Socioeconomics and Environmental Justice

Geographic Scope

The CEA for socioeconomics and EJ is Maricopa and La Paz Counties in Arizona and Riverside County, California. This is the geographic extent of the cumulative impact analysis because socioeconomic factors such as public services and utilities are provided by local jurisdictions or districts, and the local labor force is expected to come primarily from within these counties. In addition, public services and utilities plans and population and housing demand projections are prepared at the county level. The Environmental Justice CEA includes the three-county area and the Block Groups used for evaluating impacts for this topic area.

Cumulative Conditions

The range of potential cumulative impacts that should be considered in the cumulative socioeconomics and EJ analysis includes effects on local economies and local labor force demand. Future foreseeable projects such as planned solar energy projects and associated utilities in combination with the Project may require construction workers from within the same local labor force if they are constructed concurrently with the Project. The development of these projects in combination with the construction of the Project could result in an impact to the local housing market if construction workers were to relocate into the area.

Past development and population growth within the CEA have impacted employment, public services, utilities, and housing demands. Population increases have increased development in Riverside County and Maricopa County (mainly in incorporated areas), expanded the demand for housing, and increased the available workforce. Additional development both increases pressure on existing public services and utility systems and provides additional infrastructure to increase capacity and change employment opportunities.

The Project in conjunction with reasonably foreseeable energy, utility, and other infrastructure projects could support population increases in the area for the foreseeable future. The CEA has a rural character and local communities rely on that character to draw visitors that support their local economy.

As expressed by the CRIT, they have a deep connection to the landscape, natural and cultural resources, and wildlife. Continued development could result in impacts to the cultural landscape and linkage.

3.20.4.14 Traffic and Transportation

Geographic Scope

The CEA for traffic and transportation is the general CEA that includes the Proposed and Alternative segments and a 5-mile-wide buffer surrounding them. Transportation into the general area would primarily be on existing and established access routes.

Cumulative Conditions

The existing transportation system in the CEA includes I-10 and US 95, as well as local arterial and collector roads, and airports. I-10 serves as a major east-to-west transportation corridor (about 31,000 vehicles travel on I-10 between Tonopah, Arizona, and Blythe, California on a typical weekday). The peak traffic on US 95 within the CEA occurs between January and March. Higher volumes of traffic are experienced on US 95 near Quartzsite in the winter months, when recreational use of the area is highest. A number of Proposed segments and Alternative Segments in California would be near public or private airports. Alternative Segment ca-05 is the segment closest to the Cyr Aviation Airport. No active railroad lines exist near the Proposed Action route or Alternative Segments. Both the Arizona Statewide Rail Plan and the California State Rail Plan were reviewed. Both plans recognize the possibility of I-10 serving as a future high-speed passenger rail corridor linking the Los Angeles-Orange County-San Bernardino and greater Phoenix metropolitan regions, although no timeline is given for this project, therefore it is not considered reasonably foreseeable.

A review of current state, county, and municipal land use plans, zoning ordinances, and public policies indicate that undisturbed and uninhabited desert will continue to be the future condition in most of the CEA, and large increases in traffic volumes are not anticipated in the near future. Reasonably foreseeable future projects and activities within the area include access roads required for transmission lines, gas pipelines, and large-scale energy development, especially in California, and additional OHV use and other dispersed and concentrated recreational activities.

Those impacts from other projects that have the potential to combine cumulatively with impacts from the Project would be in the use of roads for delivery of labor and materials. In undeveloped areas traffic volumes are low in general; however, winter visitors to the Quartzsite area would have to be taken into account in the evaluation of cumulative impacts for the Project.

3.20.4.15 Visual Resources

Geographic Scope

The CEA for the analysis of visual resources includes the Proposed and Alternative segments and a 5-mile-wide buffer surrounding them. This is based on the scale of the Project and the diminution of the apparent size of objects at greater distances. In general, taller structures can be viewed from greater distances.

Cumulative Conditions

Cumulative effects to visual resources occur where built facilities or activities occupy the same field of view as other built facilities or impacted landscapes, and an adverse change in the visible landscape character is perceived. These are often categorized as local viewshed effects. A cumulative effect could also occur if a viewer perceives that the general visual quality or landscape character of a localized or regional area (I-10 corridor) is diminished by the proliferation of visible similar structures or construction effects, even if the changes are not within the same field of view as existing (or future) structures or facilities. The result is a perceived “industrialization” or “urbanization” of the existing rural or undeveloped landscape character. These are often categorized as regional viewshed effects.

The types of past and present disturbances that have affected visual resources in the CEA include large scale energy development, transmission lines and other utility corridors, road construction, agricultural activities, residential development, and mining activity (Table 3.20-4b). Specific projects and disturbances that have affected visual resources are described in Table 3.20-5. Specifically, within the Colorado River and California zone, there are 7 existing solar facilities, along with their associated gen-tie lines; 6 transmission lines, and one combined cycle power plant that visually contribute to a sense of industrialization, particularly in the vicinity of the Colorado River Substation.

Reasonably foreseeable future disturbances that may affect visual resources in the CEA include additional large-scale solar facilities, a power plant, and mining activity (Table 3.20-6). Specifically, within the Colorado River and California zone, an additional three solar facilities, along with their associated gen-tie lines are proposed; and an additional combined cycle power plant.

3.20.4.16 Water Resources

Geographic Scope

The CEA for the analysis of water resources is any surface waters or groundwater aquifers crossed by or contained within the general CEA, which includes the Proposed and Alternative segments and a 2-mile-wide buffer (711,573 acres). The entire general effects area is within the Colorado River Basin and the Basin and Range basin-fill aquifers.

Cumulative Conditions

Various land conversions, including residential/community development, roads, agriculture, and mines, as well as wildfires and grazing, have impacted surface water resources and wetlands in the CEA.

One Section 303(d) impaired waterbody, the Colorado River, occurs in the CEA. As noted in Section 3.19.3.1, the portion of the river from Lake Havasu Dam to Imperial Dam was revised to add toxicity as a pollutant from unknown sources impairing the Colorado River. The proposed TMDL is planned to be completed by year 2025 (CDWR 2014).

FEMA floodplain mapping is available for approximately 14.6 percent of the CEA (103,940 acres); the remaining areas are unmapped and their flood hazard undetermined. The areas not mapped as 100-year floodplain are designated as moderate- or low-risk areas for flooding or are not considered at risk for flooding in any circumstances. Levees, dikes, and upstream dams control floods in developed areas of the Project and along the Colorado River Valley. Undeveloped desert environments, however, are subject to seasonal flooding or ponding over extensive areas. Flooding in the CEA occurs primarily from overflows of drainage channels when flows exceed the capacity of the channels. Flood hazards in the CEA are attributable to the flows of the Colorado River, potential dam failure along the river, and floods along the larger ephemeral tributaries of the Colorado River. Developments encroaching on floodplains can affect the distribution and timing of drainage, thereby increasing floods. Development in floodplains can create or exacerbate local flooding by altering or confining drainage channels.

The vegetated corridors adjacent to waterbodies are riparian areas. In Arizona and California, these areas are particularly important, as they can exist within desert areas and host a variety of wildlife that depend on the vegetation and water for foraging and roosting. The type of vegetation within riparian areas changes based on soil type, temperature, elevation, and seasonal water fluctuations (AGFD 2016d). These areas are some of the most productive ecosystems in the US due to their diversity and proximity to water, which is often a limiting resource for wildlife. In Arizona, 70 percent of the state's threatened and endangered species rely on riparian zones for survival (Arizona Cooperative Extension 2016). Within the CEA, riparian areas are located adjacent to the Colorado River on the Arizona/California border, just east of Blythe, California. No other riparian areas are present in the CEA (HabiMap Arizona 2016). Within the CEA near the Colorado River, the riparian areas are limited in width compared to other areas along the Colorado River where less development occurs.

Reasonably foreseeable future actions in the region include additional transmission lines, roads, and other linear disturbances; large-scale energy development, especially in California; mining; and additional OHV use and other dispersed and concentrated recreational activities.

The Project could contribute to the water resources cumulative effects in the following ways:

- Degradation of flood-prone areas: While only small, incremental impacts associated with developing portions of the Project within flood prone areas are expected, the impacts could add to the cumulative increase of development in flood hazard areas that may result in map revisions to flood elevations.
- Loss of wetland area and function: While the historical losses of wetlands and their associated functions along the Colorado River corridor are well documented, the collective impacts from new projects within wetlands could result in cumulative impacts to riparian functions, habitat for sensitive species, and the introduction of invasive species into wetland environments.
- Impacts to non-wetland WOUS: Increased erosion and potential sedimentation in floodplains and waterways.
- Navigation of a TNW: The installation of a new transmission line over the Colorado River, depending on the overhead clearance could result in additional impacts to the navigability of a TNW.

Technical Environmental Study
Chapter 4

Ten West Link
500kV Transmission Line Project

Prepared for:

US Department of the Interior

Bureau of Land Management

Yuma Field Office

Prepared By:

Stantec Consulting Services Inc.

2890 East Cottonwood Parkway, Suite 300

Salt Lake City, Utah 84121

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4.0 IMPACT ANALYSIS

4.1 INTRODUCTION

This chapter presents the environmental impact analysis for the various resources introduced in Chapter 3 of this Technical Environmental Study.

This chapter includes the following:

Section 4.1 provides an introduction to the chapter and the definitions for terms used to describe environmental effects.

Sections 4.2 through 4.19 discuss the environmental consequences for each resource, including direct, indirect, and cumulative effects. Residual and unavoidable adverse effects, MMs, irreversible and irretrievable effects, and relationship of short-term use versus long-term productivity of resources are also presented.

4.1.1 Impact Assessment

The Proposed Action and Action Alternatives may cause, directly or indirectly, changes in the human environment. This Technical Environmental Study assesses and analyzes these potential changes and discloses the effects.

The No Action Alternative forms the baseline against which the potential impacts of the Proposed Action and Action Alternatives on the human environment are compared. Under all alternatives, including the No Action Alternative, changes to the current baseline of the human environment by ongoing natural and anthropogenic processes would occur.

Many concepts and terms used when discussing impacts assessment may not be familiar to the average reader. The following sections clarify some of these concepts.

4.1.1.1 Significance

The word "significant" has a very particular meaning when used in a NEPA document.

Significance is defined by CEQ as a measure of the *intensity* and *context* (40 CFR 1508.27) of the effects of a major Federal action on, or the importance of that action to, the human environment. Significance is a function of the beneficial and adverse effects of an action on the environment.

Intensity refers to the severity or level of magnitude of impact. Public health and safety, proximity to sensitive areas, level of controversy, unique risks, or potentially precedent-setting effects are all factors to be considered in determining intensity of effect. This Technical Environmental Study will primarily use the terms major, moderate, minor, or negligible in describing the intensity of effects.

Context means that the effect(s) of an action must be analyzed within a framework, or within physical or conceptual limits. Resource disciplines; location, type, or size of area affected (e.g., local, regional, national); and affected interests are all elements of context that ultimately determine significance. Both long- and short-term effects are relevant.

Use of the term “significant” when referring to effects indicates some threshold for a particular impact indicator is exceeded.

4.1.1.2 Effects/Impacts

The terms “effect” and “impact” are synonymous under NEPA. For example, effects may refer to ecological, aesthetic, historical, cultural, economic, social, or health-related phenomena that may be caused by the Proposed Action or Action Alternatives. Effects may be direct, indirect, or cumulative in nature. Cumulative effects are analyzed at the end of this chapter.

Effects may be direct, indirect, or cumulative in nature. A direct effect occurs at the same time and place as the action. Indirect effects are reasonably foreseeable effects that occur later in time or are removed in distance from the action. Direct and indirect effects are discussed in combination under each affected resource.

Effects to a resource are cumulative when the effects from the Project are added to the effects (anticipated effects) from other past, present, or reasonably foreseeable future projects in the CEA for the Project. The CEA may be larger than the direct effects area. Cumulative effects are analyzed under each resource section.

4.1.1.3 Avoidance, Minimization, and Mitigation of Impacts

The impact analysis in this Technical Environmental Study assumes avoidance of impacts to sensitive resources where possible and implementation of all APMs as part of the applicant’s Project description. Where other impacts are identified that are not addressed by these APMs or BMPs or where the APMs are not considered adequate to reduce impacts, additional MMs are identified and analyzed as being implemented. The MMs presented in this Technical Environmental Study are identified in the mitigation monitoring, compliance, and reporting tables at the end of each individual area of environmental analysis. If residual effects remain after the mitigation is applied, those effects are described as well. Mitigation measures are means to address environmental impacts that are applied in the impact analysis to reduce intensity or eliminate the impacts. To be adequate and effective, CEQ rules (40 CFR 1508.20) require that MMs fit into one of five categories:

(a) Avoiding the impact altogether by not taking a certain action or parts of an action;

(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation;

(c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;

(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or

(e) Compensating for the impact by replacing or providing substitute resources or environments.

Any compensatory mitigation identified in the EIS is either a requirement of the existing land use plan (CDCA Plan, as amended) or in order to comply with state or Federal law.

For cultural resources and concerns of Indian tribes, mitigation would be part of the suite of approaches used to address or resolve adverse effects in accordance with the provisions of the PA (Appendix 2D). Avoidance of cultural resource sites followed by minimizing impacts is the preferred method to address potential impacts to cultural resources and Indian concerns, followed by other types of mitigation or data recovery.

4.1.1.4 Impact Indicators

An impact indicator is an element or parameter used to determine change (and the intensity of change) in a resource. Impact indicators are the consistent currency used to determine change (and the intensity of change) in a resource. Working from an established existing condition (i.e., baseline conditions described in Chapter 3) this indicator would be used to predict or detect change in a resource related to causal effects of proposed actions.

4.1.2 Environmental Effect Categories

The following environmental effect categories (Table 4.1-1) are presented to define relative levels of effect intensity and context and to provide a common language when describing effects. The definitions in the table below are general. Duration of Project disturbance has been described in Chapter 2 in terms of temporary (during construction) and permanent (life of Project, projected to be about 50 years). However, for purposes of impact analysis, duration of impacts do not necessarily correlate directly. General duration of effects is defined here; however, specific durations appropriate to individual resources are defined in the following resource sections where it differs from Table 4.1-1.

Table 4.1-1 Summary of Terms Used to Describe Environmental Effects

ATTRIBUTE OF EFFECT		DESCRIPTION
	No impact	There would be no change to the current condition of resource as a result of Project construction, operation, maintenance, or decommissioning.
	Negligible	No measurable change in current conditions.
Magnitude (Intensity)	Minor	A small, but measurable change in current conditions.
	Moderate	An easily discernible and measurable change in current conditions.
	Major	A large, easily measurable change in current conditions.
Duration	Short-term	During construction (1.5 – 2 years), up to 10 years.
	Long-term	More than 10 years.

Note: Descriptions are typical, but may vary by resource.

4.1.3 APMs, BMPs, and CMAs

APMs and BMPs have been identified for the Project (Section 2.2.10) and are described in Appendix 2A. The CDCA Plan of 1980 as amended (Section 3.8.1) contains CMAs, which include a specific set of avoidance, minimization, and compensation measures. The applicability of those measures to the Project was determined using a CMA checklist (Appendix 2C). Those CMA measures that were determined to be applicable to the Project are included in the Project

APMs/BMPs (Appendix 2A) and are cross-referenced to the CMA checklist in Appendix 2C. Certain APM/BMPs may be called out specifically in the resource sections, however, for a complete list of applicable APM/BMPs see Appendix 2A.

4.1.4 Proposed RMP Amendment

Under the Proposed Action and Action Alternatives, amendments to the Yuma, Lake Havasu and/or CDCA Plan would be required, as the project would not be in conformance with the current land use plans (outlined in Sections 2.2.2.2 and 2.5).

Amending any of these plans would not actually involve any ground disturbing activities, but would allow for ground disturbing activities to occur. Impacts from amending the plan(s) could affect mineral resources, land use, socioeconomics, and other resources. Changing the VRM classification would affect the future management of visual resources. These impacts are discussed under the corresponding sections below. Because amending the plan(s) would not immediately involve ground disturbance or development, this action would not directly or indirectly impact the remaining resources. Direct or indirect impacts that arguably could be associated with amending a plan to establish a utility ROW outside a designated utility corridor would be the same impacts as those disclosed in relation to the Project's construction, operation, maintenance, and decommissioning activities.

4.1.5 Organization of Analysis

For purposes of analysis to compare impacts between full route alternatives and subalternatives, several methods were used. First, impacts common to all segments are disclosed. Then impacts are analyzed by zone. Due to the length of the Project and the diversity of resources, four zones were identified (Sections 2.4.6 and 2.4.7). Impacts common in the zone are presented and specific impacts by segment are called out as appropriate. Then each full route alternative is analyzed with differences in impacts, if any, by subalternative following full route discussions.

Chapter 4 includes a discussion of direct and indirect effects specific to Project segments to identify distinguishing characteristics associated with specific segments in each zone. If a specific segment is not identified, it should be assumed that the general impacts described in Direct and Indirect Effects Common to All Action Alternatives for each resource would occur.

4.2 AIR QUALITY AND CLIMATE CHANGE

4.2.1 Introduction

Impacts to air quality would be associated with the construction, operation, maintenance, and decommissioning of the Project. Impacts to air quality are discussed in terms of Project emissions of criteria air pollutants and GHGs on a full route alternative basis. In addition to quantifying the Project emissions on a mass basis, a general screening-level impact analysis has been conducted to predict ambient concentrations of air pollutants for Project-related activities that have the greatest potential to exceed applicable ambient air quality standards.

For the purposes of the analysis, emission estimate summaries for each of the full route alternatives under consideration have been compared with general conformity threshold levels, while predicted ambient air concentrations have been compared with the Significant Impact Levels (SILs). The state of Arizona Modeling Guidance provides both permitting exemption thresholds and SILs (ADEQ 2015b). As illustrated in subsequent sections, a SIL comparison is conducted if exemption thresholds are exceeded. Where predicted exceedances to an SIL exist, the predicted ambient concentration plus the representative background concentration have been compared with the applicable national or state ambient air quality standards.

All Action Alternatives would result in emissions of criteria pollutants, hazardous air pollutants (HAPs), and GHGs. Only the No Action Alternative would result in no Project-related emissions or impacts.

Operational emissions and impacts would be much lower than construction phase emissions; therefore, impacts have not been quantified (with the exception of SF_6 from the circuit breakers). The total amount of truck travel (off-road equipment) and disturbed area that primarily contributes to the development of air emissions would be non-existent or very limited during operations. Operation and maintenance emissions would include vehicle exhaust from travel to substations and the transmission line for routine inspection, as well as SF_6 emissions from operation of the gas-insulated circuit breakers in the switchyards.

- Fugitive dust from earth-moving associated with construction activities in support of the upgrade and new build of the transmission lines and substations;
- Fugitive dust from vehicle movement on paved and unpaved roads accessing various segments of the line route;
- Engine exhaust (tailpipe emissions) from both on-road and non-road vehicles/equipment, including construction worker commuting, delivery of materials and supplies, and onsite construction activities;
- Emissions from concrete batch plants used to mix the concrete for structure and substation equipment foundations; and
- SF_6 emissions from gas-insulated circuit breakers in the switchyards.

For a discussion on valley fever associated with fugitive dust, refer to Sections 3.3.3.6, 4.3.4.1, and 4.14.4.1.

4.2.2 Methods for Analysis

4.2.2.1 Analysis Area

<u>Air Quality</u>

The air quality analysis area is a 50-km radius (approximately 31 miles) encompassing the Project. The 50-km radius was used for consistency with minimum air quality analyses required by PSD guidelines, if applicable, and the ADEQ and MDAQMD modeling guidelines.

Climate Change

For purposes of climate assessment, the conditions in the air quality study area are described, and the overall global climate with respect to emission of GHGs is discussed.

4.2.2.2 Assumptions

Air Quality and Climate Change

Appendices A and B in the Air Quality and Climate Change Baseline Technical Report (HDR 2017a) contain information about construction, operation emissions (SF_6 emissions associated with substations) and details the assumptions used for the analysis. Appendix B is an Excel spreadsheet that contains the assumptions and results of an emissions estimate for the Project. Some alternatives are longer or shorter than the Proposed Action for which emissions are estimated, but the difference in emissions for any Action Alternative compared to the one presented is small within the context of the likely accuracy of overall emissions change estimates.

To account for the minor variations in the lengths of the alternatives a ratio was applied to the emissions estimates for the Project to account for increases and decreases in the lengths of the alternatives.

4.2.2.3 Environmental Effect Indicators, Magnitude, and Duration

Project construction, maintenance, and decommissioning and, to a lesser extent, operation would result in some increase to ambient air pollutant concentrations, even though all but operation emissions would be temporary in nature. The primary indicators for determining whether or not Project emissions would result in a major impact to air quality are as follows:

- Estimated Project emissions exceed conformity de minimis thresholds; and/or
- The increase in ambient pollutant concentrations for a particular area as a result of Project emissions would result in an exceedance of the NAAQS for that area.

4.2.2.4 Methodology

Project emissions of air pollutants for each of the alternative routes under consideration are calculated on an annualized basis for the purposes of comparison between the various alternatives and subalternatives. Estimates of Project emissions are then evaluated to determine compliance with conformity thresholds and the NAAQS. NAAQS conformity analysis uses AERSCREEN, the EPA-preferred dispersion model for screening. A major impact would result should Project emissions and/or pollutant concentrations be anticipated to exceed any of the significant impact criteria. The other impact descriptions provided in Table 4.1-1 are also used herein for impacts less than major.

A conformity determination is required for each criteria pollutant or precursor where the total of direct and indirect emissions of the criteria pollutant or precursor in a Federal nonattainment or maintenance area would equal or exceed specified annual emission rates (referred to as "de minimis" thresholds). Direct and indirect Project emissions for a pollutant are regionally significant if they exceed 10 percent or more of the inventory of the pollutant emissions for a nonattainment or a maintenance area. For ozone precursors (VOCs and NO_x), Pb, PM_{10}, and $PM_{2.5}$, the de minimis thresholds depend on the severity of the nonattainment classification. For other pollutants, the threshold is set at 100 tpy.

Conformity standards do not exist for GHGs; therefore, GHG emissions are compared against the reporting thresholds outlined in 40 CFR Part 98, Subpart A of 25,000 metric tons per year (a metric ton is the equivalent of approximately 1.1 short tons). In addition, GHG emissions will need to be reported to the California Air Board under the Mandatory GHG Reporting Regulation issued January 1, 2018.

Project-related construction activity data on equipment types, numbers, and work crew size were formulated and are included in the emissions calculation spreadsheet in Appendix B of the Air Quality and Climate Change Baseline Technical Report (HDR 2017a). These data were combined with the tentative construction schedule to calculate work days for each construction activity. Team experts on transmission line construction estimated a maximum workday length at 11 hours per day. Each piece of site-based construction equipment is assumed to be used 9-11 hours per day as appropriate. Trucks that would transport people and materials to the worksites, but not be used continuously on site (e.g., pickups, dump trucks, boom trucks, concrete trucks), are assumed to operate on-site for three to five hours per day. Emissions from on-road activity for such trucks are estimated separately as described below.

Note that, while construction crew data assumed one set of crews constructing the entire line, there is a possibility of two construction spreads working at either end of the transmission line route at once. The construction plan is to have the crews start at the two ends and work toward the middle of the line. This means that, for the portion of the line in California, which is subject to CEQA emissions mitigation thresholds, and for the extreme eastern portion of the line that extends into the Phoenix O_3 nonattainment area (and is subject to general conformity mitigation emission thresholds), there would be only one spread or construction crew working at any given time. Therefore, for the purposes of general conformity mitigation thresholds, the calculations and methodology would not change with two spreads or construction crews versus one. Also, having two spreads or construction crews versus one would not change the total estimated Project emissions.

Maximum horsepower values for each equipment type were taken mostly from online equipment vendor data for the type of equipment indicated, or from similar construction projects. The average load factor for each type of equipment used in the on-site construction activities was obtained from the EPA document Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling (EPA 2010). For on-road heavy-duty trucks and pickup trucks used at the off-road construction sites, a maximum number of work days and crew members were assumed, which established the total number of “crew days”. Each crew day assumed a round trip total of 100 miles. These trucks are expected to be shut off for much of their time at the job site.

Vehicle operational information was used to estimate total horsepower hours for each equipment type for the off-road activities. These data were then multiplied by the emissions factors for calendar year 2018 taken from the EPA’s NONROAD equipment emissions model, now part of the MOVES emission model, version 2014a (EPA 2015).

Physical construction activities are tentatively scheduled for a construction period of 16 months. For this analysis, calendar year 2018 emission factors are assumed, given that they would be conservative, because fleet-average emission factors are decreasing rapidly with time as newer engines with stricter emissions standards are introduced to the fleet and older units are retired.

In addition to the non-road emissions, estimated using the types of data previously listed, on-road emissions were also estimated using data from similar sources. The MOVES emission model for calendar year 2018 on-road emission factors for short-haul combination trucks (semi-trucks) were generated for all the heavy trucks that would deliver material to the construction corridor. The MOVES emission model generated emission factors for calendar year 2018 for all worker commuting, which is conservatively assumed to consist of only one worker per commuting vehicle. The commuting vehicle mix was assumed to be 50 percent passenger cars and 50 percent light trucks and sport utility vehicles.

Besides the off-road equipment exhaust and on-road vehicle exhaust (worker commuting and material delivery) emissions, fugitive-dust (PM) emissions would be generated by:

- Paved road travel by worker commuting vehicles and paved road travel by heavy-duty trucks delivering construction materials.
- Earthmoving operations and vehicles traveling over unpaved surfaces at the construction sites and non–public access roads (general construction fugitive dust).

For general construction, fugitive dust calculations, it is assumed that dust would be controlled by watering three times per day. Based on the California Emissions Estimator Model (CalEEMod), watering three times per day can achieve 61 percent control of PM_{10} and $PM_{2.5}$ emissions (South Coast Air Quality Management District 2016).

Concrete batch plant emissions were estimated from documentation prepared by the ADEQ to support their statewide concrete batch plant General Permit (ADEQ 2016d). This documentation provides estimated short-term maximum emissions for a 2,000-cubic yard per day batch plant. Total Project concrete needs are estimated to be approximately 26,349 cubic yards (Table 2.2-13). By using the ratio of total Project needs to the emissions calculated by ADEQ for a 2,000-cubic yard/day plant, estimates were made for total Project emissions from concrete batch plants. It is expected that approximately four concrete batch plant locations would be used along the corridor, approximately one every 25 miles.

Construction Emission Calculations

Total construction emissions were determined as an aggregate of off-road exhaust, on-road exhaust, fugitive dust from road travel and general construction equipment and lastly batch plants. Off-road emissions were based on the following work schedule (Table 4.2-1) for a 114.3-mile route:

Table 4.2-1 Off-road Project Schedule

ACTIVITY	WORK DAYS
Mechanics	372
Access Road Construction	121
Foundation Installation	301
Laydown Yard Receiving	262
Structure Hauling	313
Structure Assembly	313
Structure Erection	313
Wire Stringing	183
Road/ROW Reclamation	115
Cleanup	30
Substation Construction - Grading	88
Substation Construction - Steel	120

Crew member commuting assumed a 100-mile daily round trip route per worker. All emission factors were derived from MOVES 2018 model year of vehicle for La Paz County, Arizona and assumed national default registration mixes. Commuting also assumed one crew member per vehicle with a 50%/50% ratio between passenger cars and trucks traveling at an average of 65 mph. The total number of crew members ranges between 4 and 24 depending on the activity.

Material delivery truck trips and total mileage were provided by DCRT and implemented directly for each activity type. All emission factors are based on MOVES 2018 model year vehicles for La Paz County, Arizona for heavy duty diesel fueled trucks averaging 65 mph. For further details see Appendix B of the Air Quality Baseline Technical Report (HDR 2017a).

Because of the area-wide nature of effects to air quality, impacts were not evaluated on a segment-by-segment basis; rather, impacts were evaluated on a full route alternative basis with variability for subalternatives addressed as well. Therefore, heading and document sections were eliminated for segment-specific analysis.

4.2.3 No Action Alternative

Under the No Action Alternative, no ROW would be granted for the Project and the transmission line, SCS, and ancillary facilities would not be constructed. The No Action Alternative would result in no air quality impacts from construction activities and post-construction operational survey and maintenance activities that would have occurred in conjunction with the Proposed Action or Action Alternatives.

Air quality impacts to the area could arise from any future projects or alternative uses of the land. It should be noted that if the Project is not built, the area that would have been served by the transmission line could instead become more reliant on "distributed power generation" which utilizes locally generated power in order to meet growing power demand. Localized power generation would involve the use of smaller generators (e.g., gas turbine or diesel generators) to satisfy power demand which could result in ambient air quality impacts and climate change impacts.

4.2.4 Construction of Full Route Alternative and Subalternative Effects

Emissions impacts to air quality common to all Action Alternatives include PM_{10}, $PM_{2.5}$, CO, NO_x, VOC, SO_2, and GHG such as CO_2, CH_4, and N_2O. All alternatives also include the construction of the SCS. Sources of emissions from the Project would include products of combustion from construction vehicles and construction equipment, fugitive dust from earthmoving activities during construction, and fugitive dust from unpaved roads due to vehicular traffic during construction.

4.2.4.1 Proposed Action

Fugitive particulate emissions associated with construction were derived from the total disturbed area, a control efficiency and a general construction emission factor identified in AP-42, Section 13.2.3. The total proposed disturbed area is expected to be 1,190.3 acres, which is based on 430.8 acres of access roads, material, laydown and batch plants (34.5 acres), 33.4 acres of fly yards, structure foundations (468.6 acres), pulling and snubbing sites (167.0 acres), crossings (53.5 acres) and the SCS (2.5 acres) (Table 2.2-15). A control efficiency of 61 percent (%) was established via CalEEMod for watering three times per day. The estimated controlled construction emissions would be 42.6 tons PM_{10} over a 16-month construction period. Over that same period, it would result in 4.3 tons of $PM_{2.5}$. Table 4.2-2 provides the complete construction emissions summary for the Proposed Action.

Table 4.2-2 Proposed Action Construction Emissions (tons over 16 months)

POLLUTANT	OFFROAD EXHAUST	COMMUTING EXHAUST	DELIVERY EXHAUST	PAVED ROAD FUGITIVE DUST	GENERAL CONST. FUGITIVE DUST	CONCRETE BATCH PLANTS	TOTAL
CO	17.00	11.29	5.55	NA	NA	1.26	35.10
NOx	65.67	1.11	27.42	NA	NA	1.49	95.69
PM10	3.02	0.02	0.79	3.54	38.92	0.37	46.65
PM2.5	2.94	0.01	0.72	0.87	3.89	0.33	8.76
SO2	0.09	0.01	0.08	NA	NA	0.03	0.21
VOC	7.23	0.16	0.96	NA	NA	0.04	8.39
CO2e	20,791	1,180	9,675	NA	NA	77.03	31,723

The conformity determination was conducted in accordance with the BLM's fact sheet on the air quality conformity rule, discussed in Chapter 3. The conformity de minimis thresholds are provided in Table 4.2-3 for each criteria pollutant for which nonattainment or maintenance is an issue within the Phoenix nonattainment/maintenance Area. Approximately 6 miles of the Project would lie within the boundaries of the Phoenix nonattainment/maintenance area. The remaining Proposed Action would be outside of the remaining nonattainment and/or maintenance area analyzed; however, these nonattainment and/or maintenance areas could lie within the air quality analysis area of 50 km, depending on the alterative chosen.

Table 4.2-3 Proposed Action Conformity Threshold Comparison

POLLUTANT	NAAQS STATUS	CLASSIFICATION	CONFORMITY DE MINIMIS (TON/YR)	PHOENIX NAA/MAIN. EMISSIONS (TON/YR)
Carbon Monoxide	Maintenance	Serious	100	3.16
Nitrous Oxides	O_3 Nonattainment	Moderate	100	13.10
Particulate Matter 10	Nonattainment	Serious	70	1.09
Volatile Organics	O_3 Nonattainment	Moderate	100	0.77

Ozone nonattainment emissions include a proportion of total off-road emissions, based on 6 miles of route in O_3 nonattainment versus 114.3 miles of total route. Portions of commuting and material delivery emissions in NAAQS maintenance or nonattainment areas vary by pollutant, due to varying size of Phoenix nonattainment/maintenance are for each pollutant:

- Ozone: one-half of commuting and material delivery NO_x and VOC emissions assumed to occur in the nonattainment area.
- PM_{10}: one-third of commuting and material delivery exhaust, and paved road PM_{10} emissions assumed in the nonattainment area.
- CO: one-fourth of commuting and material delivery CO emissions assumed in maintenance area
- Chinook helicopter emissions were excluded because they are not being used in or around the Phoenix nonattainment/maintenance area.

The MDAQMD provides both daily and annual significance thresholds that are applied in the analysis of the Riverside corridor activities of the Proposed Action. The Riverside County portion is approximately 20 miles in length; thus the total Proposed Action emissions were multiplied by 20/114.3 except for the batch plants. As stated earlier, each plant would be spaced approximately every 25 miles (one batch plant in California). Table 4.2-4 compares the estimated Proposed Action emissions that would occur within California to the MDAQMD thresholds. There is potential for emissions to reach Imperial County; however, a formal evaluation was not performed because all emissions are created in Riverside County only.

Riverside County has a Climate Action Plan with a threshold of 3,000 MT CO2e per year for development projects. The Project has only temporary construction emissions within Riverside County. Pursuant to CAP Screening Tables document, construction emissions are amortized over 30 years (average economic life of a development project). Amortizing 3,420 MT CO2e construction emissions across 30 years results in 114 MT CO2e/year. Adding construction emissions to operation and maintenance emissions equals 1,048 MT CO2e/yr. Riverside County determined projects below the 3,000 MT CO2e screening threshold are considered less than significant. Therefore, GHG emissions associated with the Project would result in a less-than-significant impact on the environment as it pertains to the Riverside County Climate Action Plan.

Table 4.2-4 California Construction Emissions/MDAQMD Comparison

POLLUTANT	PROPOSED ACTION	SIGNIFICANCE THRESHOLD (MDAQMD)	PROPOSED ACTION	SIGNIFICANCE THRESHOLD (MDAQMD)
	(TONS/YR)*		(LB/DAY)*	
CO	4.59	100	72.55	548
NO_x	9.80	25	115.26	137
PM_{10}	6.11	15	53.13	82
$PM_{2.5}$	1.12	12	18.41	65
SO_2	0.03	25	1.17	137
VOC	1.01	25	8.13	137
CO_2e	3,780	100,000	27,772	548,000

The NO_x significance threshold would be exceeded in Imperial County, but that only would occur if all Riverside County emissions are assumed to travel into Imperial County. The distance between the Project and the county line is 15-20 km. To exceed the significance threshold, 86.8 percent of the emissions would have to reach Imperial County. Additionally, the estimates shown in Table 4.2-4 assume maximum operation of the batch plant and OHVs occurring simultaneously throughout the day. While theoretically possible, it is very unlikely to occur. Lastly, Imperial County Air Pollution Control District (ICAPCD) personnel were contacted and any potential ozone impacts that may occur from this Project would be addressed during the permitting process with MDAQMD. ICAPCD would be consulted as necessary which may include equipment lists and other pertinent information associated with the nonattainment area.

Both the emissions that occur in Riverside County, California and within the Phoenix nonattainment/maintenance area would be well below applicable significance thresholds. As a result, the impacts associated with the Proposed Action are considered minor and in compliance with applicable NAAQS.

ADEQ provides Permitting Exemption Thresholds with their modeling guidance which indicates that the ambient air quality modeling is not necessary for those pollutants that are below those values on an annual basis. Table 4.2-5 outlines those thresholds and compares them to the Proposed Action emissions. Note that the emissions shown below are those that would occur within the borders of Arizona of the remaining 94.3 miles (20 miles within California). Note that three of the four batch plants would be assumed to operate within Arizona and the EPA GHG reporting threshold was used for CO_2e significance comparisons.

Table 4.2-5 Arizona Construction Emissions/ADEQ Threshold Comparison

POLLUTANT	PROPOSED ACTION	SIGNIFICANCE THRESHOLD
	(TONS/YR)	
CO	21.7	50
NO_x	59.1	20
PM_{10}	28.9	7.5
$PM_{2.5}$	5.4	5
SO_2	0.1	20
VOC	5.2	20
CO_2e	19,525	25,000

Most pollutants would remain below the permitting threshold and do not require modeling, but $PM_{2.5}$, PM_{10} and NO_x emissions would exceed the threshold. Screening methods such as the EPA-approved AERSCREEN can be used to predict concentration levels of criteria pollutants to demonstrate compliance with the NAAQS, increment thresholds, and SILs. Construction emissions are not fixed to any one point, but range over a wide geographic area. Therefore, Proposed Action emissions would already be widely dispersed. Additionally, construction emissions are transient in nature, and any impacts to air quality from construction sources would disappear along with these sources. Operational emissions would be substantially lower than those of construction emissions. Nevertheless, the BLM has conducted recent screening level analyses for transmission line construction projects of comparable or greater-sized projects. The screening level modeling is presented for each individual route group and compared with the SIL for various air pollutants and short-term averaging periods. If the dispersion modeling impacts are predicted to exceed the applicable SIL, or if there is not a defined EPA SIL, the Proposed Action impact has been added to a representative background concentration and the total has been compared with the applicable ambient standards (Federal or state) (BLM 2013a; BLM 2013b).

To determine whether the Proposed Action's construction emissions would have an impact to the ambient air, the expected Proposed Action impacts are first compared to respective SILs.

Table 4.2-6 compares the screening level maximum short-term (e.g., 1-hour and 24-hour) pollutant concentrations from construction activities to the respective SIL.

Maximum AERSCREEN values were derived from the Sun Zia EIS, Route 3 modeling results, since it was a previously approved and comparable project for use. Emissions associated with the construction of one circuit line equated to the maximum concentration for Route 3. The Sun Zia Route 3 is comparable because the line is 500 kV and the lengths are nearly identical to the Proposed Action and Action Alternatives. Additionally, the construction equipment is comparable, and the surrounding terrain is consistent as the Sun Zia Project runs through southern Arizona and New Mexico. The emissions for the Proposed Action were then determined via a ratio of the Sun Zia results.

Table 4.2-6 Proposed Action SIL Comparison

POLLUTANT	AVERAGING PERIOD	MAX 1-HR AERSCREEN (µG/M^3)*	SIL (µG/M^3)	OVER THE SIL?
NO_2	1-hour	66.9	7.5	Yes
$PM_{2.5}$	24-hour	3.7	1.2	Yes
PM_{10}	24-hour	15.5	5	Yes

Note: µg/m3= micrograms per cubic meter. *Maximum AERSCREEN concentrations obtained from comparable and larger transmission line/substation construction projects (BLM 2013a, 2013b).

AERSCREEN is a conservative tool that replaced SCREEN 3 and it is still the preferred screening model by the EPA. The layout of AERSCREEN produces estimates of 1-hr worst-case single source concentrations and conversion factors are applied for other averages periods. It is intended to produce equal to or are greater than estimates as though developed by AERMOD. There is a general linear relationship between concentration output and emission rate input when applying AERSCREEN. It also applies varying meteorological data that is derived from land use categories. The land use is very similar to this Project and the Sun Zia EIS as both routes are within the arid southwestern U.S. While it is unclear what the exact equipment fleet was used in the Sun Zia EIS, the project size often dictates the equipment needed. Because both projects are 500 kV it is plausible that equipment fleet would be similar. Also, if the impact of the Project were to be doubled, the Project would remain compliant with all applicable NAAQS.

For example, the Proposed Action would generate 28.9 tons/yr of PM_{10}, while the Sun Zia single line for Route 3 was 143.7 tons/yr. Thus, the 77.4 µg/m^3 resulted in 15.5 µg/m^3 for the Proposed Action. The Sun Zia $PM_{2.5}$ emissions maximum was 15.4 tons/yr, which correlated to 10.6 µg/m^3. The Proposed Action would generate 5.4 tons and 3.7 µg/m^3. Similarly, 19.9 tons/yr NO_2 resulted in 22.5 µg/m^3. The Proposed Action emissions would be 59.1 tons/yr or 66.9 µg/m^3.

If the screening level modeling predicted exceedances of the SIL, the Project impact would be added to a representative background concentration and the sum would be compared to the applicable air quality standard. Background concentrations were obtained from nearby ambient air monitoring sites and available for further review in the associated Air Quality and Climate Change Baseline Technical Report (HDR 2017a). These background concentrations represent ambient concentrations of air quality pollutants contributed by other air pollutant emission sources within the airshed. Table 4.2-7 presents a comparison of the expected maximum short-term AERSCREEN concentrations from Project construction, representative background concentrations of NO_2 and PM_{10}, and the applicable ambient air quality standards. As shown, the Project would not exceed the NAAQS.

Table 4.2-7 Proposed Action NAAQS Impact

POLLUTANT	AVERAGING PERIOD	MAX 1-HR AERSCREEN (µG/M^3)	BACKGROUND (µG/M^3)*	TOTAL (µG/M^3)	NAAQS (µG/M^3)
NO_2	1-hour	66.9	10.34	77.2	188
$PM_{2.5}$	24-hour	3.7	7.5	11.2	35
PM_{10}	24-hour	15.5	72.5	88.0	150

* Background values are derived as a three-year average between 2013-2015 at the Wenden, AZ met site. Parts per billion from the monitors was converted to µg/m^3 by multiplying the ppb value by 1.88 for NO_2.

Climate Change

The total combined GHG construction emissions are anticipated to be well below the 100,000-ton significance threshold outlined by MDAQMD and the EPA and ARB reporting threshold of 25,000 metric tons of CO_2e per year, regardless of the full route alternative or subalternative chosen. As an example, the total GHG construction emissions from the use of all the Proposed Action segments would result in GHG emissions of approximately 23,792 tons (21,584 metric tons) of CO_2e per year. The California portion of the Proposed Action would generate 3,780 tons/yr (3,429 metric tons/yr). The substitution of other segments, alternatives, or subalternatives variations would be similar. Additionally, these projections are over the entire duration of Project activities over several years and the entire geographic distance. Therefore, emissions from the Project would be much less than the reporting thresholds and would be a tiny fraction of the existing annual Federal and state emissions.

The total GHG operations emissions per year combined for the Proposed Action due to potential SF_6 emission leaks would be approximately 835.7 tons of CO_2e per year (758.1 metric tons ($MTCO_2e$)), which is below the MDAQMD significance indicator of 100,000 tons. The total GHG operations emissions per year for any of the Action Alternatives would be comparable to those for the Proposed Action (Section 3.2.3.3).

The 2016 Greenhouse Reporting data was reviewed to assess regional GHG emissions relative to the Project. The MDAQMD comprises portions of two California counties: Riverside and San Bernardino. All GHG emissions were derived from wildfires, prescribed fires, or mobile traffic. The two counties equated to approximately 11.4 million metric tons of CO_2e emissions. The total emissions associated with the Project (~3,429 metric tons per year in California) would result in a minimal impact to the surrounding area relative to current GHG emissions.

Climate change has occurred naturally, throughout geologic time. Recent climate change stemming from the rapid increase in atmospheric CO_2 and human-generated GHGs has coincided with societal industrialization and human population growth. The construction period is 1.0 – 1.5 years and the natural and anthropogenic sources that scientists predict will lead to significant changes in global temperatures and weather patterns would continue during and beyond the Project period. It is difficult to state with absolute certainty what impacts GHG emissions from the Project would have on climate change, or to what extent the Project would contribute to those impacts. However, based upon the estimated total Project emissions, it is very unlikely that the Project alone would have an adverse impact locally or globally. To understand eventual impacts, it is essential to consider at the same time cumulative effects when compared to those of the Project and along with all other surrounding sources at different scales of time and space.

Summary

Air Quality
The Proposed Action would not have an adverse impact to air quality for the following reasons:

The Proposed Action's emissions of criteria air pollutants would not exceed the conformity emissions thresholds for the Phoenix NAA/Maintenance area. The criteria pollutant emissions would not exceed the daily and annual MDAQMD significance thresholds for the Riverside corridor of the Proposed Action. It should be noted that it is theoretically possible that if all of the Riverside corridor emissions passed into Imperial County, the daily significance level for NOx could be exceeded at maximum capacity. ICAPCD has been notified and they confirmed that they would consult with MDAQMD during the permitting process as needed.

As stated previously, ADEQ provides Permitting Exemption Thresholds with their modeling guidance which indicates that the ambient air quality modeling is not necessary for those pollutants that are below those values on an annual basis. CO, SO_2, and VOC would not exceed the ADEQ Permitting Exemption thresholds, indicating that those emissions would not exceed the NAAQS.

NO_x, $PM_{2.5}$, and PM_{10} emissions for the Proposed Action would exceed the ADEQ Permitting Exemption Thresholds, but further analysis indicates that the maximum short-term AERSCREEN concentrations from the Proposed Action construction plus representative background concentrations of NO_2, $PM_{2.5}$, and PM_{10} would not exceed the applicable ambient air quality standards.

The MDAQMD recommends that ambient air quality modeling be conducted when project emissions exceed their significance thresholds (shown in Table 4.2-4). If the emissions from the Proposed Action would not exceed the thresholds it is assumed that there would not be a violation of the CAAQS.

Climate Change
The Proposed Action would not have an adverse impact to climate change for the following reasons:

The Proposed Action construction GHG emissions would be less than the 25,000 $MTCO_2e$ reporting thresholds and would be temporary in nature. Operational emissions would be long term, but they would be substantially below the 25,000 $MTCO2_e$ reporting thresholds.

4.2.4.2 Alternative 1 – I-10 Route

Table 4.2-8 presents the estimated total fugitive dust, criteria pollutants, and GHG potential air emissions from proposed construction activities for this alternative. Estimated emissions from construction of various subalternatives are presented for comparative purposes. For specifics regarding segments and replacement segments per zone refer to Sections 2.4.7.1 through 2.4.7.4 and Tables 2.4-13 through 2.4-14. Each subalternative length listed in the table is the difference between the replacing segments and the segments being replaced within Alternative 1.

Table 4.2-8 Alternative 1 Total Project Emissions (tons)

POLLUTANT	PROPOSED ACTION	ALTERNATIVE 1	ALTERNATIVE 1 SUBALTERNATIVES					MAXIMUM
			1A	1B	1C	1D	1E	
Total Miles	114.3	111.6	113.1	117.1	112.7	112.7	114.0	117.1
Fugitive Dust - Construction								
$PM_{2.5}$	3.89	3.80	3.85	3.99	3.84	3.84	3.88	3.99
PM_{10}	38.92	38.00	38.51	39.87	38.38	38.38	38.82	39.87
Fugitive Dust – Paved Road								
$PM_{2.5}$	0.87	0.85	0.86	0.89	0.86	0.86	0.87	0.89
PM_{10}	3.54	3.46	3.50	3.63	3.49	3.49	3.53	3.63
Commuting/Delivery/Off-road Exhaust/Batch Plant								
CO	35.10	34.27	34.73	35.96	34.61	34.61	35.01	35.96
NO_x	95.69	93.43	94.69	98.04	94.35	94.35	95.44	98.04
$PM_{2.5}$	4.00	4.09	4.14	4.29	4.13	4.13	4.18	4.29
PM_{10}	4.19	3.91	3.96	4.10	3.95	3.95	3.99	4.10
SO_2	0.21	0.21	0.21	0.22	0.21	0.21	0.21	0.22
VOC	8.39	8.20	8.31	8.60	8.28	8.28	8.37	8.60
CO_2e	31,723	30,974	31,390	32,500	31,279	31,279	31,640	32,500
Total $PM_{2.5}$	8.76	8.56	8.67	8.98	8.64	8.64	8.74	8.98
Total PM_{10}	46.65	45.55	46.16	47.79	46.00	46.00	46.53	47.79

Temporary portable concrete batch plants would be constructed and operated approximately every 25 miles along the ROW, mainly at construction staging areas. The maximum number of concrete batch plants and the total anticipated emissions from construction and operation of batch plants are provided in Table 4.2-9. The total emissions for Alternative 1 is assumed to include four batch plants, which is equivalent to the Proposed Action. However, the total concrete generated differs slightly. The emissions from the concrete batch plants have been included in Table 4.2-8.

Table 4.2-9 Alternative 1 Concrete Batch Plant Total Project Emissions (tons)

SCENARIO	MAXIMUM QUANTITY	CO	NO_X	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2E
Proposed Action	4	1.26	1.49	0.33	0.37	0.03	0.04	77.03
Alternative 1	4	1.29	1.53	0.34	0.38	0.03	0.04	78.91

As initially outlined in Section 4.2.4.1, ozone nonattainment emissions include a proportion of total off-road emissions, based on 6 miles in O_3 nonattainment versus 117.1 miles of the maximum length among Alternative 1 and Alternative 1 subalternatives. Portions of commuting and material delivery emissions in NAAQS maintenance or nonattainment areas vary by pollutant, due to varying size of Phoenix nonattainment/maintenance are for each pollutant:

- Ozone: one-half of commuting and material delivery NOx and VOC emissions assumed to occur in the nonattainment area.
- PM_{10}: one-third of commuting and material delivery exhaust, and paved road PM10 emissions assumed in the nonattainment area.
- CO: one-fourth of commuting and material delivery CO emissions assumed in maintenance area.
- Chinook helicopter emissions were excluded because they are not being used in or around the Phoenix nonattainment/maintenance area.

As shown in Table 4.2-10, all variations of Alternative 1 would be below the conformity levels as outlined by the Phoenix nonattainment/maintenance area.

Table 4.2-10 Alternative 1 Conformity Threshold Comparison

POLLUTANT	NAAQS STATUS	CLASSIFICATION	CONFORMITY DE MINIMIS (TON/YR)	PHOENIX NAA/MAIN. EMISSIONS (TON/YR)
Carbon Monoxide	Maintenance	Serious	100	3.24
Nitrous Oxides	O_3 Nonattainment	Moderate	100	13.42
Particulate Matter 10	Nonattainment	Serious	70	1.11
Volatile Organics	O_3 Nonattainment	Moderate	100	0.78

The California portion is approximately 17.1 miles in length, thus total Project emissions were multiplied by 17.1/117.1 except for the batch plants. As stated earlier, each plant would be spaced approximately every 25 miles (one batch plant in California). Table 4.2-11 compares the estimated California emissions to the MDAQMD thresholds.

Table 4.2-11 California Construction Alternative 1/MDAQMD Comparison

POLLUTANT	ALTERNATIVE 1	SIGNIFICANCE THRESHOLD (MDAQMD)	ALTERNATIVE 1	SIGNIFICANCE THRESHOLD (MDAQMD)
	(TONS/YR)		(LB/HR)	
CO	3.96	100	68.31	548
NO_x	8.47	25	106.33	137
PM_{10}	5.22	15	47.21	82
$PM_{2.5}$	0.97	12	17.38	65
SO_x	0.03	25	1.14	137
VOC	0.86	25	7.16	137
CO_2e	3,234	100,000	24,131	548,000

The NO_x significance threshold would be exceeded in Imperial County, but that only would occur if all Riverside County emissions are assumed to travel into Imperial County. The distance between the Project and the county line is 15-20 km. To exceed the significance threshold, 94.0 percent of the emissions would have to reach Imperial County. Additionally, the estimates shown in Table 4.2-11 assume maximum operation of the batch plant and OHVs occurring simultaneously throughout the day. While theoretically possible, it is very unlikely to occur. Lastly, ICAPCD personnel were contacted and any potential ozone impacts that may occur from this Project would be addressed during the permitting process with MDAQMD. ICAPCD would be consulted as necessary which may include equipment lists and other pertinent information associated with the nonattainment area.

Both the emissions that would occur in Riverside County, California and within the Phoenix nonattainment/maintenance area would be well below applicable significance thresholds. As a result, the impacts associated with Alternative 1 are considered minor and in compliance with applicable NAAQS.

ADEQ provides Permitting Exemption Thresholds with their modeling guidance which indicates that the ambient air quality modeling is not necessary for those pollutants that are below those values on an annual basis. Table 4.2-12 outlines those thresholds and compares them to the Alternative 1 emissions. Note that the emissions shown below are those that would occur within the borders of Arizona of the remaining 100 miles (17.1 miles within California). Note that four of the five batch plants would be assumed to operate within Arizona and the EPA GHG reporting threshold was used for CO_2e significance comparisons.

Table 4.2-12 Arizona Construction Alternative 1/ADEQ Threshold Comparison

POLLUTANT	ALTERNATIVE 1	SIGNIFICANCE THRESHOLD
	(TONS/YR)	
CO	22.93	50
NO_x	62.67	20
PM_{10}	30.60	7.5
$PM_{2.5}$	5.74	5
SO_2	0.14	20
VOC	5.50	20
CO_2e	20,810	25,000

Table 4.2-13 compares the screening level maximum short-term (e.g., 1-hour and 24-hour) pollutant concentrations from construction activities to the respective SIL.

Table 4.2-13 Alternative 1 SIL Comparison

POLLUTANT	AVERAGING PERIOD	MAX 1-HR AERSCREEN (µG/M^3)*	SIL (µG/M^3)	OVER THE SIL?
NO_2	1-hour	70.9	7.5	Yes
$PM_{2.5}$	24-hour	4.0	1.2	Yes
PM_{10}	24-hour	16.5	5	Yes

Note: µg/m^3= micrograms per cubic meter. *Maximum AERSCREEN concentrations obtained from comparable and larger transmission line/substation construction projects (BLM 2013a, 2013b).

Based upon values derived from the Sun Zia EIS, Route 3 modeling results as described above, emissions from Alternative 1 would generate 30.6 tons/yr of PM_{10}, while the Sun Zia single line for Route 3 was 143.7 tons/yr. Thus, the 77.4 µg/m^3 resulted in 16.5 µg/m^3 for Alternative. The Sun Zia $PM_{2.5}$ emissions maximum was 15.4 tons/yr, which correlated to 10.6 µg/m^3. Alternative 1 would generate 5.7 tons and 4.0 µg/m^3. Similarly, 19.9 tons/yr NO_2 resulted in 22.5 µg/m^3. Alternative 1 emissions would be 62.7 tons/yr or 70.9 µg/m^3.

Table 4.2-14 presents a comparison of the expected maximum short-term AERSCREEN concentrations from construction activities, representative background concentrations of NO_2 and PM_{10}, and the applicable ambient air quality standards. As shown, Alternative 1 would not exceed the NAAQS.

Table 4.2-14 Alternative 1 NAAQS Impact

POLLUTANT	AVERAGING PERIOD	MAX 1-HR AERSCREEN (µG/M^3)*	BACKGROUND (µG/M^3)*	TOTAL (µG/M^3)	NAAQS (µG/M^3)
NO_2	1-hour	70.9	10.34	81.2	188
$PM_{2.5}$	24-hour	4.0	7.5	11.5	35
PM_{10}	24-hour	16.5	72.5	89.0	150

* Background values are derived as a three-year average between 2013-2015 at the Wenden, AZ met site. Parts per billion from the monitors was converted to µg/m^3 by multiplying the ppb value by 1.88.

Summary

Air Quality
Alternative 1 would not have an adverse impact to air quality for the following reasons:

The emissions of criteria air pollutants would not exceed the conformity emissions thresholds for the Phoenix NAA/Maintenance area. The criteria pollutant emissions would not exceed the daily and annual MDAQMD significance thresholds for the Riverside corridor of Alternative 1.

As stated previously, ADEQ provides Permitting Exemption Thresholds with their modeling guidance which indicates that the ambient air quality modeling is not necessary for those pollutants that are below those values on an annual basis. CO, SO_2, and VOC would not exceed the ADEQ Permitting Exemption thresholds, indicating that those emissions would not exceed the NAAQS.

NO_x, $PM_{2.5}$, and PM_{10} emissions for Alternative 1 would not exceed the ADEQ Permitting Exemption Thresholds, but further analysis indicates that the maximum short-term AERSCREEN concentrations from the Alternative 1 construction activities, plus representative background concentrations of NO_2 and PM_{10} would not exceed the applicable ambient air quality standards.

The MDAQMD recommends that ambient air quality modeling be conducted when project emissions exceed their significance thresholds (shown in Table 4.2-11). If the emissions from Alternative 1 would not exceed the thresholds, it is assumed that there would not be a violation of the CAAQS.

Climate Change
Alternative 1 would not have an adverse impact to climate change for the following reasons:

The construction GHG emissions would be less than the 25,000 $MTCO_2e$ reporting thresholds and are temporary in nature. Operational emissions would be long term, but they would be substantially below the 25,000 $MTCO_2e$ reporting thresholds. To the extent Alternative 1 would allow for the displacement of fossil fuel energy generation with renewable energy sources there would be a beneficial contribution to anthropogenic climate change.

Subalternatives to Alternative 1 (1A through 1E)

Subalternatives to Alternative 1 would result in similar emissions estimates and therefore, there would be no adverse impacts to air quality and climate change.

4.2.4.3 Alternative 2 – BLM Utility Corridor Route

Table 4.2-15 presents the estimated total air emissions from proposed construction activities for this alternative. Estimated emissions from proposed construction of various subalternatives are presented for comparative purposes. For specifics regarding segments and replacement per zone refer to Sections 2.4.7.1 through 2.4.7.4 and Tables 2.4-15 through 2.4-16. Each subalternative length listed in the table is the difference between the replacing segments and the segments being replaced within Alternative 2.

Table 4.2-15 Alternative 2 Total Projects Emissions (tons)

POLLUTANT	PROPOSED ACTION	ALTERNATIVE 2	ALTERNATIVE 2 SUBALTERNATIVES					MAXIMUM
			2A	2B	2C	2D	2E	
Total Miles	114.3	125.8	123.5	128.8	125.4	126.4	123.8	128.8
Fugitive Dust – Construction								
$PM_{2.5}$	3.89	4.28	4.21	4.39	4.27	4.30	4.22	4.39
PM_{10}	38.92	42.84	42.05	43.86	42.70	43.04	42.16	43.86
Fugitive Dust – Paved Road								
$PM_{2.5}$	0.87	0.96	0.94	0.98	0.95	0.96	0.94	0.98
PM_{10}	3.54	3.90	3.83	3.99	3.88	3.92	3.84	3.99
Commuting/Delivery/Off-road Exhaust/Batch Plant								
CO	35.10	38.63	37.92	39.55	38.51	38.82	38.02	39.55
NO_x	95.69	105.32	103.39	107.83	104.98	105.82	103.64	107.83
$PM_{2.5}$	4.00	4.61	4.53	4.72	4.60	4.63	4.54	4.72
PM_{10}	4.19	4.40	4.32	4.51	4.39	4.42	4.33	4.51
SO_2	0.21	0.24	0.23	0.24	0.23	0.24	0.23	0.24
VOC	8.39	9.24	9.07	9.46	9.21	9.28	9.09	9.46
CO_2e	31,723	34,915	34,276	35,747	34,804	35,081	34,360	35,747
Total $PM_{2.5}$	8.76	9.64	9.47	9.87	9.61	9.69	9.49	9.87
Total PM_{10}	46.65	51.34	50.40	52.57	51.18	51.59	50.53	52.57

Temporary portable concrete batch plants would be constructed and operated approximately every 25 miles along the ROW, mainly at construction staging areas. The maximum number of concrete batch plants and the total anticipated emissions from construction and operation of batch plants are provided in Table 4.2-16. The total emissions for Alternative 2 is assumed to have four batch plants. The emissions from the concrete batch plants have been included in Table 4.2-15.

Table 4.2-16 Alternative 2 Concrete Batch Plant Annual Emissions (tpy)

SCENARIO	MAXIMUM QUANTITY	CO	NO_X	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2E
Proposed Action	4	1.26	1.49	0.33	0.37	0.03	0.04	77.03
Alternative 2	4	1.41	1.68	0.37	0.42	0.03	0.05	86.80

As initially outlined in Section 4.2.4.1, ozone nonattainment emissions include a proportion of total off-road emissions, based on 6 miles of route in O_3 nonattainment versus 128.8 miles of the maximum length among Alternative 2 and all subalternative routes. Portions of commuting and material delivery emissions in NAAQS maintenance or nonattainment areas vary by pollutant, due to varying size of Phoenix nonattainment/maintenance are for each pollutant:

- Ozone: one-half of commuting and material delivery NO_x and VOC emissions assumed to occur in the nonattainment area.
- PM_{10}: one-third of commuting and material delivery exhaust, and paved road PM_{10} emissions assumed in the nonattainment area.
- CO: one-fourth of commuting and material delivery CO emissions assumed in maintenance area.
- Chinook helicopter emissions were excluded because they are not being used in or around the Phoenix nonattainment/maintenance area.

As shown in Table 4.2-17, all variations of Alternative 2 are below the conformity levels as outlined by the Phoenix nonattainment/maintenance area.

Table 4.2-17 Alternative 2 Conformity Threshold Comparison

POLLUTANT	NAAQS STATUS	CLASSIFICATION	CONFORMITY DE MINIMIS (TON/YR)	PHOENIX NAA/MAIN. EMISSIONS (TON/YR)
Carbon Monoxide	Maintenance	Serious	100	3.56
Nitrous Oxides	O_3 Nonattainment	Moderate	100	14.76
Particulate Matter 10	Nonattainment	Serious	70	1.22
Volatile Organics	O_3 Nonattainment	Moderate	100	0.86

The California portion is approximately 21.8 miles in length, thus the total Project emissions are multiplied by 21.8/128.8 except for the batch plants. As stated earlier, each plant would be spaced approximately every 25 miles (one batch plant in California). Table 4.2-18 compares the estimated California emissions to the MDAQMD thresholds.

Table 4.2-18 California Construction Alternative 2/MDAQMD Comparison

POLLUTANT	ALTERNATIVE 2	SIGNIFICANCE THRESHOLD	ALTERNATIVE 2	SIGNIFICANCE THRESHOLD
	(TONS/YR) *		(LB/HR)	
CO	4.99	100	75.16	548
NO_x	10.99	25	123.14	137
PM_{10}	6.64	15	56.68	82
$PM_{2.5}$	1.22	12	19.06	65
SO_x	0.03	25	1.18	137
VOC	1.11	25	8.79	137
CO_2e	4,157	100,000	30,285	548,000

The NO_x significance threshold would be exceeded in Imperial County, but that only would occur if all Riverside County emissions are assumed to travel into Imperial County. The distance between the Project and the county line is 15-20 km. To exceed the significance threshold, 81.2 percent of the emissions would have to reach Imperial County. Additionally, the estimates shown in Table 4.2-18 assume maximum operation of the batch plant and OHVs occurring simultaneously throughout the day. While theoretically possible, it is very unlikely to occur. Lastly, ICAPCD personnel were contacted and any potential ozone impacts that may occur from this Project would be addressed during the permitting process with MDAQMD. ICAPCD would be consulted as necessary which may include equipment lists and other pertinent information associated with the nonattainment area.

Both the emissions that would occur in Riverside County, California and within the Phoenix nonattainment/maintenance area would be well below applicable significance thresholds. Thus, the impacts associated with Alternative 2 are considered minor and in compliance with applicable NAAQS.

ADEQ provides Permitting Exemption Thresholds with their modeling guidance which indicates that the ambient air quality modeling is not necessary for those pollutants that are below those values on an annual basis. Table 4.2-19 outlines those thresholds and compares them to the Alternative 2 emissions. Note that the emissions shown below are those that would occur within the borders of Arizona of the remaining 107 miles (21.8 miles within California). Note that three of the four batch plants would be assumed to operate within Arizona and the EPA GHG reporting threshold was used for CO_2e significance comparisons.

Table 4.2-19 Arizona Construction Alternative 2/ADEQ Threshold Comparison

POLLUTANT	ALTERNATIVE 2	SIGNIFICANCE THRESHOLD
	(TONS/YR)	
CO	24.56	50
NO_x	67.08	20
PM_{10}	32.75	7.5
$PM_{2.5}$	6.15	5
SO_2	0.15	20
VOC	5.89	20
CO_2e	22,268	25,000

Table 4.2-20 compares the screening level maximum short-term (e.g., 1-hour and 24-hour) pollutant concentrations from construction activities to the respective SIL.

Table 4.2-20 Alternative 2 SIL Comparison

POLLUTANT	AVERAGING PERIOD	MAX 1-HR AERSCREEN (µG/M^3)*	SIL (µG/M^3)	OVER THE SIL?
NO_2	1-hour	75.8	7.5	Yes
$PM_{2.5}$	1-hour	4.2	1.2	Yes
PM_{10}	24-hour	17.6	5	Yes

Note: µg/m^3= micrograms per cubic meter. *Maximum AERSCREEN concentrations obtained from comparable and larger transmission line/substation construction projects (BLM 2013a, 2013b).

Based upon the values derived from the Sun Zia EIS, Route 3 modeling results as described above, emissions from Alternative 2 would generate 32.75 tons/yr of PM_{10} (6.15 tons/yr $PM_{2.5}$), while the Sun Zia single line for Route 3 was 143.7 tons/yr (15.4 tons/yr $PM_{2.5}$). Thus, the 77.4 µg/m^3 (10.6 µg/m^3 $PM_{2.5}$) resulted in 17.6 µg/m^3 (4.2 µg/m^3 $PM_{2.5}$) for Alternative 2. Similarly, 19.9 tons/yr NO_2 resulted in 22.5 µg/m^3. Alternative 2 emissions would be 67.08 tons/yr or 75.8 µg/m^3.

Table 4.2-21 presents a comparison of the expected maximum short-term AERSCREEN concentrations from construction activities, representative background concentrations of NO_2 and PM_{10}, and the applicable ambient air quality standards. As shown, Alternative 2 would not exceed the NAAQS.

Table 4.2-21 Alternative 2 NAAQS Impact

POLLUTANT	AVERAGING PERIOD	MAX 1-HR AERSCREEN (μG/M³)*	BACKGROUND (μG/M³)*	TOTAL (μG/M³)	NAAQS (μG/M³)
NO_2	1-hour	75.8	10.34	86.1	188
$PM_{2.5}$	1-hour	4.2	7.5	11.7	35
PM_{10}	24-hour	17.6	72.5	90.1	150

* Background values are derived as a three-year average between 2013-2015 at the Wenden, AZ met site. Parts per billion from the monitors was converted to μg/m³ by multiplying the ppb value by 1.88 for NO_2.

Summary

Air Quality
Alternative 2 would not have an adverse impact to air quality for the following reasons:

Emissions of criteria air pollutants would not exceed the conformity emissions thresholds for the Phoenix NAA/Maintenance area. The criteria pollutant emissions would not exceed the daily and annual MDAQMD significance thresholds for the Riverside corridor of Alternative 2.

As stated previously, ADEQ provides Permitting Exemption Thresholds with their modeling guidance which indicates that the ambient air quality modeling is not necessary for those pollutants that are below those values on an annual basis. CO, SO_2, and VOC would not exceed the ADEQ Permitting Exemption thresholds, indicating that those emissions would not exceed the NAAQS.

NO_x, $PM_{2.5}$, and PM_{10} emissions for Alternative 2 would exceed the ADEQ Permitting Exemption Thresholds, but further analysis indicates that the maximum short-term AERSCREEN concentrations from Alternative 2 construction activities, plus representative background concentrations of NO_2 and PM_{10}, would not exceed the applicable ambient air quality standards.

The MDAQMD recommends that ambient air quality modeling be conducted when project emissions exceed their significance thresholds (Table 4.2-4). If the emissions from the Alternative 2 would not exceed the thresholds it is assumed that there would not be a violation of the CAAQS.

Climate Change
Alternative 2 would not have an adverse impact to climate change for the following reasons:

Alternative 2 construction GHG emissions would be less than the 25,000 $MTCO_2e$ reporting thresholds and would be temporary in nature. Operational emissions would be long term, but they are substantially below the 25,000 $MTCO_2e$ reporting thresholds. To the extent Alternative 2 allows for the displacement of fossil fuel energy generation with renewable energy sources there would be a beneficial contribution to anthropogenic climate change.

Subalternatives to Alternative 2 (2A through 2E)

Subalternatives to Alternative 2 would result in similar emissions estimates; therefore, there would be no adverse impacts to air quality and climate change.

4.2.4.4 Alternative 3 – Avoidance Route

Table 4.2-22 presents the estimated total air emissions from proposed construction activities for Alternative 3. Estimated emissions from proposed construction of various sub alternatives are presented for comparative purposes. For specifics regarding segments and replacement per zone refer to Sections 2.4.7.1 through 2.4.7.4 and Tables 2.4-18 through 2.4-20. Each subalternative length listed in the table is the difference between the replacing segments and the segments being replaced within Alternative 3.

Table 4.2-22 Alternative 3 Total Project Emissions (tons) for Subalternatives 3A – 3F

POLLUTANT	PROPOSED ACTION	ALTERNATIVE 3	ALTERNATIVE 3 SUBALTERNATIVES						MAXI-MUM
			3A	3B	3C	3D	3E	3F	
Total Miles	114.3	123.0	123.7	120.3	122.0	122.2	122.2	122.2	123.7
Fugitive Dust - Construction									
$PM_{2.5}$	3.89	4.19	4.21	4.10	4.15	4.16	4.16	4.16	4.21
PM_{10}	38.92	41.88	42.12	40.96	41.54	41.61	41.61	41.61	42.12
Fugitive Dust – Paved Road									
$PM_{2.5}$	0.87	0.94	0.94	0.91	0.93	0.93	0.93	0.93	0.94
PM_{10}	3.54	3.81	3.83	3.73	3.78	3.79	3.79	3.79	3.81
Commuting/Delivery/Off-road Exhaust/Batch Plant									
CO	35.10	37.77	37.99	36.94	37.46	37.53	37.53	37.53	37.99
NO_x	95.69	102.98	103.56	100.71	102.14	102.31	102.31	102.31	103.56
$PM_{2.5}$	4.00	4.51	4.53	4.41	4.47	4.48	4.48	4.48	4.53
PM_{10}	4.19	4.31	4.33	4.21	4.27	4.28	4.28	4.28	4.33
SO_2	0.21	0.23	0.23	0.22	0.23	0.23	0.23	0.23	0.23
VOC	8.39	9.03	9.08	8.83	8.96	8.97	8.97	8.97	9.08
CO_2e	31,723	34,138	34,332	33,388	33,860	33,916	33,916	33,916	34,332
Total $PM_{2.5}$	8.76	9.43	9.48	9.22	9.35	9.37	9.37	9.37	9.48
Total PM_{10}	46.65	50.20	50.49	49.10	49.79	49.87	49.87	49.87	50.49

Temporary portable concrete batch plants would be constructed and operated approximately every 25 miles along the ROW, mainly at construction staging areas. The total emissions for Alternative 3 is assumed to include four batch plants, which is equivalent to the Proposed Action. The emissions from the concrete batch plants have been included in Table 4.2-23. The maximum number of concrete batch plants by alternative and the total anticipated emissions from construction and operation of batch plants are provided in Table 4.2-24.

Table 4.2-23 Alternative 3 Total Project Emissions (tons) for Subalternatives 3G – 3M

POLLUTANT	PROPOSED ACTION	ALTERNATIVE 3	ALTERNATIVE 3 SUBALTERNATIVES						MAXIMUM
			3G	3H	3J	3K	3L	3M	
Total Miles	114.3	123.0	122.2	122.2	122.2	123.1	122.2	123.7	123.7
Fugitive Dust - Construction									
$PM_{2.5}$	3.89	4.19	4.16	4.16	4.16	4.19	4.16	4.21	4.21
PM_{10}	38.92	41.88	41.61	41.61	41.61	41.92	41.61	42.12	42.12
Fugitive Dust – Paved Road									
$PM_{2.5}$	0.87	0.94	0.93	0.93	0.93	0.94	0.93	0.94	0.94
PM_{10}	3.54	3.81	3.79	3.79	3.79	3.81	3.79	3.83	3.83
Commuting/Delivery/Off-road Exhaust/Batch Plant									
CO	35.10	37.77	37.53	37.53	37.53	37.80	37.53	37.77	37.77
NO_x	95.69	102.98	102.31	102.31	102.31	103.06	102.31	102.98	102.98
$PM_{2.5}$	4.00	4.51	4.48	4.48	4.48	4.51	4.48	4.51	4.51
PM_{10}	4.19	4.31	4.28	4.28	4.28	4.31	4.28	4.31	4.31
SO_2	0.21	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
VOC	8.39	9.03	8.97	8.97	8.97	9.04	8.97	9.03	9.03
CO_2e	31,723	34,138	33,916	33,916	33,916	34,165	33,916	34,138	34,138
Total $PM_{2.5}$	8.76	9.43	9.37	9.37	9.37	9.44	9.37	9.48	9.48
Total PM_{10}	46.65	50.20	49.87	49.87	49.87	50.24	49.87	50.49	50.49

Table 4.2-24 Alternative 3 Concrete Batch Plant Annual Emissions (tpy)

SCENARIO	MAXIMUM QUANTITY	CO	NO_X	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2E
Proposed Action	4	1.26	1.49	0.33	0.37	0.03	0.04	77.03
Alternative 3	4	1.36	1.62	0.35	0.40	0.03	0.05	83.36

As initially outlined in Section 4.2.4.1, ozone nonattainment emissions include a proportion of total off-road emissions, based on 6 miles of route in O_3 nonattainment versus 123.7 miles of the maximum length among Alternative 3 and all subalternative routes. Portions of commuting and material delivery emissions in NAAQS maintenance or nonattainment areas vary by pollutant, due to varying size of Phoenix nonattainment/maintenance are for each pollutant:

- Ozone: one-half of commuting and material delivery NOx and VOC emissions assumed to occur in the nonattainment area.

- PM_{10}: one-third of commuting and material delivery exhaust, and paved road PM_{10} emissions assumed in the nonattainment area.
- CO: one-fourth of commuting and material delivery CO emissions assumed in maintenance area.
- Chinook helicopter emissions were excluded because they are not being used in or around the Phoenix nonattainment/maintenance area.

As shown in Table 4.2-25, all variations of Alternative 3 are below the conformity levels as outlined by the Phoenix nonattainment/maintenance area.

Table 4.2-25 Alternative 3 Conformity Threshold Comparison

POLLUTANT	NAAQS STATUS	CLASSIFICATION	CONFORMITY DE MINIMIS (TON/YR)	PHOENIX NAA/MAIN. EMISSIONS (TON/YR)
Carbon Monoxide	Maintenance	Serious	100	3.42
Nitrous Oxides	O_3 Nonattainment	Moderate	100	14.17
Particulate Matter 10	Nonattainment	Serious	70	1.17
Volatile Organics	O_3 Nonattainment	Moderate	100	0.83

The California portion is approximately 19.3 miles in length, thus the total emissions were multiplied by 19.3/123.7 except for the batch plants. As stated earlier, each plant would be spaced approximately every 25 miles (one batch plant in California). Table 4.2-26 compares the estimated California emissions to the MDAQMD thresholds.

Table 4.2-26 California Construction Alternative 3/MDAQMD Comparison

POLLUTANT	ALTERNATIVE 3	SIGNIFICANCE THRESHOLD	ALTERNATIVE 3	SIGNIFICANCE THRESHOLD
	(TONS/YR)		(LB/HR)	
CO	4.44	100	71.52	548
NO_x	9.66	25	114.30	137
PM_{10}	5.89	15	51.64	82
$PM_{2.5}$	1.09	12	18.17	65
SO_x	0.03	25	1.16	137
VOC	0.98	25	7.92	137
CO_2e	3,668	100,000	20,025	548,000

The NO_x significance threshold would be exceeded in Imperial County, but that would only occur if all Riverside County emissions are assumed to travel into Imperial County. The distance between the Project and the county line is 15-20 km. To exceed the significance threshold, 87.5 percent of the emissions would have to reach Imperial County. Additionally, the estimates shown in Table

4.2-26 assume maximum operation of the batch plant and OHVs occurring simultaneously throughout the day. While theoretically possible, it is very unlikely to occur. Lastly, ICAPCD personnel were contacted and any potential ozone impacts that may occur from this Project would be addressed during the permitting process with MDAQMD. ICAPCD would be consulted as necessary which may include equipment lists and other pertinent information associated with the nonattainment area.

Both the emissions that occur in Riverside County, California and within the Phoenix nonattainment/maintenance area are well below applicable significance thresholds. Thus, the impacts associated with Alternative 3 are considered minor and in compliance with applicable NAAQS.

ADEQ provides Permitting Exemption Thresholds with their modeling guidance which indicates that the ambient air quality modeling is not necessary for those pollutants that are below those values on an annual basis. Table 4.2-27 outlines those thresholds and compares them to the Proposed Project emissions. Note that the emissions shown below are those that would occur within the borders of Arizona of the remaining 104.4 miles (19.3 miles within California). Note that three of the four batch plants would be assumed to operate within Arizona and the EPA GHG reporting threshold was used for CO_2e significance comparisons.

Table 4.2-27 Arizona Construction Alternative 3/ADEQ Threshold Comparison

POLLUTANT	ALTERNATIVE 3	SIGNIFICANCE THRESHOLD
	(TONS/YR)	
CO	23.95	50
NO_x	65.44	20
PM_{10}	31.95	7.5
$PM_{2.5}$	6.00	5
SO_2	0.14	20
VOC	5.75	20
CO_2e	21,7260	25,000

Table 4.2-28 compares the screening level maximum short-term (e.g., 1-hour and 24-hour) pollutant concentrations from construction activities for Alternative 3 to the respective SIL.

Table 4.2-28 Alternative 3 SIL Comparison

POLLUTANT	AVERAGING PERIOD	MAX 1-HR AERSCREEN (μG/M³)*	SIL (μG/M³)	OVER THE SIL?
NO_2	1-hour	74.0	7.5	Yes
$PM_{2.5}$	1-hour	4.1	1.2	Yes
PM_{10}	24-hour	17.2	5	Yes

Note: μg/m³= micrograms per cubic meter. *Maximum AERSCREEN concentrations obtained from comparable and larger transmission line/substation construction projects (BLM 2013a, 2013b).

Based upon the values derived from the Sun Zia EIS, Route 3 modeling results as described above, emissions for Alternative 3 would generate 31.95 tons/yr of PM_{10} (6.00 tpy $PM_{2.5}$), while the Sun Zia single line for Route 3 was 143.7 tons/yr (15.4 tpy $PM_{2.5}$). Thus, the 77.4 μg/m³ (10.6 μg/m³ $PM_{2.5}$) resulted in 17.2 μg/m³ (4.1 μg/m³ $PM_{2.5}$) for Alternative 3. Similarly, 19.9 tons/yr NO_2 resulted in 22.5 μg/m³. Alternative 3 emissions would be 65.44 tons/yr or 74.0 μg/m³.

Table 4.2-29 presents a comparison of the expected maximum short-term AERSCREEN concentrations from construction activities, representative background concentrations of NO_2 and PM_{10}, and the applicable ambient air quality standards. As shown, Alternative 3 would not exceed the NAAQS.

Table 4.2-29 Alternative 3 NAAQS Impact

POLLUTANT	AVERAGING PERIOD	MAX 1-HR AERSCREEN (μG/M³)*	BACKGROUND (μG/M³)*	TOTAL (μG/M³)	NAAQS (μG/M³)
NO_2	1-hour	74.0	10.34	84.3	188
$PM_{2.5}$	1-hour	4.1	7.5	11.6	35
PM_{10}	24-hour	17.2	72.5	89.7	150

* Background values are derived as a three-year average between 2013-2015 at the Wenden, AZ met site. Parts per billion from the monitors was converted to μg/m³ by multiplying the ppb value by 1.88 for NO_2.

<u>Summary</u>

Air Quality

Alternative 3 would not have an adverse impact to air quality for the following reasons:

Emissions of criteria air pollutants would not exceed the conformity emissions thresholds for the Phoenix NAA/Maintenance area. The criteria pollutant emissions would not exceed the daily and annual MDAQMD significance thresholds for the Riverside corridor of Alternative 3.

As stated previously, ADEQ provides Permitting Exemption Thresholds with their modeling guidance which indicates that the ambient air quality modeling is not necessary for those pollutants that are below those values on an annual basis. CO, SO_2, and VOC would not exceed the ADEQ Permitting Exemption thresholds, indicating that those emissions would not exceed the NAAQS.

NO_x, $PM_{2.5}$, and PM_{10} emissions for Alternative 3 would exceed the ADEQ Permitting Exemption Thresholds, but further analysis indicates that the maximum short-term AERSCREEN concentrations from Alternative 3 construction activities, plus representative background concentrations of NO_2 and PM_{10}, would not exceed the applicable ambient air quality standards.

The MDAQMD recommends that ambient air quality modeling be conducted when project emissions exceed their significance thresholds (Table 4.2-4). If the emissions from Alternative 3 would not exceed the thresholds it is assumed that there would not be a violation of the CAAQS.

Climate Change
Alternative 3 would not have an adverse impact to climate change for the following reasons:

Alternative 3 construction GHG emissions would be less than the 25,000 MTCO2e reporting thresholds and would be temporary in nature. Operational emissions would be long term, but they would be substantially below the 25,000 $MTCO_2e$ reporting thresholds. To the extent Alternative 3 would allow for the displacement of fossil fuel energy generation with renewable energy sources there would be a beneficial contribution to anthropogenic climate change.

Subalternatives to Alternative 3 (3A through 3M)

Subalternatives to Alternative 3 would result in similar emissions estimates, therefore, there would be no adverse impacts to air quality and climate change.

4.2.4.5 Alternative 4 – Public Lands Emphasis Route

Tables 4.2-30 and 4.2-31 presents the estimated total air emissions from construction activities for Alternative 4. Estimated emissions from proposed construction of various subalternatives are presented for comparative purposes. For specifics regarding segments and replacement per zone refer to Sections 2.4.7.1 through 2.4.7.4 and Tables 2.4-21 through 2.4-23. Each subalternative length listed in the table is the difference between the replacing segments and the segments being replaced within Alternative 4.

Table 4.2-30 Alternative 4 Annual Emissions (tpy) for Subalternatives 4A – 4G

POLLUTANT	PROPOSED ACTION	ALTER-NATIVE 4	ALTERNATIVE 4 SUBALTERNATIVES							MAXI-MUM
			4A	4B	4C*	4D	4E	4F	4G	
Total Miles	114.3	120.3	125.9	124.8	120.9	120.9	121.7	120.9	122.5	125.9
Fugitive Dust - Construction										
$PM_{2.5}$	3.89	4.10	4.29	4.25	4.12	4.12	4.14	4.12	4.17	4.29
PM_{10}	38.92	40.96	42.87	42.50	41.17	41.17	41.44	41.17	41.71	42.87
Fugitive Dust – Paved Road										
$PM_{2.5}$	0.87	0.91	0.96	0.95	0.92	0.92	0.93	0.92	0.93	0.96
PM_{10}	3.54	3.73	3.90	3.87	3.75	3.75	3.77	3.75	3.79	3.90

POLLUTANT	PROPOSED ACTION	ALTER-NATIVE 4	ALTERNATIVE 4 SUBALTERNATIVES							MAXI-MUM
Commuting/Delivery/Off-road Exhaust/Batch Plant										
CO	35.10	36.94	38.66	38.32	37.13	37.13	37.37	37.13	37.62	38.66
NO_x	95.69	100.71	105.40	104.48	101.22	101.22	101.89	101.22	102.56	105.40
$PM_{2.5}$	4.00	4.41	4.61	4.57	4.43	4.43	4.46	4.43	4.49	4.61
PM_{10}	4.19	4.21	4.41	4.37	4.23	4.23	4.26	4.23	4.29	4.41
SO_2	0.21	0.22	0.24	0.23	0.23	0.23	0.23	0.23	0.23	0.24
VOC	8.39	8.83	9.25	9.16	8.88	8.88	8.94	8.88	9.00	9.25
CO_2e	31,723	33,388	34,943	34,637	33,555	33,555	33,777	33,555	33,999	34,943
Total $PM_{2.5}$	8.76	9.22	9.65	9.57	9.27	9.27	9.33	9.27	9.39	9.65
Total PM_{10}	46.65	49.10	51.38	50.94	49.34	49.34	49.67	49.34	50.00	51.38

* The worst-case emissions were selected for Subalternative 4C, which is the combination of 4D (Segment i-04) and 4D (Segments x-05 and p-07) rather than in combination with 4J (Segment i-05). The overall difference is approximately 0.4 miles longer. Note that if Subalternative 4D is used; 4C must be applied as well. Thus, it is assumed that they have equivalent emissions.

Table 4.2-31 Alternative 4 Total Project Emissions (tons) for Subalternatives 4H – 4P

POLLUTANT	PROPOSED	ALTER-NATIVE 4	ALTERNATIVE 4 SUBALTERNATIVES							MAXI-MUM
			4H	4J	4K	4L	4M	4N	4P	
Total Miles	114.3	120.3	119.7	120.6	119.7	121.1	121.1	122.2	119.6	122.2
Fugitive Dust - Construction										
$PM_{2.5}$	3.89	4.10	4.08	4.11	4.08	4.12	4.12	4.16	4.07	4.16
PM_{10}	38.92	40.96	40.76	41.07	40.76	41.24	41.24	41.61	40.73	41.61
Fugitive Dust – Paved Road										
$PM_{2.5}$	0.87	0.91	0.91	0.92	0.91	0.92	0.92	0.93	0.91	0.93
PM_{10}	3.54	3.73	3.71	3.74	3.71	3.75	3.75	3.79	3.70	3.79
Commuting/Delivery/Off-road Exhaust/Batch Plant										
CO	35.10	36.94	36.76	37.03	36.76	37.19	37.19	37.53	36.73	37.53
NO_x	95.69	100.71	100.21	100.97	100.21	101.38	101.38	102.31	100.13	102.31
$PM_{2.5}$	4.00	4.41	4.39	4.42	4.39	4.44	4.44	4.48	4.38	4.48
PM_{10}	4.19	4.21	4.19	4.22	4.19	4.24	4.24	4.28	4.19	4.28
SO_2	0.21	0.22	0.22	0.23	0.22	0.23	0.23	0.23	0.22	0.23

POLLUTANT	PROPOSED	ALTER-NATIVE 4	ALTERNATIVE 4 SUBALTERNATIVES							MAXI-MUM
VOC	8.39	8.83	8.79	8.86	8.79	8.89	8.89	8.97	8.78	8.97
CO_2e	31,723	33,388	33,222	33,472	33,222	33,610	33,610	33,916	33,194	33,916
Total $PM_{2.5}$	8.76	9.22	9.18	9.25	9.18	9.28	9.28	9.37	9.17	9.37
Total PM_{10}	46.65	49.10	48.85	49.22	48.85	49.43	49.43	49.87	48.81	49.87

Temporary portable concrete batch plants would be constructed and operated approximately every 25 miles along the ROW, mainly at construction staging areas. The maximum number of concrete batch plants by alternative and the total anticipated emissions from construction and operation of batch plants are provided in Table 4.2-32. The total emissions for Alternative 4 is assumed to include four batch plants, which is equivalent to the Proposed Action. The emissions from the concrete batch plants have been included in Table 4.2-31 above.

Table 4.2-32 Alternative 4 Concrete Batch Plant Annual Emissions (tpy)

SCENARIO	MAXIMUM QUANTITY	CO	NO_X	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2E
Proposed Action	4	1.26	1.49	0.33	0.37	0.03	0.04	77.03
Alternative 4	4	1.38	1.65	0.36	0.41	0.03	0.05	84.84

As initially outlined in Section 4.2.4.1, ozone nonattainment emissions include a proportion of total off-road emissions, based on 6 miles of route in O_3 nonattainment versus 125.9 miles of the maximum length among Alternative 4 and all subalternative routes. Portions of commuting and material delivery emissions in NAAQS maintenance or nonattainment areas vary by pollutant, due to varying size of Phoenix nonattainment/maintenance are for each pollutant:

- Ozone: one-half of commuting and material delivery NOx and VOC emissions assumed to occur in the nonattainment area.
- PM_{10}: one-third of commuting and material delivery exhaust, and paved road PM_{10} emissions assumed in the nonattainment area.
- CO: one-fourth of commuting and material delivery CO emissions assumed in maintenance area.
- Chinook helicopter emissions were excluded because they are not being used in or around the Phoenix nonattainment/maintenance area.

As shown in Table 4.2-33, all variations of the Alternative 4 are below the conformity levels as outlined by the Phoenix nonattainment/maintenance area.

Table 4.2-33 Alternative 4 Conformity Threshold Comparison

POLLUTANT	NAAQS STATUS	CLASSIFICATION	CONFORMITY DE MINIMIS (TON/YR)	PHOENIX NAA/MAIN. EMISSIONS (TON/YR)
Carbon Monoxide	Maintenance	Serious	100	3.48
Nitrous Oxides	O_3 Nonattainment	Moderate	100	14.43
Particulate Matter 10	Nonattainment	Serious	70	1.20
Volatile Organics	O_3 Nonattainment	Moderate	100	0.84

The California portion is approximately 19.1 miles in length; thus the total Project emissions were multiplied by 19.1/125.9 except for the batch plants. As stated earlier, each plant would be spaced approximately every 25 miles (one batch plant in California). Table 4.2-34 compares the estimated California emissions to the MDAQMD thresholds.

Table 4.2-34 California Construction Alternative 4/MDAQMD Comparison

POLLUTANT	ALTERNATIVE 4	SIGNIFICANCE THRESHOLD	ALTERNATIVE 4	SIGNIFICANCE THRESHOLD
	(TONS/YR)		(LB/HR)	
CO	4.40	100	71.24	548
NO_x	9.61	25	113.95	137
PM_{10}	5.83	15	51.25	82
$PM_{2.5}$	1.08	12	18.10	65
SOx	0.03	25	1.16	137
VOC	0.97	25	7.87	137
CO2e	3,636	100,000	26,814	548,000

The NO_x significance threshold would be exceeded in Imperial County, but that only occurs if all Riverside County emissions are assumed to travel into Imperial County. The distance between the Project and the county line is 15-20 km. To exceed the significance threshold, 87.8 percent of the emissions would have to reach Imperial County. Additionally, the estimates shown in Table 4.2-34 assume maximum operation of the batch plant and OHVs occurring simultaneously throughout the day. While theoretically possible, it is very unlikely to occur. Lastly, ICAPCD personnel were contacted and any potential ozone impacts that may occur from this Project would be addressed during the permitting process with MDAQMD. ICAPCD would be consulted as necessary which may include equipment lists and other pertinent information associated with the nonattainment area.

Both the emissions that would occur in Riverside County, California and within the Phoenix nonattainment/maintenance area would be well below applicable significance thresholds. Thus, the impacts associated with Alternative 4 are considered minor and in compliance with applicable NAAQS.

ADEQ provides Permitting Exemption Thresholds with their modeling guidance which indicates that the ambient air quality modeling is not necessary for those pollutants that are below those values on an annual basis. Table 4.2-35 outlines those thresholds and compares them to the Proposed Project emissions. Note that the emissions shown below are those that would occur within the borders of Arizona of the remaining 106.8 miles (19.1 miles within California). Note that three of the four batch plants would be assumed to operate within Arizona and the EPA GHG reporting threshold was used for CO_2e significance comparisons.

Table 4.2-35 Arizona Construction Alternative 4/ADEQ Threshold Comparison

POLLUTANT	ALTERNATIVE 4	SIGNIFICANCE THRESHOLD
	(TONS/YR)	
CO	24.50	50
NO_x	66.94	20
PM_{10}	32.68	7.5
$PM_{2.5}$	6.13	5
SO_2	0.15	20
VOC	5.88	20
CO_2e	22,225	25,000

Table 4.2-36 compares the screening level maximum short-term (e.g., 1-hour and 24-hour) pollutant concentrations from transmission line and substation construction to the respective SIL.

Table 4.2-36 Alternative 4 SIL Comparison

POLLUTANT	AVERAGING PERIOD	MAX 1-HR AERSCREEN (µG/M³)*	SIL (µG/M³)	OVER THE SIL?
NO_2	1-hour	75.7	7.5	Yes
$PM_{2.5}$	1-hour	4.2	1.2	Yes
PM_{10}	24-hour	17.6	5	Yes

Note: $\mu g/m^3$= micrograms per cubic meter. *Maximum AERSCREEN concentrations obtained from comparable and larger transmission line/substation construction projects (BLM 2013a, 2013b).

Based upon the values derived from the Sun Zia EIS, Route 3 modeling results as described above, emissions for Alternative 4 would generate 32.68 tons/yr of PM_{10} (6.13 tpy $PM_{2.5}$), while the Sun Zia single line for Route 3 was 143.7 tons/yr (15.4 tpy $PM_{2.5}$). Thus the 77.4 $\mu g/m^3$ (10.6 $\mu g/m^3$

$PM_{2.5}$) resulted in 17.6 µg/m^3 (4.2 µg/m^3 $PM_{2.5}$) for Alternative 4. Similarly, 19.9 tons/yr NO_2 resulted in 22.5 µg/m^3. Alternative 4 emissions would be 66.94 tons/yr or 75.7 µg/m^3.

Table 4.2-37 presents a comparison of the expected maximum short-term AERSCREEN concentrations from construction activities, representative background concentrations of NO_2 and PM_{10}, and the applicable ambient air quality standards. As shown, Alternative 4 would not exceed the NAAQS.

Table 4.2-37 Alternative 4 NAAQS Impact

POLLUTANT	AVERAGING PERIOD	MAX 1-HR AERSCREEN (µG/M^3)*	BACKGROUND (µG/M^3)*	TOTAL (µG/M^3)	NAAQS (µG/M^3)
NO_2	1-hour	75.7	10.34	86.0	188
$PM_{2.5}$	1-hour	4.2	7.5	11.7	35
PM_{10}	24-hour	17.6	72.5	90.1	150

* Background values are derived as a three-year average between 2013-2015 at the Wenden, AZ met site. Parts per billion from the monitors was converted to µg/m^3 by multiplying the ppb value by 1.88 for NO_2.

Summary

Air Quality

Alternative 4 would not have an adverse impact to air quality for the following reasons:

Emissions of criteria air pollutants would not exceed the conformity emissions thresholds for the Phoenix NAA/Maintenance area. The criteria pollutant emissions would not exceed the daily and annual MDAQMD significance thresholds for the Riverside corridor of Alternative 4.

As stated previously, ADEQ provides Permitting Exemption Thresholds with their modeling guidance which indicates that the ambient air quality modeling is not necessary for those pollutants that are below those values on an annual basis. CO, SO_2, and VOC would not exceed the ADEQ Permitting Exemption thresholds, indicating that those emissions would not exceed the NAAQS.

NO_x, $PM_{2.5}$, and PM_{10} emissions for Alternative 4 would exceed the ADEQ Permitting Exemption Thresholds, but further analysis indicates that the maximum short-term AERSCREEN concentrations from Alternative 4 construction activities, plus representative background concentrations of NO_2 and PM_{10}, would not exceed the applicable ambient air quality standards.

The MDAQMD recommends that ambient air quality modeling be conducted when project emissions exceed their significance thresholds (Table 4.2-4). If the emissions from Alternative 4 would not exceed the thresholds it is assumed that there would not be a violation of the CAAQS.

Climate Change

Alternative 4 would not have an adverse impact to climate change for the following reasons:

Alternative 4 construction GHG emissions would be less than the 25,000 $MTCO_2e$ reporting thresholds and would be temporary in nature. Operational emissions would be long term, but they would be substantially below the 25,000 $MTCO_2e$ reporting thresholds. To the extent Alternative

4 would allow for the displacement of fossil fuel energy generation with renewable energy sources there would be a beneficial contribution to anthropogenic climate change.

<u>Subalternatives to Alternative 4 (4A through 4P)</u>

Subalternatives to Alternative 4 would result in similar emissions estimates, therefore, there would be no adverse impacts to air quality and climate change.

4.2.5 Operations, Maintenance, and Decommissioning

Operational emissions and impacts would be much lower than construction phase emissions and impacts, thus, they have not been quantified (except for potential SF_6 emissions from the circuit breakers). Operation and maintenance emissions would include vehicle exhaust from travel to/from the substations, the transmission line, and ancillary facilities for routine inspection, as well as potential SF_6 emissions from operation of the gas-insulated circuit breakers in the switchyards. Operational emissions would be much lower than construction emissions due to the limited amount of vehicle traffic and lack of construction equipment which are the primary emission contributors.

An additional source of air emissions would be the ozone generated from the operation of the line; however, transmission lines do not generally represent a significant source of ozone emissions and therefore ozone emissions from line operation would be expected to be minimal. Emissions from vehicle travel during operation and maintenance would be minimal, and mileage for vehicle travel to substations and the transmission line for routine inspection would be much less than during construction. Emissions from vehicle exhaust during operation and maintenance would therefore be less than those from construction and also from decommissioning activities in the future.

Table 4.2-38 presents the potential SF_6 emissions from circuit breaker leakage from each substation during operation and maintenance. As shown in the table, these operation emissions would be minimal and are below the GHG reporting thresholds reported above. Therefore, impacts to air quality resources would be minor (i.e., impacts would occur, but air quality would not be impacted) but long-term (i.e., greater than 5 years in duration). Additionally, the replacement of older substation equipment with newer equipment would potentially result in reduced SF_6 emissions. Operational GHG emissions from substations would occur regardless of the Action Alternative chosen. Note that the leakage rate of SF_6 is assumed to be 0.5 percent with a GWP of 22,800.

Table 4.2-38 Estimated SF_6 Emissions from Substation Leakage

SUBSTATION	# OF BREAKERS	LB PER BREAKER	TOTAL POUNDS	METRIC TONS CO_2E PER YEAR
Delaney Substation	6	1209	7,254	375.1
Colorado River Substation	6	1209	7,254	375.1
Series Compensation Substation	3	51	153	7.9
Total			14,661	758.1
GHG Reporting Threshold				25,000
Exceeds Threshold?				No

4.2.6 Mitigation Measures

No MMs are required for any of the alternatives or subalternatives. The applicant has committed to APMs, and the BLM developed required BMPs that would further reduce air quality impacts. Notably, APM-AQ-01 would control 61 percent of fugitive dust emissions per CalEEMod by watering three times per day. In addition, APM-AQ-02 would be implemented to minimize engine idling time, both to decrease energy use and costs, and to help minimize air pollutant emissions.

4.2.7 Residual Impacts

The Proposed Action and each of the Alternatives and subalternatives would not require any additional APMs, BMPs, or MMs; any residual impacts to air quality and climate change from the Proposed Action or any of the Alternatives or subalternatives would be minor and short-term.

4.2.8 CDCA Plan Compliance

CMAs LUPA-AIR-1 through LUPA-AIR-3, LUPA-AIR-5, LUPA-BIO-6, and LUPA-BIO-13 would apply to the Project (Appendix 2C). The Project would comply with these CMAs through APM-AQ-01 and APM-AQ-02 and BMP-AQ-01, BMP-AQ-02, and BMP-AQ-05 (Appendix 2A). Further, the Project would not be a major stationary source of air quality or visibility deterioration (LUPA-AIR-1) (Appendix 2C).

4.2.9 Unavoidable Adverse Effects

The Project would result in some increase to ambient pollutant concentrations. Since adverse impacts to air quality from Project emissions would dissipate with time, there would be no long-term air quality impacts from Project criteria and HAP emissions.

4.2.10 Cumulative Effects

4.2.10.1 Air Quality

Regional air quality is good within most of the Project airshed within attainment areas. The exception is approximately 6 miles on the far eastern edge within the Phoenix Metropolitan Nonattainment ozone area and part of northeastern Imperial County. The 2014 EPA National Emission Inventory (NEI; EPA 2014b) was used to established existing emissions. There are currently four known potential future projects that may come to fruition within the air quality study area (Table 3.20-6). These include: the Fancher-Luxor Mine, the Plomosa 9 Placer Claim Mine, the West Port Gold mine, and the AltaGas Sonoran Energy Project. It is unknown if any of these projects will begin, but all will produce some level of air quality emissions. Total potential emissions are unknown at this time, but the cumulative totals would increase in La Paz, Maricopa, and Yuma Counties. While the cumulative totals have the potential to increase, the overall impact the Project alternatives may have in the future would decrease on a percentage basis. To ensure maximum conservatism, the cumulative effects table discussed and illustrated below (Table 4.2-39) includes only existing emissions as well as emissions from the Project.

Few large, stationary emissions sources are present in or near the study area. The largest emissions sources in the study area are several natural gas–fired combustion turbine electric generating plants near the eastern end of the Project (i.e., Harquahala Power Plant, Arlington Valley Energy Facility, Mesquite Generating Station Block 2, and Red Hawk), the Palo Verde nuclear generating station also on the eastern end, and the Blythe Energy Center on the west end of the Project. These plants and facilities generally have reported about 100 to 200 tons per year per facility of NO_x emissions in 2014 and lesser amounts of other pollutants. These stationary emissions are dwarfed by the emissions from mobile sources in the Phoenix metropolitan area and Riverside County, which make up most those counties' NO_x and CO emissions.

Table 4.2-39 Proposed Action Cumulative Emissions

ACTIVITY	PM_{10} (TPY)	$PM_{2.5}$ (TPY)	NO_X (TPY)	CO (TPY)	VOC (TPY)	SO_2 (TPY)
Proposed Action	35.0	6.6	71.8	26.3	6.3	0.2
Maricopa County	98,106	20,052	63,023	449,787	269,005	1,111
La Paz County	6,104	1,154	3,765	35,350	115,111	16
Riverside County	18,812	5,324	30,969	136,625	154,570	467
Blythe Area*	16.2	16.2	446.8	173.4	33.2	3.2
Cumulative Total	123,073	26,553	98,276	621,962	538,725	1,597
Contributed by Proposed Action	0.028%	0.025%	0.073%	0.004%	0.001%	0.001%

* The Blythe Area represents Southern California Gas and the Blythe Energy Project for 2015 Riverside County. https://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php.

Under the Proposed Action, the criteria pollutant emissions generated by construction, the batch plants, commuting traffic, and fugitive dust contribute a negligible amount, ranging from 0.001 percent to 0.073 percent, to the cumulative criteria pollutant emissions within the analysis area. Additionally, the Project emissions would not exceed the Federal conformity determination thresholds, which have been established to demonstrate there will be no increase in emission in the nonattainment or maintenance area from the Federal action that could cause new violations of the standards and/or no increase in the frequency or severity of previous violations.

Each of the four full route alternatives, as discussed above contribute similar emissions when compared to the Proposed Action. Table 4.2-40 provides the maximum criteria pollutant emissions among each of the four full route alternatives.

Table 4.2-40 Alternative Action Cumulative Emissions

ACTIVITY	PM_{10} (TPY)	$PM_{2.5}$ (TPY)	NO_X (TPY)	CO (TPY)	VOC (TPY)	SO_2 (TPY)
Alternative 1	35.8	6.7	73.5	27.0	6.4	0.2
Alternative 2	39.4	7.4	80.9	29.7	7.1	0.2
Alternative 3	37.9	7.1	77.7	28.5	6.8	0.2
Alternative 4	38.5	7.2	79.1	29.0	6.9	0.2
Maricopa County	98,106	20,052	63,023	449,787	269,005	1,111
La Paz County	6,104	1,154	3,765	35,350	115,111	16
Riverside County	18,812	5,324	30,969	136,625	154,570	467

ACTIVITY	PM_{10} (TPY)	$PM_{2.5}$ (TPY)	NO_X (TPY)	CO (TPY)	VOC (TPY)	SO_2 (TPY)
Blythe Area*	16.2	16.2	446.8	173.4	33.2	3.2
Maximum Cumulative Total	123,061	26,537	97,838	621,792	538,693	1,594
Contributed by Proposed Action	0.032%	0.028%	0.083%	0.005%	0.001%	0.011%

* The Blythe Area represents Southern California Gas and the Blythe Energy Project for 2015 Riverside County. https://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php.

In a similar fashion to the Proposed Action, the maximum alternative, Alternative 2, would contribute a negligible amount ranging from 0.001 percent to 0.083 percent when compared to the cumulative criteria pollutant totals. Additionally, each of the full route alternative emissions would not exceed the Federal conformity determination thresholds, which have been established to demonstrate there will be no increase in emission in the nonattainment or maintenance area from the Federal action that could cause new violations of the standards and/or no increase in the frequency or severity of previous violations.

4.2.10.2 Greenhouse Gas Emissions and Impacts

Climate change by nature is a cumulative process to which sources contribute GHGs from around the globe. The discussion of the Proposed Action and full route Alternative emissions relative to the current regional and global GHG emissions rates are discussed in Chapter 3. Total GHG emissions provided in Chapter 3 are 43.4 billion metric tons of CO_2e per year; Arizona 92.3 million metric tons and California 441.5 million metric tons. The Blythe area generated 384,916 metric tons of CO_2e in 2016 (ARB 2016).

The overwhelming majority of GHG emissions associated with the Proposed Action or full route Alternatives are derived from vehicle traffic, either off-road, commuting or delivery. The values detailed in Table 4.2-41 represent the total GHG emissions under the Proposed Action and each full route alternative for a given 12-month timeframe.

Table 4.2-41 Proposed Action and Action Alternative GHG Cumulative Emissions

GHG SOURCE	MAXMIMUM $MTCO_2E$
Proposed Action	21,584
Alternative 1	22,113
Alternative 2	24,322
Alternative 3	23,359
Alternative 4	23,775

Table 4.2-41 shows that GHG emissions under either the Proposed Action or full route Alternatives would contribute negligibly to total global and regional cumulative GHG emissions from all sources, as well as to the cumulative impact on climate change, because of their comparative small amounts and the short duration of their contribution under the construction period. Notably the

GHG emissions would be well below the 25,000 mandatory reporting thresholds established by the EPA.

As noted in Section 3.20.4.1, there are potential infrastructure issues that could arise due to climate change. Increased wildfires can damage transmission structures, not only directly but indirectly from heat, smoke, and particulate matter that accumulates on the insulators and conductors which can cause outages and/or arcing (Sathaye et al. 2013). To ensure that the transmission lines resist wildfire and other extreme storm impacts better, common hardening practices include utilizing structures made of steel, concrete, or a composite material; upgrading transmission structures from aluminum to galvanized-steel lattice or concrete and installing guy wires and other structural supports. Proactive adaptation to a changing climate includes proper transmission line siting and new technology deployment.

4.2.11 Irreversible and Irretrievable Commitment of Resources

As the Project would eventually be decommissioned, air quality would then be the same as the No Action Alternative and therefore the Project would not result in an irretrievable commitment to air resources. There may be an irreversible commitment of local ambient air quality if the transmission line enables the transmission of electricity generated from fossil fuels. However, an increase in the availability of renewable energy would presumably displace emissions from the generation of electricity from fossil fuels, and the transmission of electricity generated from renewable energy would potentially result in lowered air pollutant emissions and not result in an irreversible commitment to local ambient air quality.

GHG emissions from the Project (including potential SF_6 leaks from circuit breakers) would result in a minor (relative to local, national, and/or global GHG emissions) but irreversible and irretrievable increase in GHGs. Depending on the increase in availability of renewable energy made possible due to the Project, an increase or decrease in the amount of GHGs from the generation of fossil fuels would occur.

4.2.12 Relationship of Short-term Uses and Long-term Productivity

The Project would cause some short-term, minor deterioration in existing air quality during the construction of the transmission line, SCS, and ancillary facilities. Long-term impacts would be negligible because operation and maintenance of the Project would not emit pollutants into the atmosphere in quantities that would exceed air pollution standards. Therefore, no effects on the maintenance and enhancement of long-term productivity related to air quality would occur because of the implementation of the Project. Additionally, one of the intended goals of the Project is to encourage the development of renewable energy generation projects, possibly lowering net GHG emissions in the long-term.

4.3 GEOLOGY, MINERALS, AND SOIL RESOURCES

4.3.1 Introduction

Impacts to geology and minerals are discussed in terms of whether the Project and alternatives would result in significant effects on geology and minerals by analyzing the context and intensity of the change that would be introduced by the Project, in accordance with CEQ regulations at 1508.27. Impacts to soil resources are discussed in terms of acreage impacted and percent of disturbance.

4.3.2 Methods for Analysis

4.3.2.1 Analysis Area

The analysis area for geology, minerals, and soils resources is the 200-foot ROW for all of the Action Alternatives plus ancillary Project components resulting in new surface disturbance located outside the ROW.

4.3.2.2 Assumptions

Geology and Minerals

The following factors were assumed when evaluating the effects of the Project on geology and mineral resources:

- A geotechnical engineering study would be completed prior to final design and construction of the Project to identify site-specific geological conditions and potential geological hazards. The data collected from the study would be used to guide sound engineering practices, and foundation design would be consistent with geological conditions for each structure site.
- Existing fault lines, land subsidence areas, earth fissures, mining claims, oil/gas reserves, areas of mineral resources of economic value, and other pertinent geological and mineral-related features have been accurately mapped.
- Operation and maintenance of the Project, as it relates to geological and mineral resources, would primarily be the presence of transmission structures and transmission lines and how they could preclude access to subsurface resources in the immediate vicinity.
- Transmission lines typically have little impact to mining operations. Span lengths are such that access to minerals can be accomplished between spans. Should open pit mining be planned, structures can be left on 'islands,' or the mining interests can have the transmission line locally re-routed (personal communication, Mark Wieringa, Western, 2013).

Additionally, the analysis assumes that all design features, APMs, and BMPs would be implemented.

Soils

Use of the NRCS STATSGO data (NRCS 2009), and SSURGO data where available, assumes mapped soil conditions are representative of actual conditions in the field (see Section 3.3.3.5 for a more detailed explanation). As with any mapped data, there is a certain amount of uncertainty related to the accuracy and scale of mapping; therefore, the actual soil conditions could vary substantially from those described at any particular location. The data used represent the best available information for evaluating soil resources. The inherent limitations of soil survey data are resolved with site-specific soil investigations within the actual Project footprint that are part of the permitting and construction design process.

4.3.2.3 Environmental Effect Indicators, Magnitude, and Duration

Geology and Minerals

The following indicators were considered when analyzing the effects on geology and mineral resources:

- Types of geological hazards and the potential of the Project to aggravate existing hazards;
- Types of geological hazards and their potential for affecting the Project;
- The potential for the Project to negatively affect important geological resources, including important state-identified rock outcroppings and potential geothermal areas; and
- The potential for the Project to negatively affect access to important mineral and petroleum resources.

While many of the potential impacts are difficult to quantify, "units of change" for the items above are based on the number of claims, leases, oil/gas wells, geological features, and locatable, leasable, and/or saleable mineral areas within the ROW. Measured impacts are followed by a determination regarding whether or not they are likely to be lost or occluded, and quantification of impacts when possible.

Soil Resources

The following impact indicators were considered when analyzing potential impacts to soil resources:

- loss of topsoil due to construction, operation, maintenance, and decommissioning activities (i.e., removal or mixing of topsoil)
- loss of soil productivity;
- soil compaction from vehicular traffic;
- soil erosion due to water and wind; and
- loss of active sand dune habitat.

In order to determine impacts to soil resources from wind erosion, the following variable was analyzed using the STATSGO database (Table 3.3-6 and Appendix 3A, Table 3A-4) and the SSURGO database (Appendix 3A, Table 3A-1):

Wind Erodibility Group (WEG)
The WEG index groups soils that have similar properties affecting their resistance to wind erosion. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible.

Tables and figures showing the SSURGO data available within the soils study area are in Appendix 3A.

Impacts to geology, minerals, and soil resources may be negligible, minor, moderate, or major, and may have durations that are qualified as temporary, short term, or long term (Table 4.1-1, Section 4.1.2).

4.3.3 No Action Alternative

Under the No Action Alternative, no ROW would be granted for the Project and the transmission line, SCS, and ancillary facilities would not be constructed. Undisturbed areas and existing geology and mineral resources would remain undisturbed unless they are mined in unrelated actions. Access to subsurface resources would not be inhibited within the Project ROW. Geological activity such as fault creep, earthquakes, landslides, and land subsidence and earth fissures would continue to occur.

Under the No Action Alternative, there would no direct or indirect impacts to soil resources from the Project.

4.3.4 Construction of Action Alternative Segments

4.3.4.1 Direct and Indirect Effects Common to All Action Alternatives

All Action Alternatives would involve drilling, blasting, excavation, etc., during construction. The potential impacts from construction include:

- areas of geological importance lost or made inaccessible for future use (direct);
- adversely affected important state-identified rock outcroppings (direct);
- known mineral resources of economic value or mining claims lost or made inaccessible (direct);
- affecting a valid existing mineral right by preclusion of access (direct);
- affecting oil or gas well fields, reserves, or otherwise affecting valid existing petroleum rights by preclusion of access (direct); and,
- creation or exacerbation of geological hazards, particularly increases in the probability or magnitude of mass wasting events or hazards due to slope instability (indirect).

<u>Geology</u>

Earthquakes
The seismic hazard ranges from a relatively low risk of 6 to 8 percent g (the acceleration due to gravity) at the Delaney Substation in Maricopa County, Arizona, to a moderate risk of 16 to 18

percent g at the Colorado River Substation in Riverside County, California (Section 3.3.3.1). Because Project activities would have no means of influencing seismicity, the frequency and magnitude of earthquakes would not be directly or indirectly impacted from construction of any Action Alternative. Further, Project engineering would consider seismic hazard in design; potential impacts to the Project from earthquakes would be negligible and long-term.

Faults

As discussed in Section 3.3.3.2, no active faults have been mapped within the ROW or broader study area for any of the alternatives.

Liquefaction

Site-specific geotechnical tests would be required to determine the specific liquefaction potential at a given location. Liquefaction is discussed further in the zones discussions (Sections 4.3.4.2 through 4.3.4.5).

Landslides

As discussed in Section 3.3.3.4, the relative risk for landslides in the analysis area is low with less than a 1.5 percent incidence. Locally there may be potential for slope movement in areas of steep topography (Table 3.3-2) depending on site-specific conditions. The Project would be designed to avoid steep slopes where possible, and a preconstruction geotechnical study would identify areas that need engineered solutions to mitigate for the potential for landslide/mass wasting events. Therefore, the potential for landslides would not likely be changed by construction and direct or indirect effects to the potential for landslides would not be anticipated. Impacts related to landslides would be short-term and negligible.

Land Subsidence

Most cases of land subsidence in the Southwest are caused by excessive groundwater pumping. This type of subsidence occurs very slowly over decades (AZGS 2007); subsidence is generally not a concern and there are no known subsidence areas within the study area. Therefore, land subsidence would not have direct or indirect effects on the construction of any Action Alternative.

Minerals

Mining

Direct impacts to mining districts during construction would be immediate preclusion of access to subsurface resources within the analysis area as the Project is constructed. However, this impact would only have consequences in areas within active mining districts where active mines are located. It should be noted that mining districts are not mines; they are large areas within which mining occurs and within which specific mines are located. Because the final route would be sited such that impacts to active mining operations are avoided, construction would cause no direct impacts to operating mines and mining districts. Because construction would be limited to the analysis area, construction-related indirect impacts would not be anticipated. Continued preclusion of access to these resources by virtue of the existence of the Project is described below in the "Operation and Maintenance" section.

However, transmission lines typically have little impact to mining operations. Span lengths are such that access to minerals typically can be accomplished between spans. Should open pit mining be planned, structures can be left on 'islands,' or the mining interests can have the transmission line locally re-routed.

There are 706 lode claims, 12 mineral patent lodes, 8 negotiated mineral material entries, 398 placer claims, 8 mineral patent placer entries, 1 millsite entry, 1 oil and gas geophysical exploration entry, 2 material sites, and 5 community pits in the vicinity of the Proposed Action and Alternative Segments (HDR 2017b; Table 3.3-5). The Project ROW grant would be on the surface only. It would not affect any claims or entries unless the presence of the line limited access to develop the claim or occurrence during construction. Further, it is unlikely the Project would impact material sites or community pits as these developments could be spanned. There are no pre-1955 mineral rights or locations in the Project Area; therefore, there would be no impacts to pre-1955 mineral rights.

Geothermal
No geothermal leases have ever been established on or near the analysis area and there has never been any commercial production anywhere in the broader study area (HDR 2017b). The low temperatures likely preclude the potential for generating electricity, leaving only direct-use applications, like heating greenhouses. The potential for geothermal development in this area is low to very low. For these reasons, no direct or indirect impacts to geothermal resources would be anticipated during operation and maintenance of any Action Alternative.

Other
No wells in the study area are currently producing oil or gas, and there are no coal leases or known coal resources within the ROW or broader study area.

Soil Resources

At the batch plant and lay-down sites, topsoil would be stockpiled and covered during construction and reapplied during reclamation in order to minimize topsoil loss (Appendix 2A). Direct impacts to soil resources as a result of construction activities include the loss of soil productivity due to the removal of soils during new surface disturbance. Limited clearing of vegetation and topsoil, as well as grading, would be required and these activities could result in newly exposed, disturbed soils that could be subject to accelerated erosion by wind and water. Any soil removal associated with development of structure foundations and at the SCS would be permanent and would be a loss of soil productivity. One of the primary impacts of concern for construction is disturbance to soil biological crusts. It is expected that soils within the ROW have the ability to support soil biotic crust; therefore, it is expected that disturbance caused by excavation and compaction during construction may directly affect biological soil crusts. Clearing of the SCS site, ancillary facilities, and access roads could also adversely affect any soil biological crusts in the immediate vicinity. Large portions of the Project have been routed to parallel existing linear infrastructure, thus reducing impacts to previously undisturbed soils.

Indirect impacts associated with topsoil removal may include invasive plant colonization, soil erosion, and reduction of soil water retention. Construction activities may also cause disturbance to fragile biological crusts, which could increase wind and water erosion and delay reestablishment of plant communities post construction. Other indirect effects are associated with the sediment redistribution of the soil resource as a result of wind and water erosion, which could cause damages to WOUS, prime farmlands, and air quality. Implementation of BMPs, APMs, reclamation, and other conservative measures would minimize loss of topsoil and soil productivity to minor but long term due to the slow recovery of soils in desert environments.

Physical Changes to Soil Resources
Surface disturbance, including the removal of topsoil resources for replacement during reclamation, would result in direct impacts. Physical and chemical changes to the soil would be expected to be long-term and minor and would occur as a result of topsoil salvage and reclamation operations. Topsoil that is used to reclaim disturbed areas immediately after construction activities would begin to revert to more natural conditions.

Direct physical impacts to soil resources include compaction and crushing of the topsoil by equipment during salvage, stockpiling, construction, and reclamation activities. Potential physical effects of soil compaction may include reduced permeability and porosity, damage to microbiotic crusts, increased bulk density, decreased available water holding capacity, and increased erosion potential. With adherence to the APMs and BMPs in Appendix 2A, Sections 2A.2 and 2A.13 (notably BIO-38 and SOIL-02), physical effects of soil compaction would be short-term, minor to moderate. Soil microorganisms such as bacteria and fungi, important in the decomposition of biological materials and the formation and improvement of soil, would be impacted. Natural processes, such as wind and water transport of soil particles from surrounding areas would continually inoculate the site with these microorganisms.

Soil Loss/Erosion
Soil erosion potential is determined based on physical soil characteristics, k-factor rating, and slope. Areas located on steep slopes are inherently susceptible to erosion. The majority of reclaimed areas for all Action Alternatives would incorporate a generally flat to gently sloped surface during regrading and reclamation activities. Potential for erosion would be increased on disturbed areas after soil salvage operations due to removal of the vegetative cover and the loss of surface soil structure. Soil erosion after redistribution on re-graded sites would also have a greater potential until the soil is stabilized by successful revegetation. Soil characteristics identified in Appendix 3A suggest that all segments west of the Colorado River include soils that have a high susceptibility for wind erosion. Windblown dust would result from the disturbance of fine-textured soils during construction and reclamation activities through the completion of the Project.

The majority of the impacts to soil resources would be temporary (Table 2.2-15 and Table 2.4-10), until reclamation was complete. The footprints of the structures, the SCS site, and new access roads would result in permanent impacts to soil resources. Cutting and removal of vegetation may occur; however, where practicable, downed vegetation and undisturbed low vegetation would be left in place within the disturbance areas to serve as soil protection and erosion control. Vegetation would only be cleared to the extent necessary, minimizing impacts to soil resources. Adherence to APM-GEO-01 and APM-WQ-01 (Appendix 2A, Sections 2A.2 and 2A.13) would minimize water erosion through implementation of a SWPPP. Further, Project engineering would consider soil characteristics and hazard in design. Impacts from soil loss/erosion would be negligible to minor and short to long term as areas revegetate.

Soil Hazards
Project-related construction (and, to a far lesser extent, operation) fugitive-dust emissions could include emissions of spores from a soil dwelling fungus that causes valley fever, which occurs across arid areas in the southwestern United States and may occur in the Project Area. When soil is disturbed by activities such as grading, digging, vehicle operation on dirt roads, or high winds, the fungal spores can become airborne and potentially inhaled (BLM 2015a). The risk of valley fever would be highest for construction workers or others in proximity to soil disturbance activities associated with construction of the Project. Past research has indicated that seasonal rain events can result in a fungal bloom in the soil and if followed by a hot, arid season, the soil dries out, spores become brittle and fracture, which leads to more spores in the air (Sprigg et al. 2014). To suspend this natural life cycle and limit spore emissions across localized areas, continued soil wetness, such as construction-related watering for dust suppression, can be a preventative factor to control dust or spore emissions during construction. Therefore, it is important for Project construction to be conducted in a way that minimizes fugitive-dust emissions, which would also minimize emissions of the fungal spores that could be present in a given area. Accordingly, APM-AQ-01, BMP-AQ-01, APM-AQ-03, and APM-AQ-04 (Appendix 2A, Section 2A.1) would minimize the risk of exposure to valley fever and asbestos for workers and the public. Soil hazard impacts would be negligible to minor and short term.

4.3.4.2 East Plains and Kofa Zone

Direct and Indirect Effects Common to All Segments in the Zone

Geology
Within the East Plains and Kofa Zone, there is low liquefaction potential (Appendix 1, Figure 3.3-5). Site-specific geotechnical tests would be required to determine the specific liquefaction potential at a given location. Project engineering would consider liquefaction hazard in design; potential impacts to the Project from liquefaction would be negligible and long term.

Soil Resources
As presented in Table 3.3-6, 10 of the 15 soil associations found within the study area are in the East Plains and Kofa Zone. Soils and their characteristics vary highly in this zone with low to high erodibility.

Direct and Indirect Segment-specific Effects

The following sections only identify distinguishing characteristics associated with specific segments in the East Plains to Kofa Zone. If a specific segment is not identified, it should be assumed that the general impacts described in Section 4.3.4.1 would occur.

Minerals
The Hilltop Mine, a past producer of lead and silver, is located within the study area along Segment i-03. The Grace 1 and 2 stone occurrences are located along Segment i-04. Lastly, the Guadalupe Mine, a past producer of lead, copper, silver, gold, and iron, is located along Segment in-01. The Project would not affect these mines or occurrences unless the presence of the transmission line prevented access to develop the material, which would only potentially be the case during construction, and on an active mining operation. None of these are known to be operational.

4.3.4.3 Quartzsite Zone

Direct and Indirect Effects Common to All Segments in the Zone

Geology
Within the Quartzsite Zone, there is low liquefaction potential (Appendix 1, Figure 3.3-5). Site-specific geotechnical tests would be required to determine the specific liquefaction potential at a given location. Project engineering would consider liquefaction hazard in design; potential impacts to the Project from liquefaction would be negligible and long term.

Soil Resources
As presented in Table 3.3-6, 2 of the 15 soil associations found within the study area are in the Quartzsite Zone. Soils in this zone have moderate to high or unknown erodibility.

Direct and Indirect Segment-specific Effects

The following sections only identify distinguishing characteristics associated with specific segments in the Quartzsite Zone. If a specific segment is not identified, it should be assumed that the general impacts described in Section 4.3.4.1 would occur.

Minerals
The Oro Fino Gold Placers (past producer - gold, silver, tungsten, and lead) and the Grace 1 and 2 marble/limestone occurrences are in the vicinity of Segment qn-02. The Shadow Mountain Claims (past producer – gold) and Julian Mine Group (past producer – gold, silver, lead, copper, zinc) are in the vicinity of Segment qs-02. The New York-Plomosa prospect (gold) is located in the vicinity of Segment x-05. The Project would not affect these mines or occurrences unless the presence of the transmission line prevented access to develop the material, which would only potentially be the case during construction, and on an active mining operation. None of these are known to be operational.

4.3.4.4 Copper Bottom Zone

Direct and Indirect Effects Common to All Segments in the Zone

Geology
Within the Copper Bottom Zone, there is low and unknown liquefaction potential (Appendix 1, Figure 3.3-5). Site-specific geotechnical tests would be required to determine the specific liquefaction potential at a given location. Project engineering would consider liquefaction hazard in design; potential impacts to the Project from liquefaction would be negligible and long term.

Soil Resources
As presented in Table 3.3-6, 2 of the 15 soil associations found within the study area are in the Copper Bottom Zone. Soils in this zone have moderate to high or unknown erodibility.

Direct and Indirect Segment-specific Effects

The following sections only identify distinguishing characteristics associated with specific segments in the Copper Bottom Zone. If a specific segment is not identified, it should be assumed that the general impacts described in Section 4.3.4.1 would occur.

Minerals
The French-American prospect (mercury, copper, gold, etc.), the Copper Bottom prospect (silver, gold, copper), the Copper Bottom Mine (past producer – gold, copper, silver), the Bee Hive prospect (gold, copper), and the La Chacha and Scott Weaver occurrence (copper) are in the vicinity of Segment p-10. A kyanite occurrence, Strange Silica claims (silica, quartz), and Oro Fino Placers mine (past producer – gold, silver, etc.) are in the vicinity of Segment i-06. The Project would not affect these mines, prospects, or occurrences unless the presence of the transmission line prevented access to develop the material, which would only potentially be the case during construction, and on an active mining operation. None of these are known to be operational.

Soil Resources
The construction of Segments p-09, p-10, p-11, and cb-01/cb-02 would require helicopter fly yards, which would increase the potential for fugitive dust and the threat of valley fever for construction workers and the public near the fly yards. The Erosion, Dust, and Air Quality Plan would include information about the reduction of dust emissions generated from helicopter use. Further, adherence to APM-AQ-01, BMP-AQ-01, and APM-AQ-04 (Appendix 2A, Section 2A.1) would minimize the risk of exposure to valley fever for workers and the public. Therefore, these effects would be negligible to minor and short term.

4.3.4.5 Colorado River and California Zone

<u>Direct and Indirect Effects Common to All Segments in the Zone</u>

Geology
As shown in Figure 3.3-5 (Appendix 1), most the study area west of the Colorado River has a very high to moderate liquefaction risk because of the presence of shallow groundwater, the type of soils present, and the potential for ground shaking from an earthquake. Site-specific geotechnical tests would be required to determine the specific liquefaction potential at a given location. Project engineering would consider liquefaction hazard in design; potential impacts to the Project from liquefaction would be negligible and long term.

Soil Resources
As presented in Table 3.3-6, 6 of the 15 STATSGO soil associations found within the study area are in the Colorado River and California Zone. Soils and their characteristics vary highly in this zone with low to high erodibility.

Perhaps the most sensitive issue for soils on BLM administered lands in the Colorado River and California Zone is the potential impact to the sand dunes west of Blythe and north of the Colorado Substation, due to the sand dunes' value as habitat for sensitive species (Section 3.5.3.1). As noted in Section 3.3, objects as low as 30 cm above the ground surface can interfere with sand transport, creating a "sand shadow" and reducing the size of downwind dunes. The Colorado Substation was initially proposed to be constructed in the center of the sand dunes, but ultimately was constructed at its current site south of the dunes specifically to avoid impacting sand transport.

Direct and Indirect Segment-specifics Effects

The following sections only identify distinguishing characteristics associated with specific segments in the Colorado River and California Zone. If a specific segment is not identified, it should be assumed that the general impacts described in Section 4.3.4.1 would occur.

Minerals
The American Flag Mine (past producer – gold) is in the vicinity of Segment p-18. The Project would not affect this mine unless the presence of the transmission line prevented access to develop the material, which would only potentially be the case during construction, and on an active mining operation. None of these are known to be operational.

Soil Resources
The Proposed Action along Segments p-17 and p-18 would site the transmission line south of the active windblown deposits (Appendix 1, Figure 3.3-8) and would likely have negligible impacts on sand transport.

The use of either Segments p-17 and p-18 or ca-07, ca-09, and x-19 would be used to access the Colorado River Substation from the east. Tangent lattice structures are proposed to be used, regardless of the route taken. Because of their open design, tangent lattice structures would allow winds to essentially blow through the structure, minimizing the impact on sand transport (as compared to solid structures, like buildings or walls).

The foundations for the lattice tangent structures along Segments p-17 and p-18 (Appendix 1, Figure 3.3-8) would run south of the active windblown deposits and would disturb only 2.6 acres for the long-term over a linear transmission line distance of 5.5 miles (Table 2.2-6). Each corner of the self-supporting tangent and dead-end structures would have a foundation of 4 feet in diameter and extend approximately two feet (61 cm) above ground level (Section 2.2.3.2). The portions of the foundations that extend above ground level would intermittently interrupt sand transport on the upwind side. Access roads, as required, would be at grade and only minimally impact sand transport. For Segments p-17 and p-18, access roads would impact 18.3 acres. These intermittent disruptions of the flow of sand across the surface of the landscape for short distances would have a very localized impact on sand transport in the immediate area of the access roads and structure foundations in the long term. Therefore, because of the distance between these segments and the active windblown deposits to the north, impacts to active windblown deposits would be negligible.

Alternatively, Segments ca-07, ca-09, and x-19 (Appendix 1, Figure 3.3-8) would have a similar foundation footprint for tangent lattice, guyed-v, and dead-end lattice structures of 2.1 acres over a linear distance of 6.6 miles (Table 2.4-7), portions of which travel through the dunes. Access roads for these segments would impact 26.5 acres. These segments would have a greater impact on active windblown deposits because portions of the segments would cross more active areas of the dunes, but because of the widely spaced nature of the individual foundations and associated roads, that impact would be considered long-term and negligible to minor.

The construction of Segments p-09, p-10, p-11, and cb-01/cb-02 would require helicopter fly yards, which would increase the potential for fugitive dust and the threat of valley fever for construction workers and the public near the fly yards. The Erosion, Dust, and Air Quality Plan would include information about the reduction of dust emissions generated from helicopter use. Further, adherence to APM-AQ-01, BMP-AQ-01, and APM-AQ-04 (Appendix 2A, Section 2A.1) would minimize the risk of exposure to valley fever and for workers and the public. Therefore, these effects would be negligible to minor and short term.

4.3.5 Operations, Maintenance, and Decommissioning

Operation and maintenance of the Project, as it relates to impacts to geology and mineral resources, would primarily consist of the presence of the transmission line and maintenance roads and how they preclude access to subsurface resources in the immediate vicinity. Potential impacts from operation include:

- continued preclusion of access to mineral and petroleum resources (direct); and
- damage to the Project from preexisting or exacerbated geological hazards such as mass wasting events, hazards due to slope instability, or the effects of earthquakes or land subsidence (direct).

4.3.5.1 Geology

Earthquakes

The seismic hazard is relatively low ("moderate to low" to "low") for the region that encompasses all Action Alternatives. No direct or indirect impacts would be anticipated from earthquakes during operation and maintenance of any Action Alternative.

Faults

No active faults have been mapped in any ROW for the Action Alternatives or broader study area.

Liquefaction

Project engineering would consider liquefaction hazard in design and the transmission line would be constructed appropriate to the liquefaction potential; impacts to the Project from liquefaction during operations and maintenance would be negligible and long-term. No impacts from liquefaction are expected during decommissioning, if and when it occurs.

Landslides

Neither operation nor maintenance of the Project would involve blasting, road-cutting, ground disturbance, or other activities that could exacerbate the potential for landslides and mass wasting. Therefore, operation and maintenance of the Project would not be expected to have any direct or indirect effects on the potential for landslides.

Decommissioning activities, if and when they occur in the future, would have negligible impacts, and be similar to those described for construction activities.

Land Subsidence

Most cases of land subsidence in the Southwest are caused by excessive groundwater pumping. This type of subsidence occurs very slowly over decades and affects broad areas; as such, structures sink uniformly with the ground and are not damaged. Because the severity of subsidence increases from the edges to the center like a bowl, certain infrastructure like canals and sewers, which rely on slope, can be damaged or rendered inoperable (AZGS 2007). Transmission lines, however, are not slope-dependent and would not be affected in such a way. Therefore, no direct or indirect effects on the Project would be anticipated from land subsidence, during operation, maintenance, and decommissioning activities.

4.3.5.2 Minerals

Mining Districts

During operation and maintenance of the Project, subsurface resources would be physically precluded from access in the immediate vicinity of the structures. Blasting would be restricted in the vicinity of the structures and anywhere within the ROW. However, the final route would be located such that impacts to active mining operations are avoided. Therefore, operation and maintenance of the Project would not directly impact active mines or mining districts. The location of a valid mining claim gives a mining claimant possessory rights to the lands superior to any subsequent appropriations.

However, transmission lines typically have little impact to mining operations. Span lengths are such that access to minerals can typically be accomplished between spans. Should open pit mining be planned, structures can be left on ‘islands’, or the mining interests can have the transmission line locally re-routed.

Decommissioning activities, if and when they occur in the future, would have negligible impacts, and be similar to those described for construction activities.

Geothermal Resources

No geothermal leases have ever been established on or near the ROW, and there has never been any commercial production anywhere in or near the analysis area. The low temperatures likely preclude the potential for generating electricity, leaving only direct-use applications, like heating greenhouses. The potential for geothermal development in this area is low to very low. No commercially viable geothermal resources are located in the analysis area. For these reasons, no direct or indirect impacts to geothermal resources would be anticipated during operation, maintenance, and decommissioning of any Action Alternative.

4.3.5.3 Soil Resources

Impacts to soil resources as a result of operation and maintenance activities are expected to be minimal. Minimal soil resource management would be needed during transmission line operation and most inspection activities would be carried out aerially. On-the-ground inspection would cause negligible damage to existing soil resources because vehicle use would be confined to existing roadways. No indirect effects are expected during the operation and maintenance activities.

Decommissioning activities, if and when they occur in the future, would have negligible impacts, as established access roads and other permanent impact areas would be used.

4.3.6 Mitigation Measures

There are no MMs identified for geology, minerals, or soil resources for any of the specific segments and thus, no MMs have been identified for any of the full route alternatives or subalternatives described below. APMs, and the BLM developed required BMPs, that would be implemented for the Project would further reduce impacts to soil resources.

4.3.7 Construction of Full Route Alternative and Subalternative Effects

Table 4.3-1 shows the construction (short-term, temporary) disturbance and operations (long-term) disturbance associated with each of the Action Alternatives. Short-term acreage includes acreage that would not be reclaimed following construction (i.e., long-term disturbance).

Table 4.3-1 Soil Disturbance by Full Route Alternative in Acres

FULL ROUTE ALTERNATIVE	CONSTRUCTION DISTURBANCE (SHORT TERM)	OPERATIONS AND MAINTENANCE DISTURBANCE (LONG TERM)	TOTAL DISTURBANCE*
Proposed Action	709.1.	410.1	1,086.0
Alternative 1: I-10 Route	648.3	390.3	1,004.9
Alternative 2: BLM Utility Corridor	754.8	462.8	1,181.0
Alternative 3: Avoidance Route	768.1	466.48	1,199.0
Alternative 4: Public Lands Emphasis Route	760.4	468.1	1,197.2

* Long-term foundation disturbance would be within and a subset of the short-term disturbance; therefore, it is not additive to the short-term disturbance in totals.

4.3.7.1 Proposed Action

<u>Geology</u>

Under the Proposed Action, a portion of the route would cross an area mapped as having very high liquefaction potential. However, a geotechnical engineering study would be completed prior to final design and construction of the Project to identify site-specific geological conditions and potential geological hazards. Foundation design would be consistent with geological conditions for each structure site. Therefore, geological impacts would be negligible and long term.

Minerals

There would be negligible, short-term effects to minerals under the Proposed Action. There are no known active mining operations along the Proposed Action. The Proposed Action would not affect claims or mineral occurrences unless the presence of the transmission line prevented access to develop the material, which would only potentially occur during construction at an active mining operation. Transmission lines typically have little impact to mining operations. Span lengths are such that access to minerals can be accomplished between spans.

Soil Resources

Under the Proposed Action, there would be negligible to minor short- and long-term effects to soils and the effects would differ because of soil types. Approximately 1,086 acres of soils would be disturbed associated with transmission line construction, access roads, temporary use areas, and the SCS. Long-term loss of soil productivity would occur on 410 acres of disturbance that would not be restored during the term of the ROW permit. The remaining 709 acres would likely have long-term loss of soil productivity, but productivity would improve during the term of the ROW permit because of reclamation efforts that would be required. The Proposed Action west of the Colorado River includes soils that have a high susceptibility for wind erosion.

As shown in Figure 3.3-8 (Appendix 1), the Proposed Action route south of the Colorado River Substation would avoid active windblown sand areas and habitat. Consequently, as described in Section 4.3.4.5, impacts to areas of active windblown sand would be negligible and long term.

4.3.7.2 Alternative 1: I-10 Route

Geology

Under Alternative 1, a portion of the route would cross an area mapped as having very high liquefaction potential on the west side of the Colorado River, similar to the Proposed Action. However, a geotechnical engineering study would be completed prior to final design and construction of the Project to identify site-specific geological conditions and potential geological hazards. Foundation design would be consistent with geological conditions for each structure site. Therefore, geological impacts would be negligible and long term.

Minerals

There would be negligible, short-term effects to minerals under Alternative 1. There are no known active mining operations along the Alternative 1. The alternative would not affect claims or mineral occurrences unless the presence of the line prevented access to develop the material, which would only potentially occur during construction at an active mining operation. Transmission lines typically have little impact to mining operations. Span lengths are such that access to minerals can be accomplished between spans.

Soil Resources

Under Alternative 1, there would be negligible to moderate short- and long-term effects to soils and the effects would differ because of soil types. Approximately 1,005 acres of soils would be disturbed associated with transmission line construction, access roads, temporary use areas, and the SCS, a decrease in disturbance compared to the Proposed Action. Long-term loss of soil productivity would occur on 390 acres of disturbance that would not be restored during the term of the ROW permit. The remaining 648 acres would likely have long-term loss of soil productivity, but productivity would improve during the term of the ROW permit because of reclamation efforts that would be required. Alternative 1 west of the Colorado River includes soils that have a high susceptibility for wind erosion.

As shown in Figure 3.3-8 (Appendix 1), Alternative 1 approaching the Colorado River Substation from the east would pass through portions of active area of windblown sand. As described in Section 4.3.4.5, because of the intermittent nature of the structure foundations, and the spacing between structures, this would constitute a long-term, negligible to minor impact to the dune habitat.

Subalternatives to Alternative 1 (1A through 1E)

There would be negligible differences in effects to geology and minerals between the Alternative 1 subalternatives (1A through 1E) and Alternative 1.

There would be minimal differences in the amounts of acres of soil disturbed between the Alternative 1 subalternatives (1A through 1E) and Alternative 1 (Table 4.20-8).

4.3.7.3 Alternative 2: BLM Utility Corridor Route

Geology

Under Alternative 2, a portion of the route would cross an area mapped as having very high liquefaction potential on the west side of the Colorado River, similar to the Proposed Action and Alternative 1. However, a geotechnical engineering study would be completed prior to final design and construction of the Project to identify site-specific geological conditions and potential geological hazards. Foundation design would be consistent with geological conditions for each structure site. Therefore, geological impacts would be negligible and long term.

Minerals

There would be negligible, short-term effects to minerals under Alternative 2. There are no known active mining operations along the Alternative 2. The alternative would not affect claims or mineral occurrences unless the presence of the transmission line prevented access to develop the material, which would only potentially occur during construction at an active mining operation. Transmission lines typically have little impact to mining operations. Span lengths are such that access to minerals can be accomplished between spans.

Soil Resources

Under Alternative 2, there would be negligible to moderate short- and long-term effects to soils and the effects would differ because of soil types. Approximately 1,181 acres of soils would be disturbed associated with transmission line construction, access roads, temporary use areas, and the SCS, an increase in disturbance compared to the Proposed Action and Alternative 1. Long-term loss of soil productivity would occur on 463 acres of disturbance that would not be restored during the term of the ROW permit. The remaining 755 acres would likely have long-term loss of soil productivity, but productivity would improve during the term of the ROW permit because of reclamation efforts that would be required. Alternative 2 west of the Colorado River includes soils that have a high susceptibility for wind erosion.

As shown in Figure 3.3-8 (Appendix 1), Alternative 2 approaching the Colorado River Substation from the east would pass through portions of an area of active windblown sand. As described in Section 4.3.4.5, because of the intermittent nature of the structure foundations, and the spacing between structures, this would constitute a long-term, negligible to minor impact to the dune habitat.

Subalternatives to Alternative 2 (2A through 2E)

There would be negligible differences in effects to geology and minerals between the Alternative 2 subalternatives (2A through 2E) and Alternative 2.

There would be minimal differences in the amounts of acres of soil disturbed between the Alternative 2 subalternatives (2A through 2E) and Alternative 2 (Table 4.20-9).

4.3.7.4 Alternative 3: Avoidance Route

Geology

Under Alternative 3, a portion of the route would cross an area mapped as having very high liquefaction potential on the west side of the Colorado River, similar to the Proposed Action and other Action Alternatives. However, a geotechnical engineering study would be completed prior to final design and construction of the Project to identify site-specific geological conditions and potential geological hazards. Foundation design would be consistent with geological conditions for each structure site. Therefore, geological impacts would be negligible and long term.

Minerals

There would be negligible, short-term effects to minerals under Alternative 3. There are no known active mining operations along the Alternative 3. The alternative would not affect claims or mineral occurrences unless the presence of the transmission line prevented access to develop the material, which would only potentially occur during construction at an active mining operation. Transmission lines typically have little impact to mining operations. Span lengths are such that access to minerals can be accomplished between spans.

Soil Resources

Under Alternative 3, there would be negligible to moderate short- and long-term effects to soils and the effects would differ because of soil types. Approximately 1,199 acres of soils would be disturbed associated with transmission line construction, access roads, temporary use areas, and the SCS, an increase in disturbance compared to the Proposed Action and Alternative 1 and similar to Alternative 2. Long-term loss of soil productivity would occur on 466 acres of disturbance that would not be restored during the term of the ROW permit. The remaining 768 acres would likely have long-term loss of soil productivity, but productivity would improve during the term of the ROW permit because of reclamation efforts that would be required. Alternative 3 west of the Colorado River includes soils that have a high susceptibility for wind erosion.

As shown in Figure 3.3-8 (Appendix 1), Alternative 3 approaching the Colorado River Substation from the east would pass through portions of an area active windblown sand. As described in Section 4.3.4.5, because of the intermittent nature of the structure foundations, and the spacing between structures, this would constitute a long-term, negligible to minor impact to the dune habitat.

Subalternatives to Alternative 3 (3A through 3M)

There would be negligible differences in effects to geology and minerals between the Alternative 3 subalternatives (3A through 3M) and Alternative 3.

There would be minimal differences in the amounts of acres of soil disturbed between the Alternative 3 subalternatives (3A through 3M) and Alternative 3 (Table 4.20-10).

4.3.7.5 Alternative 4: Public Lands Emphasis Route

Geology

Under Alternative 4, a portion of the route would cross an area mapped as having very high liquefaction potential on the west side of the Colorado River, similar to the Proposed Action and other three Action Alternatives. However, a geotechnical engineering study would be completed prior to final design and construction of the Project to identify site-specific geological conditions and potential geological hazards. Foundation design would be consistent with geological conditions for each structure site. Therefore, geological impacts would be negligible and long term.

Minerals

There would be negligible, short-term effects to minerals under Alternative 4. There are no known active mining operations along the Alternative 4. The alternative would not affect claims or mineral occurrences unless the presence of the transmission line prevented access to develop the material, which would only potentially occur during construction at an active mining operation. Transmission lines typically have little impact to mining operations. Span lengths are such that access to minerals can be accomplished between spans.

Soil Resources

Under Alternative 4, there would be negligible to moderate short- and long-term effects to soils and the effects would differ because of soil types. Approximately 1,197 acres of soils would be disturbed associated with transmission line construction, access roads, temporary use areas, and the SCS, a decrease in disturbance compared to all alternatives, except for Alternative 1. Long-term loss of soil productivity would occur on 468 acres of disturbance that would not be restored during the term of the ROW permit. The remaining 760 acres would likely have long-term loss of soil productivity, but productivity would improve during the term of the ROW permit because of reclamation efforts that would be required. Alternative 4 west of the Colorado River includes soils that have a high susceptibility for wind erosion.

As shown in Figure 3.3-8 (Appendix 1), Alternative 4 approaching the Colorado River Substation from the east would pass through portions of an area of active windblown sand. As described in Section 4.3.4.5, because of the intermittent nature of the structure foundations, and the spacing between structures, this would constitute a long-term, negligible to minor impact to the dune habitat.

Subalternatives to Alternative 4 (4A through 4P)

There would be negligible differences in effects to geology and minerals between the Alternative 4 subalternatives (4A through 4P) and Alternative 4.

There would be minimal differences in the amounts of acres of soil disturbed between the Alternative 4 subalternatives (4A through 4P) and Alternative 4 (Table 4.20-11). However, Subalternative 4P would utilize the Proposed Action Segments p-17 and p-18, thus avoiding the area of active windblown sand; consequently, Subalternative 4P would have less impact on the areas of windblown sand than Alternative 4 and Subalternatives 4A through 4N.

4.3.8 Residual Impacts

4.3.8.1 Geology and Minerals

The APMs and BMPs described in Appendix 2A would eliminate or reduce impacts to geology and mineral resources, although transmission lines typically have little impact to mining operations. Access to minerals can be accomplished between spans, or structures can be left on 'islands', or where the claims postdate issuance of the ROW the mining interests can have the transmission line locally re-routed. In this case, as the transmission lines would not impact the baseline condition of the resource; there would be no residual impacts. The area of potential impact would vary with each alternative, subalternative, and combination of segments. If the area under the ROW was never intended to be mined regardless of the Project, then there would be no residual impacts.

4.3.8.2 Soil Resources

The APMs and BMPs described in Appendix 2A would likely alleviate most all impacts to the soil resources as a result of the Project, except for impacts to areas of active windblown sand under the Action Alternatives, where impacts would be negligible to minor following Project construction, as described in Section 4.3.4.5. Maintenance activities aimed at precluding soil erosion would be ongoing; therefore, impacts would be negligible following the Project construction.

4.3.9 CDCA Plan Compliance

4.3.9.1 Geology and Minerals

There are no CMAs related to geology and minerals that would apply to the Project.

4.3.9.2 Soil Resources

Under LUPA-BIO-DUNE-1, evaluation of the Project found that:

- Portions of Segments ca-07, ca-09, and x-19 would cross areas of active windblown sand.

- Because portions of Segments ca-07, ca-09, and x-19 would cross areas of active windblown sand, those segments would be subject to dune/aeolian sand transport corridor CMAs.
- Thus, alternatives exist that would avoid crossing identified areas of active windblown sand, and thus reduce impacts.

Under LUPA-BIO-DUNE-2, evaluation of the Project found that Segments p-17 and p-18 would result in fewer impacts to windblown sand than the Action Alternative segments, and thus better maintaining the quality and function of aeolian transport corridors. However, the long-term impacts to areas of windblown sand from Segments ca-07, ca-09, and x-19 would be negligible to minor. Portions of LUPA-BIO-DUNE-2 and LUPA-BIO-DUNE-3 would be satisfied by application of BMP-WQ-06 and BMP-WQ-07.

CMAs LUPA-SW-1, LUPA-SW-2, and LUPA-SW-5 would apply to the Project (Appendix 2C) and would be satisfied by information provided in Section 2.2.8; Section 4.3, and Section 4.2.10, respectively. LUPA-SW-6 through LUPA-SW-11 would also apply to the Project (Appendix 2C). The Project would comply with these CMAs through APM-GEO-01 and BMP-HAZ-01 and BMP-SOIL-04 through BMP-SOIL-07 (Appendix 2A, Section 2A.2 and 2A.9).

4.3.10 Unavoidable Adverse Effects

4.3.10.1 Geology and Minerals

Because transmission lines typically have little impact to mining operations, access to minerals can be accomplished between spans, and structures can be left on 'islands' or the mining interests can have the transmission line locally re-routed, there would be no unavoidable adverse impacts to geological and mineral resources.

4.3.10.2 Soil Resources

Residual unavoidable impacts to soil productivity and areas of active sand transport in the Project Area would remain after mitigation. The impacts would occur in those areas with structures and other permanent facilities, e.g., the SCS, permanent access roads, and transmission structures. Decreased soil productivity would result.

4.3.11 Cumulative Effects

4.3.11.1 Geology and Minerals

<u>Cumulative Effects Common to All Action Alternatives</u>

The analysis area for cumulative impacts to geology and mineral resources is the CEA described in Section 3.20.2 and encompasses 711,573 acres. The temporal scope is for the life of the Project, which is 50 years. This CEA for analyzing potential cumulative impacts to geology and mineral resources represents a reasonable region in which existing geological and mineral resources, when assessed in combination with other cumulative actions, would be impacted if the Proposed Action or Action Alternatives were implemented. Cumulative actions discussed herein are based on the existing conditions of the geological and mineral resources affected environment described in the relevant land uses presented in Tables 3.20-4a, 3.20-5, and 3.20-6.

As noted in Table 3.20-4a, 165,197 acres or 23.2 percent of the CEA has been previously disturbed. However, most of this disturbance has been surficial and likely has not impacted geology. Access to minerals, if present, and areas available for mining has been reduced.

The Proposed Action, or any of the Action Alternatives, when combined with reasonably foreseeable actions and disturbances would contribute disturbance to geology and minerals and thus a cumulative impact. When combined, reasonably foreseeable future developments/disturbances in the CEA, as presented in Table 4.3-2, potentially total 26,905 acres. This equates to an additional disturbance of 3.8 percent of the CEA. However, much of this would be surficial (22,525 acres of solar facilities) and would not affect geology or minerals. The cumulative effects of the Project, when combined with past, present, and reasonably foreseeable disturbances, on mineral and geological resources would be minor and its effect on topography would be negligible to minor.

Table 4.3-2 Reasonably Foreseeable Future Project Potential Disturbance in CEA

ZONE	PROJECT	TYPE	ACRES
EP&K	La Paz County Land Conveyance	Solar Facility	5,935
QTZ	Plomosa 9 Placer Claim	Mine	20
QTZ	Quartzsite Wastewater Treatment Plant	Infrastructure	16.7*
CB	West Port Gold	Mine	40
CR&CA	Blythe Energy Power Plant/ Sonoran Energy Project	Power Plant	76
CR&CA	Blythe Mesa Solar Project	Solar Facility	7,025
CR&CA	Desert Quartzite Solar Project	Solar Facility	4,800
CR&CA	Crimson Solar	Solar Facility	2,700
Total			**20,596**

* expansion would be within existing facility footprint; therefore, it is not included in total disturbance.

A number of current and proposed projects have been identified, which, when combined with the Project, may potentially result in cumulative impacts. Within the 711,753-acre CEA, 395,688 acres are BLM-administered land which are generally open to mineral extraction. Any of the surficial present or reasonably foreseeable future projects, if they overlap with mining districts or claims, would reduce the area available for mining. However, because only some mining districts or claims are active, and because the projects are likely to cover only a fraction of the mining districts they cross (and assuming that active mines are avoided), there would be no obvious changes in the baseline conditions of local geology or access to mineral resources. Additionally, transmission lines typically have little impact to mining operations. Span lengths are such that access to minerals can be accomplished between spans. New transmission lines are often routed along existing linear features. Should open pit mining be planned, structures can be left on 'islands,' or the mining interests can have the transmission line locally re-routed. Therefore, there would be negligible cumulative impacts to geology and mineral resources.

Past, present, and reasonably foreseeable future projects in the CEA would all be susceptible to similar risks from seismic events. Adherence to state and local regulations related to site engineering would be required. The Project would implement an Emergency Response and Inventory Plan, and other projects would likely require similar measures. Appropriate engineering and mitigation would minimize both the incremental risk related to the Project and the overall cumulative effects. Consequently, there would be negligible cumulative effects related to seismic hazards.

Zone Specific Cumulative Effects

East Plains and Kofa Zone
The La Paz County land conveyance for solar development is proposed in the East Plains and Kofa Zone; it would disturb up to 5,935 acres. This in conjunction with the Project would be a negligible to minor cumulative increase in the disturbance in the CEA in this zone.

Quartzsite Zone
The Plomosa 9 is a proposed 20-acre placer claim mine that would be located southeast of Quartzsite. The renovation/expansion of the Quartzsite Wastewater Treatment Plant would be within the existing 16.7-acre development area. This in conjunction with the Project would be a negligible increase in cumulative disturbance in the CEA in this zone.

Copper Bottom Zone
The Ehrenberg Wash Pit expansion is an existing 40-acre open pit being expanded by 20 acres. The West Port Gold project is an approved 40-acre open-pit mine located northwest of Quartzsite. This in conjunction with the Project would be a negligible cumulative increase in disturbance in the CEA in this zone.

Colorado River and California Zone
The Blythe Energy Power Plant/Sonoran Energy Project (76 acres), the Blythe Mesa Solar Project (7,025 acres), the Desert Quartzite Solar Project (4,800 acres), and the Crimson Solar Project (2,700 acres) would all be within the Colorado River and California Zone. Existing quantifiable land use disturbances presented in Table 3.20-4a include 71,329 acres or 73.9 percent of the zone. Reasonably foreseeable disturbances, in conjunction with the Project would account for an additional 14,601 acres of disturbance, bringing the disturbance in this zone up to 89 percent within the 2-mile CEA. This in conjunction with the Project would be a negligible to minor cumulative disturbance in the CEA in this zone.

4.3.11.2 Soil Resources

The analysis area for cumulative impacts to soil resources is the CEA described in Section 3.20.2. Cumulative actions are based on the existing conditions of the soil resources affected environment described in Chapter 3.

The past uses in the CEA have had a direct effect on the soils, as described in Chapters 3 and 4. Within the 711,573-acre CEA, approximately 165,197 acres (23.2 percent) have been disturbed (Table 3. 20-4a). The use of land through activities such as mining, ranching, roads, solar projects, transmission lines, and OHV use have all shaped the current state of the soil resources. The impacts of present actions in the CEA would be very similar to the past actions

Reasonably foreseeable actions in the CEA that, when combined with the Project construction, may have cumulative impacts to the soil resources, including increased wind and water erosion rates in areas where ground surface disturbance occurs. The foreseeable actions within the CEA include the approved but not yet operational West Port Gold Mine, the development of the Plomosa 9 Placer Claim, several large solar facility projects, gas-fired power plant construction, and likely future expansion of the communities and roadways within the CEA (Table 3.20-3).

During operation and maintenance of the Project, the interaction of the actions within the CEA and the Project could result in a beneficial, minor, and short-term cumulative effect for the soil resources. During this phase, roads would be maintained resulting in reduced wind and water erosion of soils. However, when the operation and maintenance of the Project is combined with future development, a minor cumulative effect would occur. Since the majority of the Project utilizes existing ROWs and disturbed areas, this use would result in a minor impact that would be long-term and for the life of the Project. Impacts would include the loss of soil resources from sites occupied by facilities or OHV use during construction on any of the reasonably foreseeable future projects identified with inadequate access control. Further, operation and maintenance activities of the Project would result in negligible cumulative effects post-construction. Standard operation and maintenance activities would be periodic and would not affect soil resources as they recover from construction impacts. Reclamation can recover some of the soil productivity, but is not 100 percent effective. The implementation of design features, APMs, BMPs, and reclamation on any of these projects would minimize soil impacts; therefore, both the short- and long-term cumulative impacts of the Project would be negligible.

The reasonably foreseeable future projects (Table 3.20-6) have the potential to disturb an estimated 20,596 acres (2.9 percent of CEA). Any disturbance to surface soils through grading or other ground disturbance can potentially result in accelerated erosion at any one project site. However, with incorporation of APMs, BMPs, and MMs similar to those implemented by the Project to address erosion and loss of topsoil, impacts from erosion can be mitigated. Therefore, with APMs, BMPs, and MMs applied to the Project, even if a cumulative impact did exist given all the reasonably foreseeable future projects, the Project would not contribute to any considerable impacts caused by an acceleration of erosion during construction. The potential impact is localized to the Project site and proper mitigation is in place to ensure any direct, indirect, or cumulative impacts would represent a mitigated cumulative impact.

Climate change could impact soils, the magnitude of which will be dependent on the amount of change in temperatures, atmospheric gases, and precipitation amounts and patterns (Brevik 2012). For example, intense wind or water erosion could occur, particularly if the monsoon were to become characterized by more intense storms as has been the case recently in eastern Riverside County. This effect combined with already disturbed soils could lead to greater erosion impacts than might have been expected in the past. A cumulative degradation of soils would contribute an incremental impact to climate change.

Zone-Specific Cumulative Effects

Potential cumulative impacts to soils in this zone would be from the same projects as described under geology and minerals. The La Paz County land conveyance solar facility would be subject to design features and BMPs that would mitigate erosion and soil loss. When combined with past, present, and reasonably foreseeable projects, there would be negligible to minor cumulative effects to soils.

Quartzsite Zone
Potential cumulative impacts to soils in this zone would be from the same projects as described under geology and minerals, including the Plomosa 9 placer claim mine. Because the success of mine reclamation largely depends on reuse of stockpiled or live-handled topsoil, and because all mines are required to implement a SWPPP, impacts to soils beyond initial disturbance and relocation (e.g., soil loss through erosion) are minimized. When combined with past, present, and reasonably foreseeable projects, there would be negligible to minor cumulative effects to soils.

Copper Bottom Zone
Potential cumulative impacts to soils in this zone would be from the same projects as described under geology and minerals, including the Ehrenberg Wash Pit and the West Port Gold Project. Because the success of mine reclamation largely depends on reuse of stockpiled or live-handled topsoil, and because all mines are required to implement a SWPPP, impacts to soils beyond initial disturbance and relocation (e.g., soil loss through erosion) are minimized. When combined with past, present, and reasonably foreseeable projects, there would be negligible to minor cumulative effects to soils.

Colorado River and California Zone
Potential cumulative impacts to soils in the Colorado River and California Zone would be from the same projects as described under geology and minerals. The Project itself would have a negligible to minor impact on sand transport, as there would be only a few structures in the sand area. However, when combined with past, present, and reasonably foreseeable projects, such as the solar facilities, these could have a minor to major cumulative effect on the transport of sand.

4.3.12 Irreversible and Irretrievable Commitment of Resources

Because subsurface resources would not be affected by the Project and because the Project could be decommissioned and removed, no Project impacts to mineral or geological resources would be considered to be irreversible.

Because transmission lines typically have little impact to mining operations, no Project impacts to mineral or geological resources would be considered to be irretrievable.

Environmental impacts that have irreversible negative effects on soil resources are situations where vegetation and topsoils are impacted and not restored. In most cases, reclamation efforts would be made, and irreversible impacts to the soil resources and associated vegetation would be minor, including unavoidable adverse impacts and residual impacts discussed above. However, because soils in desert environments can be slow to recover, these minor impacts could be long term.

4.3.13 Relationship of Short-term Uses and Long-term Productivity

The transmission line may need to be locally re-routed to accommodate surface mining. However, this is only considered an adverse impact (1) in areas defined as mining districts and (2) only in specific locations within mining districts that are active or would have become active. Because there are no active mines that would be impacted by the Project, the short-term loss of productivity would be minor if and when mining begins in those areas. There would be no long-term loss of productivity.

The productivity or function of soil resources would be affected by both short-term or temporary impacts and long-term or permanent impacts. Temporary impacts to soil resources would be present until reclamation is conducted. Following reclamation, temporary impact effects would be alleviated to the soil resources given the suitable climate conditions. Desert environments are typically slow to recover following disturbance unless adequate precipitation is received. Relative to temporary impacts, permanent loss of soil resources would be minimal in spatial scale.

4.4 PALEONTOLOGICAL RESOURCES

4.4.1 Introduction

Concerns regarding paleontological resources consist of the loss of scientifically important fossils or loss of access to scientifically important fossils from the analysis area; however, encountering previously unknown fossil localities during construction may contribute to scientific knowledge. Scientifically important fossils are generally defined as vertebrate fossils, but may also include uncommon plant and invertebrate fossils (BLM 2008f; Society of Vertebrate Paleontology 2010). Assessing the likelihood of encountering important fossils is conducted by using the BLM's PFYC system of predicting the sensitivity of a geological unit. Impacts are primarily assessed based on disturbance to geological units with a PFYC of 3 (moderate potential), 4 (high potential), and 5 (very high potential) or U (unknown potential).

4.4.2 Methods for Analysis

4.4.2.1 Analysis Area

The analysis area for paleontological resources is the 200-foot ROW for all of the Action Alternatives plus ancillary Project components resulting in new surface disturbance located outside the ROW.

4.4.2.2 Assumptions

The analysis was conducted under the following assumptions:

- The literature review and BLM PFYC is sufficient to characterize the fossil-bearing potential within the analysis area; and
- Because ground disturbance would result in the loss of or damage to paleontological resources if present, all direct impacts are permanent and long term.

Additionally, the analysis assumes that all design features, APMs, and BMPs would be implemented (Appendix 2A).

4.4.2.3 Environmental Effect Indicators, Magnitude, and Duration

The following indicators were considered when analyzing potential impacts to paleontological resources:

- Known paleontological resources; and

- Proximity to formations with potential to contain paleontological resources

The magnitudes and durations used to describe impacts to paleontological resources are the same as those provided in Section 4.1.2.

4.4.3 No Action Alternative

Under the No Action Alternative, no ROW would be granted for the Project and the transmission line, SCS, and ancillary facilities would not be constructed. The Project Area would remain undisturbed unless unrelated actions occur.

4.4.4 Construction of Action Alternative Segments

4.4.4.1 Direct and Indirect Effects Common to All Action Alternatives

Direct effects due to construction activities common to all Action Alternatives include possible damage to paleontological resources and possible loss of associated data. The scientific information provided by fossils is maximized by discovery of fossil specimens preserved in place within the host geologic formations. Construction disturbance activities could result in the discovery of fossil specimens. While some fossils may be damaged during construction, they may otherwise remain undiscovered. Construction could have direct negative (i.e., damage) and positive (i.e., discovery) effects on paleontological resources.

Construction impacts include excavations for the structure foundations and construction of access roads, the SCS, and other temporary use sites. Blasting may be necessary in bedrock areas not suitable for excavation by standard augering. The construction impacts from installation of other features would likely be less than the impacts from the structure excavations because other ground-disturbing activities would be much shallower.

Direct impacts to paleontological resources during construction have the potential to occur during ground disturbance in areas with moderate or unknown sensitivity to high sensitivity. The severity of the disturbance to areas with moderate to high sensitivity would vary by alternative. Loss of access to paleontological resources during construction activities only would be the primary potential indirect impact; however, access restrictions would vary by alternative and are anticipated to be negligible and short-term.

If scientifically significant fossils are encountered during construction, construction activities would be temporarily diverted away from the discovery and the authorized officer of the BLM would be notified. BLM would then implement the appropriate measures to avoid, protect, and/or recover the fossil remains as stated in the Paleontological Resources Treatment Plan included as part of the POD.

Assessment and mitigation of adverse effects to paleontological resources would be conducted according to the Project's Paleontological Resource Monitoring and Discovery Plan and Treatment Plan (Appendix 2B), which would comply with the Paleontological Resources Preservation Act (P.L. 111-11, Title VI, Subtitle D).The BLM's management of paleontological resources is further directed through various BLM documents including Manual H-8270-1, "General Procedural Guidance for Paleontological Resource Management" (BLM 1998), IM 2016-124, IM 2009-011, and IM 2008-009. According to the manual, mitigation may involve but is not limited to avoidance or collection of fossils or samples of fossil with curation. Other mitigation could include education of construction and maintenance workers, covering fossil-bearing formations with sediment, and monitoring during construction.

4.4.4.2 East Plains and Kofa Zone

Direct and Indirect Effects Common to All Segments in the Zone

Geologic units of low to unknown paleontological sensitivity (Table 3.4-1) would be crossed by many of the segments in this zone. Therefore, construction of the transmission line, along with associated access roads, has the potential to impact paleontological resources in the East Plains and Kofa Zone. Because all ground disturbance can result in the loss of scientifically valuable fossils if present, temporary and permanent ground disturbance are both considered long-term impacts. Indirect effects due to construction activities include the unauthorized collecting or destruction of paleontological specimens due to increased access. However, with implementation of all design features, APMs, and BMPs (Section 2.2.10 and Appendix 2A), impacts to paleontological resources in the East Plains and Kofa Zone would be negligible to minor and long term.

Direct and Indirect Segment-specific Effects

Based on the PFYC (Table 4.4-1; Appendix 1, Figure 3.4-1), Segments p-01, p-03, p-04, p-05, p-06, d-01, i-02, i-03, i-04, in-01, and x-04 have unknown or high potential to contain fossils in the East Plains and Kofa Zone. The remaining segments have low to very low potential to contain fossils.

Table 4.4-1 PFYC by Segment in the East Plains and Kofa Zone

SEGMENT	PFYC	FOSSIL POTENTIAL
p-01	PFYC 2, U	Low to Unknown
p-02	PFYC 2	Low
p-03	PFYC/2, U	Low to Unknown
p-04	PFYC 2, U	Low to Unknown
p-05	PFYC 1, U	Very low to unknown
p-06	PFYC 1, 4, U	Very low, unknown, and high
d-01	PFYC 2, U	Low to unknown
i-01	PFYC 2	Low
i-02	PFYC 2, U	Low to unknown
i-03	PFYC 2, U	Low to unknown
i-04	PFYC 1, U	Very low to unknown
in-01	PFYC 1, U	Very low to unknown
x-01	PFYC 2	Low
x-02a	PFYC 2	Low
x-02b	PFYC 2	Low
x-03	PFYC 2	Low
x-04	PFYC/2, U	Low to unknown

4.4.4.3 Quartzsite Zone

Direct and Indirect Effects Common to All Segments in the Zone

Geologic units of low to unknown paleontological sensitivity (Table 3.4-1) would be crossed by all of the segments in this zone. Therefore, construction of the transmission line, along with associated access roads, has the potential to impact paleontological resources in the Quartzsite Zone. Because all ground disturbance can result in the loss of scientifically valuable fossils if present, temporary and permanent ground disturbance are both considered long-term impacts. Indirect effects due to construction activities include the unauthorized collecting or destruction of paleontological specimens due to increased access. However, with implementation of all design features, APMs, and BMPs (Appendix 2A), impacts to paleontological resources in the Quartzsite Zone would be negligible to minor and long term.

Direct and Indirect Segment-specific Effects

Based on the PFYC (Table 4.4-2; Appendix 1, Figure 3.4-1), all of the segments in the Quartzsite Zone have unknown potential to contain fossils.

Table 4.4-2 PFYC by Segment in the Quartzsite Zone

SEGMENT	PFYC	FOSSIL POTENTIAL
p-07	PFYC U	Unknown
p-08	PFYC U	Unknown
i-05	PFYC U	Unknown
qn-01	PFYC U	Unknown
qn-02	PFYC 1, U	Very low to unknown
qs-01	PFYC U	Unknown
qs-02	PFYC 1, U	Very low to unknown
x-05	PFYC 1, U	Very low to unknown
x-06	PFYC U	Unknown
x-07	PFYC U	Unknown

4.4.4.4 Copper Bottom Zone

Direct and Indirect Effects Common to All Segments in the Zone

Geologic units of low to unknown paleontological sensitivity (Table 3.4-1) would be crossed by many of the segments in this zone. Therefore, construction of the transmission line, along with associated access roads, has the potential to impact paleontological resources in the Copper Bottom Zone. Because all ground disturbance can result in the loss of scientifically valuable fossils if present, temporary and permanent ground disturbance are both considered long-term impacts. Indirect effects due to construction activities include the unauthorized collecting or destruction of paleontological specimens due to increased access. However, with implementation of all design features, APMs, and BMPs (Appendix 2A), impacts to paleontological resources in the Copper Bottom Zone would be negligible to minor and long term.

Direct and Indirect Segment-specific Effects

Based on the PFYC (Table 4.4-3; Appendix 1, Figure 3.4-1), Segments p-09 and p-10 have high potential to contain fossils. The majority of the other segments in the Copper Bottom Zone have very low to unknown fossil potential.

Table 4.4-3 PFYC by Segment in the Copper Bottom Zone

SEGMENT	PFYC	FOSSIL POTENTIAL
p-09	PFYC U	High to unknown
p-10	PFYC 1, 4	Very low to high
p-11	PFYC 1	Very low
p-12	PFYC 1, U	Very low to unknown
p-13	PFYC U	Unknown
p-14	PFYC U	Unknown
cb-01	PFYC 1	Very low
cb-02	PFYC 1	Very low
cb-03	PFYC 1	Very low
cb-04	PFYC 1, U	Very low to unknown
cb-05	PFYC U	Unknown
cb-06	PFYC U	Unknown
i-06	PFYC 1, U	Very low to unknown
i-07	PFYC U	Unknown
x-08	PFYC 1, U	Very low to unknown

4.4.4.5 Colorado River and California Zone

Direct and Indirect Effects Common to All Segments in the Zone

Geologic units of low to very high and unknown paleontological sensitivity (Table 3.4-1) would be crossed by the segments in this zone. Therefore, construction of the transmission line, along with associated access roads, has the potential to impact paleontological resources in the Colorado River and California Zone. Because all ground disturbance can result in the loss of scientifically valuable fossils if present, temporary and permanent ground disturbance are both considered long-term impacts. Indirect effects due to construction include the unauthorized collecting or destruction of paleontological specimens due to increased access. However, with implementation of all design features, APMs, and BMPs (Appendix 2A), impacts to paleontological resources in the Colorado River and California Zone would be negligible to minor and long term.

Direct and Indirect Segment-specifics Effects

Based on the PFYC (Table 4.4-4; Appendix 1, Figure 3.4-1), Segments p-16, p-18, ca-02, ca-06, ca-07, x-15, and x-16 have high potential to contain fossils. These segments either cross or are along the edge of the Palo Verde Mesa that consists of Pleistocene Marine and Non-marine Sedimentary Rocks (Appendix 1, Figure 3.3-2c). All of the other segments in the zone have unknown potential to contain fossils.

Table 4.4-4 PFYC by Segment in the Colorado River and California Zone

SEGMENT	PFYC	FOSSIL POTENTIAL
p-15e	PFYC U	Unknown
p-15w	PFYC U	Unknown
p-16	PFYC 4, U	High to unknown
p-17	PFYC U	Unknown
p-18	PFYC 4, U	High to unknown
ca-01	PFYC U	Unknown
ca-02	PFCY 4, U	High to unknown
ca-04	PFYC U	Unknown
ca-05	PFYC U	Unknown
ca-06	PFYC 4, U	High to unknown
ca-07	PFYC4, U	High to unknown
ca-09	PFYC U	Unknown
cb-10	PFYC U	Unknown
i-08s	PFYC 2, U	Low to unknown
x-09	PFYC U	Unknown
x-10	PFYC U	Unknown
x-11	PFYC U	Unknown
x-12	PFYC U	Unknown
x-13	PFYC U	Unknown
x-15	PFYC 4, U	High to unknown
x-16	PFYC 4, U	High to unknown
x-19	PFYC U	Unknown

4.4.5 Operations, Maintenance, and Decommissioning

No direct effects to paleontological resources due to operations would be anticipated. Possible indirect effects would be the unauthorized collecting or destruction of paleontological specimens due to increased access. Potential effects due to maintenance activities would only occur if new structures need to be constructed and paleontological resources were impacted, which is a low potential.

Very limited effects due to decommissioning would be anticipated because the activities would occur within the same footprint as construction. Assuming that concrete footings would not be removed from the ground, only exposed outcrops could be affected. It is possible that a few fossils exposed at the surface could be damaged by vehicles involved in decommissioning. Impacts during operations, maintenance, and decommissioning would be negligible and long term.

4.4.6 Mitigation Measures

There are no MMs identified for paleontological resources for any of the specific segments and thus, no MMs have been identified for any of the full route alternatives or subalternatives described below. However, the applicant has committed to APMs, and the BLM developed required BMPs that would further reduce impacts to paleontological resources (Appendix 2A).

4.4.7 Construction of Full Route Alternative and Subalternative Effects

4.4.7.1 Proposed Action

A portion of the Proposed Action would cross an area (Segment p-16) with high to very high potential to encounter fossils. Further, the majority of the route would cross land with moderate to unknown fossil potential. Direct loss of scientifically important fossils and indirect loss of access to scientifically important fossils could occur if fossils are present. Construction within the ROW would include clearing and grading and the excavation for the structure foundations. Grading or shallow excavations in the uppermost layers of soil and younger Quaternary and Tertiary deposits in the Project Area are unlikely to discover significant vertebrate fossils. Following the BMPs in Appendix 2A, if vertebrate or noteworthy occurrences of invertebrate or uncommon plant fossils are discovered, the user/operator shall suspend all operations that further disturb such materials and immediately contact the authorized officer. Work in the area shall not resume until written authorization to proceed is issued by the authorized officer. Within five working days, the authorized officer shall evaluate the discovery and inform the operator of actions that would be necessary to prevent loss of significant scientific values. Upon verification from the authorized officer that the required mitigation has been completed, the operator shall be allowed to resume operations.

If APMs and BMPs (Appendix 2A) are implemented, impacts to paleontological resources would be negligible to minor and long term.

4.4.7.2 Alternative 1: I-10 Route

Impacts to paleontological resources would be similar as described for the Proposed Action, as Alternative 1 includes two segments (i-06 and ca-06) with high to very high potential for fossils. If APMs and BMPs (Appendix 2A) are implemented, impacts to paleontological resources would be negligible to minor and long term.

<u>Subalternatives to Alternative 1 (1A through 1E)</u>

There would not be any differences in effects to paleontological resources between the Alternative 1 subalternatives (1A through 1E) and Alternative 1, as the subalternatives pass through the same PFYCs as Alternative 1.

4.4.7.3 Alternative 2: BLM Utility Corridor Route

Impacts to paleontological resources would be similar but potentially increased from those described for the Proposed Action, as Alternative 2 includes three segments (p-16, x-15, x-16) with high to very high potential for fossils, increasing the likelihood of encountering fossils. However, if APMs and BMPs (Appendix 2A) are implemented, impacts to paleontological resources would also be negligible to minor and long term.

<u>Subalternatives to Alternative 2 (2A through 2E)</u>

There would similar effects to paleontological resources between the Alternative 2 subalternatives (2A through 2E) and Alternative 2, as the subalternatives pass through the same PFYCs as Alternative 2. Under Subalternative 2E, segment ca-02 passes through an area with high to very high potential for fossils, similar to Segment p-16 (Alternative 2); this alternative would not use x-16, but would still use x-15.

4.4.7.4 Alternative 3: Avoidance Route

Impacts to paleontological resources would be similar as described for the Proposed Action, as Alternative 3 includes one segment (ca-06) with high to very high potential for fossils. It would also be similar to Alternative 1, but have less potential impacts than Alternative 2. If APMs and BMPs (Appendix 2A) are implemented, impacts to paleontological resources would be negligible to minor and long term.

Subalternatives to Alternative 3 (3A through 3M)

The only subalternatives that would have differences in effects to paleontological resources from Alternative 3 are Subalternative 3L and 3H because it would require use of 3L. Subalternative 3L would utilize Segment i-06, rather than p-09; therefore, potential impacts to paleontological resources would be less.

4.4.7.5 Alternative 4: Public Lands Emphasis Route

Impacts to paleontological resources would be similar as described for the Proposed Action, and the same as Alternative 3 as it includes the same segment (ca-06) with high to very high potential for fossils. It would also be similar to Alternative 1 but have less potential impacts than Alternative 2. If APMs and BMPs (Appendix 2A) are implemented, impacts to paleontological resources would be negligible to minor and long term.

Subalternatives to Alternative 4 (4A through 4P)

The only subalternative that would have differences in effects to paleontological resources from Alternative 4 is Subalternative 4P that utilizes Segment p-16 rather than ca-06 under Alternative 4. However, as both of these segments cross land with high to very high fossil potential, the difference is likely negligible.

4.4.8 Residual Impacts

Awareness during subsurface excavations in the Project Area is recommended, but monitoring should not be required. Any fossils discovered should be professionally recovered without impeding development. Any fossils recovered during mitigation should be deposited in a permanent scientific institution (e.g., Arizona Museum of Natural History [AZMNH]) for the benefit of current and future generations. No residual effects are anticipated to occur.

4.4.9 CDCA Plan Compliance

CMAs LUPA-PALEO-1 and LUPA-PALEO-2 would apply to the Project (Appendix 2C), and would be satisfied by information provided in Section 3.4.3.1 and Section 3.4.1.1, respectively. LUPA-PALEO-3 and LUPA-PALEO-4 would also apply to the Project (Appendix 2C). The Project would comply with these CMAs through APM-PALEO-01 and BMP-PALEO-02 (Appendix 2A).

4.4.10 Unavoidable Adverse Effects

No unavoidable adverse impacts would occur.

4.4.11 Cumulative Effects

The CEA for paleontological resources is the general 2-mile CEA (711,570.7 acres) described in Section 3.20.

Paleontological resources are subject to cumulative impacts via loss through both natural processes of erosion and weathering, and man-made disturbances. Cumulative effects to paleontological resources occur through the incremental degradation of the resources from various impacts, which reduce the information and scientific research potential of the resources. Natural processes such as soil erosion and rock weathering have exposed fossils.

As presented in Section 3.3 (Geology, Minerals, and Soils), there are past mining operations, prospects, and claims within or near the CEA. As noted in Table 3.20-5, there are existing transmission lines, power plants, solar facilities, natural gas pipelines, and an active rock and aggregate operation in the CEA. All of these endeavors include ground disturbing activities related to exploration, development, and extraction that could encounter paleontological resources. Further, roads, power lines, pipelines, utility construction, and residential development can impact near surface deposits of paleontological resources in general and possibly deeper deposits in areas that required excavation through landforms.

Vertebrate fossils such as dinosaurs, mammals, fishes, reptiles, and uncommon invertebrate and plant fossils are collected by trained researchers under BLM permit. These remain public property and are placed in museums or other public institutions after they are studied. Although the resources are removed from their original context, the documentation adds to the body of knowledge about paleontological resources in the region. However, casual use and un-permitted collection of fossils has contributed to the loss of the resource and its research potential and interpretation.

Types of reasonably foreseeable future projects (Table 3.20-6) include transmission lines, solar facilities, natural gas power plants, mining operations, and road development and improvements. Cumulative impacts to paleontological resources are only expected for projects or phases of projects with ground disturbance where fossils are present. If no ground disturbance is expected or no fossils are present, there would be no direct cumulative effects. The reasonably foreseeable future ground disturbing actions applicable to the CEA all have the potential to impact paleontological resources. However, as 69 percent (491,717 acres) of the land in the CEA is Federally administered and 8.7 percent is state trust lands (62,188 acres), projects on these lands would be subject to NEPA and Federal and state regulations protecting paleontological resources. BMPs appropriate to each project would reduce or minimize impacts to paleontological resources and therefore would also minimize cumulative effects. Any future mining development on public lands would require an inventory of paleontological resources, as well as documentation or collection of specimens uncovered during operations.

Geological formations with exposures containing paleontological resources would continue to be impacted by natural agents (e.g., erosion, rock weathering, surface water drainage).

Encountering paleontological resources during development/disturbance has the potential to destroy and/or lose the resource. However, it also has the potential of providing additional data and rare or previously unknown specimens which can further scientific knowledge. Additional impacts to paleontological resources in conjunction with the Project would not be known until discovered and evaluated. Impacts to paleontological resources associated with Federal land management decisions/actions would be minimized or reduced in accordance with Federal legislation and existing standard operating procedures. Cumulative impacts to paleontological resources would be negligible to minor.

4.4.11.1 Zone-Specific Cumulative Effects

East Plains and Kofa Zone

Approximately 72 percent of the East Plains and Kofa Zone is under Federal management (Table 3.20-3a), therefore projects and activities on these lands would be subject to NEPA and Federal and state regulations protecting paleontological resources. Continued operations at the existing Plomosa Mine Quarry would require documentation or collection of specimens uncovered during operations if paleontological resources were encountered. Cumulative impacts to paleontological resources in this zone would be negligible to minor as paleontological inventory, monitoring, recordation, evaluation, and data recovery would minimize impacts.

Quartzsite Zone

With 94 percent of the Quartzsite Zone under Federal management (Table 3.20-3a), the majority of projects and activities in this zone would be subject to NEPA and Federal and state regulations protecting paleontological resources. Ground disturbing activities associated with reasonably foreseeable projects such as the Plomosa 9 Placer Claim, the Quartzsite Solar Energy Project, and the Quartzsite Wastewater Treatment Plant renovations could encounter paleontological resources. Cumulative impacts to paleontological resources in this zone would be negligible to minor as paleontological inventory, monitoring, recordation, evaluation, and data recovery would minimize impacts.

Copper Bottom Zone

More than 82 percent of the Copper Bottom Zone is under Federal management (Table 3.20-3a), therefore projects and activities on these lands would be subject to NEPA and Federal and state regulations protecting paleontological resources. Continued operations at the existing Ehrenberg Quarry and future activities at the West Port Gold Mine would require documentation or collection of specimens uncovered during operations. Cumulative impacts to paleontological resources in this zone would be negligible to minor as paleontological inventory, monitoring, recordation, evaluation, and data recovery would minimize impacts.

Colorado River and California Zone

The majority of lands (68.6 percent) in the Colorado River and California Zone are under private ownership (Table 3.20-3a); therefore, this area has the least amount of Federal protection for paleontological resources. However, most proposals for physical development in California are subject to the provisions of CEQA; as any development project that requires a discretionary governmental approval requires at least some environmental review pursuant to CEQA.

Cumulative impacts to paleontological resources in this zone would be negligible to minor as paleontological inventory, monitoring, recordation, evaluation, and data recovery would minimize impacts.

4.4.12 Irreversible and Irretrievable Commitment of Resources

Although fossils are a finite and nonrenewable resource, provided that all MMs are followed there are no irreversible or irretrievable commitments of resources.

4.4.13 Relationship of Short-term Uses and Long-term Productivity

Construction of the Project would result in ground disturbance during construction. Ground disturbance that results in the loss of scientifically important fossils is considered a long-term impact.

During construction, the removal of fossils from areas of moderate or high sensitivity would alter the long-term productivity of those fossil sources because fossils are a finite and nonrenewable resource. However, the discovery and removal of previously unknown fossils can contribute to long-term productivity as well by: (1) allowing those fossils to be studied by the scientific community; and (2) potentially revealing new fossil beds for later research.

Loss of access to resources during construction would be reversed once construction was complete. However, any permanent facilities constructed on areas with moderate or high sensitivity would restrict access until the line is decommissioned.

4.5 BIOLOGICAL RESOURCES

4.5.1 Introduction

The impacts described in this section are based on the data presented in Chapter 3 and are discussed in terms of impacts on vegetation communities, wildlife species, special status species of plants and animals and their habitats, special habitat management areas, and noxious weeds.

4.5.2 Methods for Analysis

4.5.2.1 Analysis Area

The analysis area for the purpose of evaluating impacts to biological resources includes the 200-foot-wide ROW for all of the Action Alternatives plus ancillary Project components that would result in new surface disturbance outside of the ROW. This area is used to identify resources that could be directly impacted by ground disturbance and where construction materials, equipment, and workers may be present. This analysis area is sufficient to identify vegetation communities and wildlife habitat that could be directly impacted by ground disturbance during construction, operation, maintenance, and decommissioning of the proposed line.

4.5.2.2 Assumptions

For this analysis of potential impacts to biological resources, it is assumed that the APMs and BMPs included as part of the Proposed Action and all of the Action Alternatives would be fully implemented to avoid, minimize, or mitigate impacts to biological resources. In the following analysis of Project-related impacts, the applications of these specific measures, as detailed in Appendix 2A, Section 2A.4, may be referenced by resource category and number (e.g., APM/BMP-BIO-#).

4.5.2.3 Environmental Effect Indicators, Magnitude, and Duration

Indicators used to assess Project-related impacts due to construction, operation, maintenance, or decommissioning of the Project include:

- Loss of natural, native species dominated vegetation communities or associations;
- Loss or degradation of aquatic, wetland, or riparian habitats caused by reduction in water quality, diversion of water sources, erosion or sedimentation from altered drainage patterns, or chemical contamination;
- Loss or degradation of terrestrial habitats due to clearing of vegetation, increased soil erosion, alteration in sand deposition, or introduction of invasive non-native plants;
- Loss of or impacts to rare vegetation communities or habitats that have a special designation by a Federal, state, or local agency;
- Introduction or increased spread of noxious weeds and other invasive exotic weed species;
- Loss of native vegetation communities, plants, and wildlife due to increased risk of wildfire from the spread of invasive and noxious weed species;
- Increased risk of collision of migratory birds due to presence of transmission line and associated structures;
- Increased risk of predation resulting from subsidized predator populations (increased food availability) or due to presence of transmission-related structures (perches and hiding structures);
- Loss of individuals or habitat of a plant or animal species that has been designated as special status by a Federal, state, or local agency;
- Displacement of, or disturbance to wildlife species due to noise and human activity associated with Project activities;
- Disturbance to wildlife from increased recreational access to remote areas accommodated by Project features;
- Increased risk of mortality to wildlife due to vehicle use and construction activities;
- Impacts to special designated management areas (e.g., wilderness area, habitat management area, ACEC, wildlife refuge); and
- Habitat fragmentation, including a decrease in function of wildlife corridors, due to Project features.

- Lack of compliance with Federal or state statutes or policies.

Impact analyses are discussed in terms of direct effects (occurring at the same time and place that the action is performed) and indirect effects (occurring later in time or farther from the initial action); and duration of impacts: short term (construction period up to 2 years), long term (greater than 2 years but less than 50 years), or permanent (continues for the 50-year life of the Project). Note that Section 4.1.2 defines short-term impacts as those that may last for up 10 years; however, the DRECP defines short-term impacts as up to 2 years, which is the timeframe used for this analysis of Biological Resources. Cumulative effects—impacts added to the impacts of past, present, and foreseeable future actions, regardless of the cause or source of other impacts—are also evaluated.

4.5.3 No Action Alternative

Under the No Action Alternative, no ROW would be granted for the Project and the transmission line, SCS, and ancillary facilities would not be constructed. Current biological resource conditions in the analysis area would continue under the No Action Alternative. Biological resources would not be altered beyond current conditions. The Project Area would remain undisturbed unless unrelated actions occur.

4.5.4 Construction of Action Alternative Segments

4.5.4.1 Direct and Indirect Effects Common to All Action Alternatives

Project construction and related activities associated with all Action Alternatives could result in temporary damage to and/or permanent loss of vegetation, habitat loss and mortality of general wildlife species, and temporary disturbance to and/or loss of individuals or habitats of special status plant and animal species. Other potential impacts include disruption of wildlife movements and impacts to designated wildlife management areas including loss of habitat due to the footprints of tower structures and access roads (e.g., USFWS wildlife refuge and BLM WHMAs). Temporary disturbance includes short-term impacts (less than 2 years) associated with construction, such as noise and the presence of construction workers.

Given that restoration of desert habitats following vegetation removal and disturbance of surface soils takes many years, for purposes of analysis of impacts to biological resources, all ground disturbance is considered long term, which also includes all loss of habitat associated with permanent Project features (e.g., new transmission structures, SCS, access roads) that would remain throughout the life of the Project (i.e., 50 years). For analysis purposes, it is assumed that each structure would impact 1.1 acres during construction, though more than 90 percent of ground disturbance associated with structures is expected to be reclaimed, as required by the BLM under the Reclamation and Restoration Plan (to be completed before NTP issued) (APM/BMP-BIO-15; Appendix 2A, Section 2A.4). The plan would specify processes for reclamation with the goal of restoration.

Tables in each zone provide acres of long-term disturbance associated with each route segment (this is the combined acres of temporary and permanent disturbance reported in Chapter 2, less the acres of permanent structure foundations that were included as a subset of temporary disturbance[1]), length of the line segment in miles, number of structures associated with each segment. The long-term disturbance acreages estimate the generalized disturbance to wildlife and habitat along each segment.

<u>Vegetation Communities</u>

The Project would involve the removal of vegetation during construction activities, resulting in the direct reduction in the representation of plant communities. Vegetation removal and disturbance of soils could have a variety of effects on vegetation communities, ranging from changes in community structure and species composition to alteration of soil moisture or nutrient regimes. Removal of protective vegetation would also expose soil to potential wind and water erosion. This could result in further loss of soil and vegetation, as well as increased sediment input to water resources.

Fugitive dust from construction traffic has the potential to affect photosynthetic rates and decrease plant productivity. Clearing and grading could also result in the alteration of soil conditions, including the loss of native seed banks, and change the topography and drainage of a site such that the capability of the habitat to support native vegetation is impaired.

Though portions of each alternative pass through developed agricultural areas at the east and west ends of the Project, the majority of each alternative is within the Sonoran desertscrub biotic community. Trimming or removal of tall vegetation for conductor clearance would alter some of the more robust plants within the vegetation community and can leave these plants more susceptible to disease and possibly result in the death of those plants. The vegetation communities and plant associations within the Sonoran Desert are very slow to re-grow perennial species following disturbance, often taking decades to recover, if at all. These disturbed lands are highly susceptible to colonization and expansion of invasive annual plant species (especially red brome and Sahara mustard). The introduction and colonization of disturbed areas by invasive exotic plant species also could lead to changes in species composition of vegetation communities, including the possible shift to more wildfire-prone vegetation that favors invasive exotic species over native species.

Project activities associated with all Action Alternatives that would result in ground disturbance and loss of native vegetation include:

- Clearing and grading structure sites (three to eight structures per mile, approximately 1.1 acres of ground disturbance at each site);
- Widened existing access to a maximum of 18 feet for travel surface with up to 30 feet of total disturbance overall to accommodate construction equipment;

[1] Appendix 2, Section 2.2.9 specifies that the concrete foundations would be broken off at least 2 feet bgs. Reclamation and restoration of these areas would begin after removal of the foundations, which is anticipated to be after the 50-year lifespan of the Project. During the life of the Project, these areas would not be reclaimed, and therefore, for analysis purposes, these areas are considered permanent rather than long-term disturbance.

- Clearing and grading to establish new roads within the ROW to a width of 16 to 22 feet of travel surface, with 2-foot berms on either side where no access road exists;
- Clearing and grading new spur roads would range from 16 to 22 feet wide with two 2-foot berms on either side from existing roads to structure sites;
- Driving on and crushing vegetation where vegetation removal is not needed based on topography;
- Constructing temporary roads to a width of 16 to 22 feet for access to storage areas and pull sites;
- Clearing for temporary use areas including staging areas (approximately 24 acres disturbance every 20 miles), helicopter fly yards (33.4 acres within three fly yards; additional alternative fly yard of 43.5 acres), pull sites (approximately 2.5 acres disturbance every 5 miles) and snub sites (approximately 1.1 acres disturbance every 5 miles);
- Clearing for permanent SCS (total disturbance 1.7 acres);
- Site preparation for APS 12kV distribution line to the SCS;
- Invasion and spread of nonnative plants in areas of soil disturbance; and
- Trimming or removing tall vegetation such as saguaro cactus, ironwood, and paloverde growing under and adjacent to the path of the conductors to avoid flash over.

Project implementation would have direct and indirect impacts on vegetation resources located within areas disturbed by construction activity; however, these potential impacts would be minimized through implementation of various APMs and BMPs (Appendix 2A, Section 2A.4) and include:

- An environmental awareness program would be provided to alert construction workers, with non-English interpretation as needed, on how to minimize impacts to vegetation resources (APM-BIO-01);
- Preconstruction surveys and on-site monitoring to identify the presence of environmentally sensitive areas, including sensitive vegetation communities such as riparian and xeroriparian washes, and to establish specific work areas to contain Project activities (APM/BMP-BIO-02, APM/BMP-BIO-03, APM-BIO-04, APM-BIO-13);
- Dust and erosion would be controlled through implementation of a Project-specific SWPPP. Use dead and downed wood, as appropriate, to reduce soil erosion. Minimize surface water runoff, erosion, sedimentation, and altered hydrology (APM-BIO-10, BMP-BIO-42, BMP-BIO-50, APM-WQ-01);
- An Erosion, Dust, and Air Quality Plan would include information about the reduction of dust emissions generated from helicopter use;
- A BLM approved Vegetation Management Plan would be implemented to guide plant surveys, preparation of maps delineating special vegetation features within disturbance zones, plant salvage requirements, stumpage fee determinations, use of pesticides, and vegetation pruning and control (APM/BMP-BIO-11, APM-BIO-26, BMP-BIO-37, BMP-BIO-41, BMP-BIO-43, BMP-BIO-51);

- In accordance with the required Vegetation Management Plan (APM/BMP-BIO-11), the need for vegetation trimming would be minimized or eliminated through micrositing and design (e.g., structure height) so the catenary formed by the conductors (bottom of the sag) is not located over tall vegetation such as washes and saguaros. Where tall vegetation cannot be avoided, a wire zone/border zone approach would be applied (Section 2.2.8.2 and Appendix 1, Figure 2.2-9a) to identify where trimming would be required to maintain a minimum clearance of 5.6 feet between conductors and vegetation. The maximum height of vegetation beneath the conductors at maximum sag would be approximately 30.7 feet; desert plants generally have slow growth rates and few plants are expected to exceed this height (possible exception at the Colorado River crossing);
- A BLM approved Noxious Weed Control Plan (see following subsection and Section 2.2.8) would be implemented establishing measures for preconstruction weed surveys, weed control methods, and weed monitoring (APM-BIO-12);
- Minimize site disturbance and soil compaction. Vehicle travel would be limited to established roads, and blading for access roads would be minimized. In construction areas where recontouring is not required, access would be gained by drive and crush, leaving vegetation in place wherever possible to avoid excessive root damage and allow for resprouting (APM-BIO-10, APM-BIO-14, APM-BIO-17, BMP-BIO-38, BMP-BIO-42, BMP-SOIL-01, BMP-VEG-01, BMP-VEG-02);
- A BLM approved Habitat Restoration and Monitoring Plan (Appendix 2B) would be implemented for all disturbed lands. This plan would describe in detail methods for surveying and documenting vegetation conditions prior to construction; plant salvage, storage, and replanting requirements and methods; topsoil salvage and management (Section 2.2.7.2); erosion control; post-construction recontouring and site preparation; seed mixes; seeding and planting techniques; and post-construction monitoring and remediation. Site preparation, and planting and seeding would occur during the construction phase. It is anticipated that restoration would take many years and perhaps repeated planting to achieve success, with the expectation that, for at least some sites, there will always be some evidence of past disturbance (APM-BIO-15, APM-BIO-26, BMP-SOIL-01); and
- Measures would be taken to minimize the loss of saguaro cactus (APM-BIO-16).

Special Status Plant Species

The impacts described for general vegetation apply to special status plant species. No plant species listed under the Federal ESA would be expected to occur in the Project Area; therefore, no impacts to ESA-listed plant species would occur. However, in Arizona more than 200 species protected by the Arizona Native Plant Law, including blue paloverde, foothill paloverde, velvet mesquite, desert ironwood, ocotillo, and various cacti (e.g., saguaro, cholla, barrel, hedgehog, and prickly pear) occur within the Project Area. In California, as many as 16 species considered rare by the CNPS and two plant species considered sensitive by the BLM have the potential to be impacted by Project activities.

Noxious and Invasive Weeds

The inadvertent introduction of non-native plant species is a threat to native desert plant communities. Since noxious and invasive weeds are typically effective competitors with native plants, disturbance of vegetative cover that facilitates their introduction, spread, and proliferation could alter plant community composition, reduce native plant species cover, and alter natural fire regimes. Because these weeds are often fire-adapted, they perpetuate increased fire risk once established. Noxious and invasive weed species of particular concern known to occur in the Project Area include Russian knapweed, diffuse knapweed, Russian thistle, brome grasses, and Sahara mustard.

The Project would remove native vegetation and disturb soils at structure construction sites, storage areas, along access roads, and wherever heavy equipment is used, providing suitable conditions for infestation by non-native plants. An influx of vehicles and machinery for construction of any of the Action Alternatives could facilitate weed introduction and spread into the ROW. Non-native plant seeds or plant parts could be transported on vehicles, construction equipment, or in materials such as dirt, straw bales, and wattles. Enhanced public access to the Project corridor during and after construction could also contribute to the spread of non-native plants. The Noxious Weed Management Plan (Appendix 2B, Section 2B.11) (APM-BIO-12; Appendix 2A, Section 2A.4), to be approved by BLM, would require pre-construction surveys and regular monitoring for invasive and noxious weeds within the ROW, along permanent and temporary access roads, and any other sites where Project activities result in soil disturbance. The plan would include prevention and treatment methods that include cleaning equipment to prevent the spread of noxious weeds into or out of the Project Area. Chemical treatment for control of noxious weeds or invasive species within or adjacent to the ROW would only be applied if absolutely necessary by using only BLM-approved products, limiting applications within floodplains and washes, and conducting all activities in accordance with the Noxious Weed Management Plan (Appendix 2B, Section 2B.11) (Section 2.2.8).

Through Project implementation, direct and indirect impacts would occur to native desert plant communities and special status plants as a result of the spread of noxious and invasive plant species within areas disturbed by construction activity; however, these potential impacts would be minimized through implementation of various APMs and BMPs (Appendix 2A, Section 2A.4) that include:

- A BLM approved Noxious Weed Management Plan would be implemented establishing measures for preconstruction weed surveys, weed control methods, and weed monitoring (APM-BIO-12).

Wildlife

Direct impacts on wildlife anticipated as a result of the Project include the removal of vegetation that would result in the long-term loss of wildlife habitat along with the displacement and/or potential mortality of resident wildlife species, especially those that are less mobile such as snakes, lizards, and small mammals. Clearing and grading would generate the greatest construction impacts on wildlife. Injury or death of wildlife would result primarily from the use of construction vehicles, and the grading of access roads and laydown areas for structure erection. Fossorial species, such as small burrowing animals (e.g., lizards, snakes, and small mammals) may be harmed through the crushing of burrows, the loss of refugia, and direct mortality from construction activities. Various wildlife species could be trapped in holes or trenches created for construction purposes. Though there is little aquatic habitat, amphibians (e.g., Sonoran desert toad and Couch's spadefoot toad) may be present throughout the Project Area and especially near ephemeral washes following rain events, when they may be crushed by construction equipment, or be trapped in water-filled holes at construction sites. Construction could also result in an increase in accidental road-killed wildlife due to increased vehicle traffic along the construction corridor. Diurnally active reptiles (e.g., lizards and some snakes) and mammals (e.g., rabbits and ground squirrels) are the most likely to be subject to mortality from construction vehicles. More mobile species like birds and larger mammals are expected to disperse into adjacent habitat areas during the land clearing and grading phases associated with Project construction.

Removal of vegetation during Project construction would reduce the amount of habitat available for wildlife in a particular area. Individuals displaced from areas cleared of native vegetation could be lost if adjacent habitats are at carrying capacity or if they are exposed to an increased risk of predation.

Construction may also result in fragmentation and degradation of adjacent native habitats due to use of and improvement to existing access roads, disturbance, noise, vibration, dust, increased human presence, and increased vehicle traffic. Use of and improvements to existing roads, and creation of new roads to access construction sites and support long-term Project maintenance, provides opportunities for increased human presence and disturbance to wildlife habitat by recreationists, and especially by OHV enthusiasts.

Construction activities and human presence can alter, displace, or disrupt the breeding and foraging behavior of wildlife. Wildlife species are most vulnerable to construction-related disturbances during their breeding seasons when disturbances could result in nest, roost, or territory abandonment, and subsequent loss of reproductive effort. No known bat roosts or mines occur within the Project ROW; however, bats may use nearby cliffs and crevices for roosting. The use on lights for construction activities during the night may attract insects that could attract foraging bats. Though construction activities are a potential source of disturbance, it is unlikely that roosting areas would be disturbed except perhaps if blasting occurs nearby and bats are temporarily frightened from their roosts.

Local wildlife populations along the ROW could temporarily decline or disperse during the construction phase of the Project, but are expected to return to their pre-construction levels once construction workers leave the area and disturbed habitats are restored. For portions of the Project that would be constructed adjacent to existing roads, most of the wildlife present would be considered common, wide-ranging species already likely habituated to some level of on-going disturbance. Also, since construction is of short duration and limited to relatively small areas within a large expanse of desert habitats, wildlife would likely quickly return to the ROW as work crews move to new work locations. Nocturnally active wildlife would be affected less by construction than would diurnally active species. Construction activities associated with Project implementation would have direct and indirect impacts on general wildlife and fish located within areas disturbed by construction activity; however, these potential impacts would be minimized through implementation of various APMs and BMPs (Appendix 2A, Section 2A.4) that include:

- An environmental awareness program would be provided to alert construction workers of how to minimize impacts to habitats and wildlife (APM-BIO-01);
- Preconstruction surveys would be conducted to identify the presence of environmentally sensitive areas, including sensitive habitats such as riparian and xeroriparian washes, to move wildlife out of harm's way, and to establish specific work areas to contain Project activities (APM-BIO-02, APM/BMP-BIO-03, APM-BIO-04, APM-BIO-13);
- Actions to protect wildlife and fish such as proper disposal of trash and food scraps, exclusion of monofilament plastic, implementation of a SWPPP to preclude sediments from entering waterways and maintain water quality, fuel spill prevention, prohibition of pets at the Project site, avoid ponding of water used in dust control so not to attract wildlife to the work area, control of nighttime lighting, prohibit harm and harassment of wildlife, and providing wildlife escape ramps at holes and trenches would be enforced (APM-BIO-05, APM-BIO-06, APM-BIO-07, APM-BIO-08, APM-BIO-09, APM-BIO-10, BMP-BIO-33, BMP-BIO-34, BMP-BIO-35, BMP-BIO-36);
- Vehicle travel would be limited to established roads, and blading for access roads would be minimized. In construction areas where recontouring is not required, access would be gained by drive and crush, leaving vegetation in place wherever possible to avoid excessive root damage and allow for resprouting (APM-BIO-14, APM-BIO-17);
- A BLM approved Habitat Restoration and Monitoring Plan would be implemented for all disturbed lands (APM-BIO-15);
- All aquatic habitat would be spanned (APM-BIO-19);
- Activities would not be sited within 500 feet of any occupied or presumed occupied bat maternity roost (BMP-BIO-40); and
- Adherence to seasonal wildlife restrictions per the AGFD, CDFW, and/or applicable RMPs (BMP-BIO-32).

Special Status Wildlife Species

Project activities could impact special status wildlife species in much the same way as discussed for common wildlife species. The APMs and BMPs identified for general wildlife would apply to special status wildlife species, minimizing Project-related impacts. These include pre-construction presence/absence surveys would be conducted for special status wildlife species, including nesting migratory birds such as the burrowing owl. Qualified biologists would follow established survey protocols and would conduct the surveys in locations where special status wildlife species are likely to occur within the Project ROW, and specifically locations where vegetation would be impacted. Though this approach should result in locating and moving animals present in construction areas out of harm's way, it is likely individuals of small, fossorial, and cryptic species such as small mammals, snakes, and amphibians would be missed. However, the amount of habitat that would be impacted by Project activities would be small in comparison to available habitat, and the loss of individuals would not impact local populations.

Project construction activities could frighten Sonoran pronghorn if they are in the area. These individuals would move away from construction activities. Because there are large areas of similar habitat for those individuals, and construction activities would occur for a relatively short amount of time, this effect would be negligible.

Mojave Desert Tortoise and Sonoran Desert Tortoise
Two species of desert tortoise occur in the Project Area. The Mojave desert tortoise is found in California and is listed as threatened under the ESA; the Sonoran desert tortoise occurs in Arizona and is managed under a candidate conservation agreement. Though the status and regulatory requirement for each species of tortoise differs, the potential Project-related effects are similar to both species. The Project includes segments that would pass through habitat for each of the tortoise species.

Project-related impacts to desert tortoise are similar to those discussed for less mobile wildlife species that are susceptible to being killed during vegetation removal, crushed in burrows, and run over by construction equipment and vehicles. The desert tortoise is a long-lived species, taking many years to reach reproductive maturity. Micrositing would reduce the effects of the Project on Mojave desert tortoise habitat.

The Project presents other potential threats to both the Mojave desert tortoise and Sonoran desert tortoise. Removal of vegetation and disturbance to soils increases the probability of invasion and spread of non-native plant species, especially annual brome grasses. These non-native plants provide poor quality forage for the desert tortoise and crowd out many native, more nutritious forage species. A proliferation of non-native plants can affect a habitat type conversion destroying native desert communities on which the tortoise depends. Micrositing would reduce the effects of the Project on Mojave desert tortoise habitat.

Common ravens are known to perch and nest on transmission structures, and they are also known to be opportunistic predators of various wildlife species, including juvenile desert tortoises. Severe loss of juvenile tortoises to ravens has been documented in the Mojave Desert, but not in the Sonoran Desert; however, the potential of raven predation is a management concern for the Sonoran desert tortoise as well. Improving existing roads and grading new roads into remote areas can lead to increased recreational access to remote areas and increase the potential for encounters (including illegal collection) between people and tortoises.

Construction activities associated with the Project could have direct and indirect impacts on the Mojave desert tortoise and the Sonoran desert tortoise located within areas disturbed by construction activity; however, these potential impacts would be minimized through implementation of various APMs and BMPs (Appendix 2A, Section 2A.4) that would include:

Sonoran Desert Tortoise

- A qualified biologist would be present during all ground-disturbing activities in non-cultivated areas in Arizona to survey and monitor construction sites for the presence of Sonoran desert tortoises, and move Sonoran desert tortoises out of harm's way. Burrows near construction sites would be clearly delineated and protected to the extent possible (APM-BIO-22).

Mojave Desert Tortoise

- A qualified biologist would be present during all ground-disturbing activities in non-cultivated areas in California to survey and monitor construction sites for the presence of

Mojave desert tortoises, and move Mojave desert tortoises out of harm's way. Burrows near construction sites would be clearly delineated and protected to the extent possible (APM-BIO-23, APM-BIO-25);

- A Raven Management Plan has been prepared and would be implemented to address food and water subsidies, and to avoid providing perches, nesting sites, and roosting sites for the common raven, and provide compensatory mitigation that contributes to LUPA-wide raven management (BMP-BIO-28);
- All culverts for access roads or other barriers would be designed to allow unrestricted access by Mojave desert tortoises, and Mojave desert tortoise exclusion fencing may be utilized to direct Mojave desert tortoise use of culverts and other passages (BMP-BIO-44);
- A designated biologist would accompany any geotechnical testing equipment to ensure no Mojave desert tortoises are killed and no burrows are crushed (BMP-BIO-44);
- The ground would be inspected under vehicles for the presence of Mojave desert tortoise any time a vehicle or construction equipment is parked in Mojave desert tortoise habitat. If the Mojave desert tortoise does not move on its own within 15 minutes, a designated biologist may remove and relocate the animal to a safe location (BMP-BIO-44);
- Vehicular traffic would not exceed 15 mph within the areas not cleared by protocol level surveys where Mojave desert tortoise may be impacted (BMP-BIO-44); and
- Any additional requirements identified in consultation with the USFWS (APM-BIO-23).

<u>Wildlife Corridors, Wildlife Habitat Management Areas, and Wildlife Waters</u>

The BLM has designated several WHMAs and identified Wildlife Movement Corridors within the Arizona portion of the Project Area. These areas are to provide landscape-level connectivity and reduced habitat fragmentation to allow animals (primarily large mammals such as desert bighorn sheep, mule deer, Sonoran pronghorn, mountain lion, coyote, and bobcat) to freely move about, as well as to move from mountain range to mountain range through appropriate habitat. Management objectives for these areas are generally to limit human-caused disturbances and changes in land cover that would inhibit use of these areas by wildlife. All WHMAs allow for transmission-class ROW when confined to designated ROW corridors. AGFD has inventoried wildlife waters where species depend on maintained or natural water sources during dry periods, and vegetation is often more abundant and diverse along the outflows of springs.

The presence of a transmission line, per se, would have little if any impact to animals moving through or using a WHMA or Wildlife Movement Corridor. Native desert habitats include open areas (e.g., desert pavement) and linear features free of vegetation (e.g., wash beds), such that the presence of structure pads and access roads associated with the Project would not create barriers to animal movements. Similarly, the presence of the Project would be unlikely to affect wildlife use of a wildlife water, and no Project structures or access roads would displace a wildlife water. However, during construction, human activity and the presence and use of large construction equipment and the associated noise could deter wildlife from crossing an area or approaching a wildlife water. These impacts would be temporary (several weeks) at each structure site, but would move across the landscape to each new structure location and work site. These impacts would have a reduced effect to nocturnal movements of wildlife after day-time disturbance from construction is halted, though these animals may have previously dispersed from the area.

Important desert bighorn sheep lambing areas in the region include rugged and isolated areas in the Plomosa Mountains, Livingston Hills, and New Water Mountains, within Kofa NWR, and in the Dome Rock Mountains in the area surrounding Copper Bottom Pass. Construction activities in these areas could deter desert bighorn sheep from crossing into favored lambing grounds, keep them from water sources, or may cause them to disperse from the area entirely. Desert bighorn sheep need to move widely across the landscape as habitat conditions may vary dramatically between different locations based on sporadic and localized rainfall. Long-term impacts to the function of WHMAs and wildlife movement corridors, and disturbance to wildlife seeking access to watering sites may result from facilitating access to remote areas for recreational use.

Construction activities associated with Project implementation could have direct and indirect impacts on the use of wildlife corridors by desert bighorn sheep and other wildlife located within areas disturbed by construction activity; however, these potential impacts would be minimized through implementation of various APMs and BMPs (Appendix 2A, Section 2A.4) that include:

- Minimizing the loss of vegetation to retain cover for wildlife moving across the landscape (APM-BIO-10, APM-BIO-14, APM-BIO-17, BMP-BIO-38, BMP-BIO-42, BMP-SOIL-01, BMP-VEG-01, BMP-VEG-02; and in California BMP-BIO-52);
- Controlling the number of trips and the amount of construction equipment within Copper Bottom Pass to minimize disturbance to desert bighorn sheep (APM-BIO-18); and
- Minimizing potential disturbance to desert bighorn sheep lambing areas by restricting Project-related construction activities in desert bighorn sheep lambing areas between January 1 and March 31 (APM-BIO-27).

<u>Migratory Birds and Raptors</u>

The Project Area includes plant communities that provide foraging habitat and nesting sites for migratory birds. Most of the Project Area is Sonoran desertscrub biotic community, with agricultural areas near the east and west ends, and non-native dominated riparian habitat (salt cedar) at the crossing of the Colorado River. Natural rock features such as cliffs and large rock outcrops are present in the Dome Rock Mountains and other nearby ranges. Ground-disturbing activity, including structure pad preparation and grading of new access roads, has the potential to disturb vegetation utilized by wildlife, including nesting birds. With the exception of a few non-native bird species, active nests are fully protected against take for over 800 species of birds pursuant to the MBTA. It is unlawful to take, possess, or destroy the nest or eggs of any such bird. Impacts could occur if trees and/or shrubs were removed that contained an active nest. The removal of habitat or substantial disturbance (e.g., helicopter fly yard activity) during the breeding season would likely result in the displacement of breeding birds and the abandonment of active nests. Burrowing owls may use their burrows throughout the year, where they could be crushed by heavy equipment.

The presence of transmission structures would provide perches as well as nesting sites for some raptor species. In some areas, the transmission line structures may be the only suitable nesting structures allowing some species to utilize areas that would otherwise be unsuitable.

Noise-related construction activities and increased human presence could affect raptor nesting, roosting, and foraging activities; some species such as golden eagles are especially sensitive to disturbance. Changes to behavior could include increased alertness, turning toward the disturbance, fleeing the disturbance, changes in activity patterns, and nest abandonment. Raptors would be especially susceptible to disturbance early in the breeding season, possibly resulting in nest abandonment and failure. Raptors using structures for perches or nesting could be electrocuted; and soaring birds may collide with the transmission line, especially during poor weather conditions and along elevated terrain where soaring raptors would be at greater risk for collisions.

Constant-burn lighting on structures increases collision risk for night migrating birds.

Transmission lines crossing the Colorado River and its historic floodplain are a potential collision hazard for birds following the river corridor, especially during migration. The guyed V structure is one of the primary types of structures to be used for this Project. These structures have a single footing and four support guy wires, and would be between 72 and 190 feet in height (most would be shorter than 130 feet) with three to eight structures per mile. Guy wires are often difficult for birds to detect due to its narrow diameter compared to conductor bundles and are a collision hazard to birds in flight.

Small stands of emergent vegetation are adjacent to the Colorado River and associated backwater channels. Though too small for nesting, Yuma Ridgway's rail or California black rail could occasionally use and forage in these and other stands of emergent vegetation along canals and drains in the agricultural areas.

Though no suitable nesting habitat is within the Project Area for southwestern willow flycatcher or western yellow-billed cuckoo, preconstruction surveys for nesting migratory birds would detect (and protect) these species, if present. No large trees would be removed within the Colorado River corridor, reducing potential impacts to proposed critical habitat for the western yellow-billed cuckoo. (There are no contiguous patches of cotton-wood willow of 200 acres in extent at proposed river crossings, precluding the presence of primary constituent elements.)

The Project has the potential to violate the MBTA and Bald and BGEPA due to removal of nesting habitat during the breeding season, collision, and disturbance. These potential impacts would be minimized through implementation of various APMs and BMPs (Appendix 2A, Section 2A.4) that include:

- An Avian Protection Plan and Bird and Bat Conservation Strategy (APP/BBCS) would be developed that would identify measures for the protection of migratory birds (and bats), would include a nesting bird management plan and nest management plan, and provide for the protection of active golden eagle nests (APM/BMP-BIO-21, BMP-BIO-29, BMP-BIO-45).
- At the Colorado River crossing, which includes the river, floodplain, and associated agricultural lands, conductor bundles would be in a horizontal, parallel configuration, and

match existing structure spacing and conductor heights to the greatest extent practical to reduce the potential for bird collisions with the power line (APM/BMP-BIO-19);

- The minimum number of structures would be located within the undeveloped floodplain of the Colorado River, and guyed structures would not be used at the river crossing (APM/BMP-BIO-19);
- If construction is scheduled during the nesting bird season of February 1 through August 31, surveys would be conducted for active bird nests (including all special status species such as burrowing owl, northern harrier, golden eagle, LeConte's thrasher, and loggerhead shrike) within all disturbance areas, and active nests would be protected by buffers, visual barriers, or other means (APM-BIO-20);
- Aerial marker balls or other visibility markers would be placed on overhead ground wires and other static wires at the Colorado River crossing and floodplain to reduce collisions (BMP-BIO-21);
- Deterrents would be added to reduce nesting and perching by ravens and other predatory birds (BMP-BIO-21);
- Design of the transmission lines, SCS distribution line, and structures would be in accordance with "Reducing Avian Collision with Power Lines" (APLIC 2012) (appropriate to infrastructure size) to minimize the potential for bird collisions with transmission lines or structures (APM-BIO-21);
- The APP/BBCS would include detailed survey protocols and protection measures/relocation procedures for active burrowing owl burrows. In California, a breeding season setback of 656 feet from project activities to active burrows would be applied. Passive burrow exclusion or translocation of burrowing owls would be conducted in coordination with CDFW in California, and AGFD in Arizona (APM-BIO-25, BMP-BIO-30);
- Where long-term nighttime lighting would be required, the light would be shielded and directed downward, and avoid the use of constant burn lighting to minimize collisions and interference with navigation of night-migrating birds (BMP-BIO-33);
- When fencing is necessary, bird compatible design standards would be applied (BMP-BIO-39); and
- Flight diverters would be installed on the Colorado River and associated floodplain crossings and other areas of high bird use (BMP-BIO-48).

<u>Habitat Quality</u>

Though the quantification of the number of acres impacted by Project segments to vegetation communities and species' habitats provide an overall comparison of potential impacts for each segment, they generally do not account for habitat quality. Many factors influence habitat suitability to determine if a special species of plant or wildlife would even be present in the area. Factors such as long-term disturbance (e.g., roads, highways, utility corridors), past ground disturbing activities (e.g., agriculture, habitat fragmentation), barriers to wildlife movement and sources of potential mortality (e.g., canals, roads), human activities (e.g., recurrent OHV use), and persistent presence (e.g., roads, homes, businesses, free-ranging pets) all are to be considered in the assessment of habitat suitability and long-term wildlife management.

4.5.4.2 East Plains and Kofa Zone

Direct and Indirect Effects Common to All Segments in the Zone

See the discussion of direct and indirect effects common to all Action Alternatives (Section 4.5.4.1).

Direct and Indirect Segment-specific Effects to Sonoran Pronghorn
Additional development of the utility corridor through the Kofa NWR could facilitate increasing use of the surrounding remote areas by OHV enthusiasts, increasing the possibility of disrupting Sonoran pronghorn movements and use of the area over the long-term. Preventing the invasion and spread of non-native species is important to maintaining the quality of Sonoran pronghorn habitat and preventing wildfire. The experimental nonessential status of the Sonoran pronghorn population allows for regulatory flexibility under the ESA and other lawful activities continue unaffected; however, on a NWR a higher standard of protection is required where the Sonoran pronghorn is protected under the same standards as for a threatened species.

Construction activities associated with the Project could have negligible direct and indirect impacts on Sonoran pronghorn located within the experimental nonessential population area off the Kofa NWR, and major indirect effects to Sonoran pronghorn on the Kofa NWR. Construction activities may keep Sonoran pronghorn from water sources or may cause them to avoid the areas entirely. Sonoran pronghorn need to move widely across the landscape as habitat conditions may vary dramatically between different locations based on sporadic and localized rainfall. These individuals would move away from construction activities. Because there are large areas of similar habitat for those individuals, and construction activities would occur for a relatively short amount of time, this effect would be negligible. These potential impacts would be minimized through implementation of various APMs and BMPs (Appendix 2A, Section 2A.4) identified for general wildlife to protect habitat conditions and would include:

- A BLM approved Noxious Weed Control Plan would be implemented establishing measures for preconstruction weed surveys, weed control methods, and weed monitoring (APM-BIO-12);
- A BLM approved Habitat Restoration and Monitoring Plan would be implemented for all disturbed lands to guide plant salvage, topsoil storage and replacement, planting and seeding, and post-construction monitoring (APM-BIO-15); and
- Any additional requirements identified in consultation with the USFWS (BMP-BIO-56).

Direct and Indirect Segment-specific Effects

Table 4.5-1 details the acreage of long-term disturbance by segment in the East Plains and Kofa zone, which would be the generalized disturbance to wildlife and habitat along each segment.

Table 4.5-1 Acres of Long-term Disturbance by Segment in the East Plains and Kofa Zone

SEGMENT	LINE MILES	ANTICIPATED NUMBER OF STRUCTURES[1]	LONG-TERM DISTURBANCE[2,3] (ACRES)
p-01	26.5	88	207.4
p-02	1.2	4	7.7
p-03	2.1	6	18.5
p-04	5.5	15	46.1
p-05	2.0	9	22.0
p-06	35.6	120	300.6
d-01	25.2	83	212.1
i-01	8.3	27	66.9
i-02	3.3	11	29.6
i-03	19.9	64	156.8
Alt. SCS 12kV Dist. Line	3.1	55	<1
i-04	10.5	38	99.1
in-01	13.9	53	121.4
x-01	4.7	16	39.1
x-02a	3.2	12	29.3
x-02b	3.4	10	28.2
x-03	5.6	18	49.8
x-04	22.6	73	186.9
Alt. SCS	N/A	N/A	1.7

[1] For structure type see Table 2.4-7.

[2] For purposes of the analysis for biological resources, long-term disturbance combines short-term disturbance reported in Chapter 2 plus acres of access disturbance that was included with permanent disturbance.

[3] Totals include temporary use areas, access roads, structure locations, wire stringing locations, and SCS.

Segment p-01

The impacts associated with Project development of Segment p-01 would, in part, be ameliorated by the presence of the existing agriculture, the CAP canal, a transmission line corridor, and the I-10 corridor and the impacts associated with them, such as land disturbance and existing wildlife movement barriers. During construction, desert bighorn sheep may avoid the Big Horn Mountains #5 wildlife water, which is within 0.1-mile of the route. The route also passes across a desert bighorn sheep dispersal corridor between Burnt Mountain and the Big Horn Mountains and would temporarily disrupt movement for forage.

Segment d-01
From the Delaney Substation, this segment passes through approximately 5 miles of active agricultural lands where additional Project development would have little impact to biological resources. Then for a distance of about 20 miles, the segment crosses the alluvial fan of the Eagletail Mountains where habitat is bisected by unpaved roads and utility corridors. Where Sonoran desertscrub communities are well represented, special status species such as Sonoran desert tortoise, Gila monster, and LeConte's thrasher could experience some loss of habitat. Development of Segment d-01 would result in a loss of 212.1 acres of desert vegetation and wildlife habitat.

Segments p-02, p-03, x-01, x-02a and x-02b
Disturbance associated with the Project for these short segments would be largely indistinguishable from current conditions because the existing disturbance and human activities associated with the I-10, CAP canal, utility corridors, past agriculture, and other ground disturbance in this area have already modified the habitat and wildlife have habituated to the changed conditions.

Segments p-04 and p-05
These segments follow the existing utility corridor and natural gas pipeline, minimizing the biological effects of the project for these segments. Habitat suitability improves for Sonoran desert tortoise and other wildlife closer to the Eagletail Mountains, for which development of these segments could contribute to additional habitat degradation.

Segments i-01, i-02, and i-03
Due to past and on-going impacts to biological resources associated with the CAP canal, numerous roads, dwellings on the north and south side of I-10 at Vicksburg Road (Segment i-03), and agriculture on the north side of I-10, there would be little additional effect from development of Project segments.

Segment x-03
This segment passes through Sonoran desertscrub habitat, and the several roads and a nearby airstrip already disrupt the quality of the biological resources. Project development could cause minor disturbance and impacts to common wildlife species.

Segment x-04
While this segment follows an existing unimproved road and buried pipeline, it largely passes through good quality Sonoran desertscrub habitats before reaching the I-10 corridor, providing habitat for diverse Sonoran desert biotic communities, which include habitat for Gila monster, LeConte's thrasher, and kit fox. Project development would somewhat expand impacts to biological resources through a large section of desert, and construction could cause the special status species to temporarily relocate from the area.

Segments in-01 and i-04
Project development of segments adjacent to I-10 would have minimal impact on biological resources due to the on-going influence I-10 has on wildlife in the area.

Segment p-06

This segment is almost 36 miles long and follows the existing DPV1 line and corridor with approximately 25 miles crossing the Kofa NWR. Construction along this segment has the potential to alter habitats of various special status species including Gila monster, elf owl, gilded flicker, LeConte's thrasher, and Lucy's warbler. The portion of this segment near and through the Kofa NWR has the potential to disrupt desert bighorn sheep movement and habitat use, as well as impact good quality habitat for the Sonoran desert tortoise, and disturb golden eagles. Three wildlife waters (New Water Well, Scott Well, and Twelve Mile Well), developed primarily for desert bighorn sheep, are within 0.7 miles of the route, and wildlife may avoid these sources of water during the construction period. The route crosses between the Livingston Hills and New Water Mountains, an identified desert bighorn sheep dispersal corridor, temporarily disrupting movement for forage. This segment, along with most alternative segments to Segment p-06 within the East Plains and Kofa Zone, are within the designated experimental nonessential population area for the Sonoran pronghorn; except within the Kofa NWR where the Sonoran pronghorn is protected as a threatened species. Sonoran pronghorn may avoid the area during construction, thereby disrupting natural movement patterns, and forage habitat and access to water sources would be lost in the short term until construction areas are revegetated.

Construction activities associated with Segment p-06 would not be in compliance with the National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997 and could have significant direct and indirect impacts on the continued management of the Kofa NWR for the conservation and development of natural wildlife. These impacts would be major, with both short- and long-term effects, and cannot be mitigated. The USFWS states (USFWS 2017) that the construction of a new transmission line across the Kofa NWR is not an appropriate use on the refuge.

4.5.4.3 Quartzsite Zone

<u>Direct and Indirect Effects Common to All Segments in the Zone</u>

See the discussion of direct and indirect effects common to all Action Alternatives (Section 4.5.4.1).

<u>Direct and Indirect Segment-specific Effects</u>

Table 4.5-2 details the acreage of long-term disturbance by segment in the Quartzsite zone, which would be the generalized disturbance to wildlife and habitat along each segment.

Table 4.5-2 Acres of Long-term Disturbance by Segment in the Quartzsite Zone

SEGMENT	LINE MILES	ANTICIPATED NUMBER OF STRUCTURES[1]	LONG-TERM DISTURBANCE[2,3] (ACRES)
p-07	2.2	7	22.9
p-08	0.6	2	6.6
i-05	2.8	9	26.8
qn-01	0.6	3	6.1
qn-02	10.8	37	93.8
qs-01	3.1	10	26.7
qs-02	4.8	17	44.3
x-05	10.2	35	99.6
x-06	9.2	32	102.3
x-07	7.7	26	66.1

[1] For structure type see Table 2.4-7.

[2] For purposes of the analysis for biological resources, long-term disturbance combines short-term disturbance reported in Chapter 2 plus acres of access disturbance that was included with permanent disturbance.

[3] Totals include temporary use areas, access roads, structure locations, wire stringing locations, and SCS.

Project segments in the Quartzsite Zone are associated with passing through or around urban development and the BLM LTVA, and often follow highway corridors. Consequently, the quality of the biological resources of segments in this zone has generally been compromised by past development and ongoing human presence.

Segments i-05, qs-01, qs-02, and qn-01

Each of these segments parallel or cross I-10 in the vicinity of Quartzsite. The corridor has been subject to long-term disturbance due to the highway, traffic, and presence of people. The Sonoran desertscrub community would largely be inhabited by low to moderate densities of common wildlife species. Additional disturbance associated with the Project would be largely indistinguishable from current conditions.

Segment qn-02

This segment loops around the north side of Quartzsite, crossing US 95 just north of residential developments (a little over 2 miles north of I-10). Though there are various unimproved roads and persistent recreation use throughout the area, the far northeast and northwest portions of the segment include Sonoran desertscrub habitat with common wildlife species as well as the potential for special status species such as Gila monster, LeConte's thrasher, and kit fox. Various desert amphibians would occur in association with Tyson Wash during periods of rains; the lusher vegetation along the wash may also support Lucy's warbler. Project development of Segment qn-02 would likely result in localized, site-specific impacts along portions of the route that are farthest from human activities.

Segment x-05
This segment passes mostly north-south along the foothills and alluvial fan on the west side of the Plomosa Mountains. Though close to long-term visitor camping areas (approximately 1.2 miles from the centerline of the segment), and the presence of numerous unimproved roads, various special status species may occur in the Sonoran desertscrub habitat within the corridor, mostly due to the proximity to the Plomosa Mountains and the Kofa NWR. Golden eagle, Gila monster, elf owl, gilded flicker, and Lucy's warbler may be present, and may be impacted by segment development.

Segments x-06 and x-07
Segment x-06 follows the east perimeter of the BLM LTVA and Segment x-07 parallels US 95. Both are within areas disturbed by persistent human presence, roads, and traffic. The Sonoran desertscrub community is impacted by these uses and would largely be inhabited by low to moderate densities of common wildlife species, resulting in minimal impacts from Project development.

Segment p-07 and p-08
These are short sections near US 95, and their development would not add new impacts to biological resources.

4.5.4.4 Copper Bottom Zone

<u>Direct and Indirect Effects Common to All Segments in the Zone</u>

See the discussion of direct and indirect effects common to all Action Alternatives (Section 4.5.4.1).

<u>Direct and Indirect Segment-specific Effects</u>

Table 4.5-3 details the acreage of long-term disturbance by segment in the Copper Bottom Zone, which would be the generalized disturbance to wildlife and habitat along each segment.

Table 4.5-3 Acres of Long-term Disturbance by Segment in the Copper Bottom Zone

SEGMENT	LINE MILES	ANTICIPATED NUMBER OF STRUCTURES[1]	LONG-TERM DISTURBANCE[2,3] (ACRES)
p-09	6.9	23	58.50
p-10	1.1	4	27.10
p-11	4.1	13	72.90
p-12	2.5	8	28.70
p-13	3.5	11	34.70
p-14	0.9	3	10.30
cb-01	3.2	15	66.90
cb-02	2.2	11	32.20

SEGMENT	LINE MILES	ANTICIPATED NUMBER OF STRUCTURES[1]	LONG-TERM DISTURBANCE[2,3] (ACRES)
cb-03	4.3	17	4.20
cb-04	1.9	5	65.30
cb-05	4.4	17	29.10
cb-06	1.9	8	66.90
i-06	7.2	26	62.90
i-07	6.3	22	55.90
x-08	1.3	6	10.3

[1] For structure type see Table 2.4-7.

[2] For purposes of the analysis for biological resources, long-term disturbance combines short-term disturbance reported in Chapter 2 plus acres of access disturbance that was included with permanent disturbance.

[3] Totals include temporary use areas, access roads, structure locations, wire stringing locations, and SCS.

These Project segments in the Copper Bottom Zone are associated with passing through the Dome Rock Mountains, either along the I-10 corridor or through Copper Bottom Pass.

The construction of Segments p-09, p-10, and p-11 would require helicopter fly yards, which would require crushing, mowing, or removal of vegetation and would disturb soil on 5.8, 20.0, and 7.6 acres, respectively. Helicopter fly yards would generate greater amounts of fugitive dust than in other zones where helicopters are not used; therefore, the potential to affect photosynthetic rates and decrease plant productivity would be higher in the vicinity of the fly yards. The Erosion, Dust, and Air Quality Plan would include information about the reduction of dust emissions generated from helicopter use. The noise and dust associated with the helicopter fly yards would also cause a higher level of wildlife disturbance; however, adherence to seasonal wildlife restrictions per the AGFD, CDFW, and/or applicable RMPs (BMP-BIO-32) would eliminate these effects during sensitive periods. Wildlife would be expected to return after helicopter use had ceased and habitat was restored. Therefore, these effects would be negligible to minor and short term.

Segments p-09 and p-10
Segment p-09 heads west from US 95 following the exiting DPV1 line and pipeline corridors, and the well-used dirt road into the Dome Rock Mountains near the Copper Bottom Pass with Segment p-10 continuing into Copper Bottom Pass to the head of Johnson Canyon below Cunningham Peak. Segment p-09 crosses Tyson Wash, where desert toads may be found during rainy periods, and Lucy's warblers may nest in associated dense vegetation. The impacts of Project development would be additive to the existing habitat fragmentation through the narrow Copper Bottom Pass. Helicopter fly yards would be located within Segment p-09 (5.8 acres) and Segment p-10 (7.6 acres).

Segment cb-01
This segment is entirely within remote, mountain slopes high on Cunningham Peak within the Dome Rock Mountains. This area is used by desert bighorn sheep, including as lambing areas. The segment passes within 0.6- and 0.7-mile of wildlife waters Dome Rock and Tule Tank,

respectively. Project development may impact important desert bighorn sheep use area. A helicopter fly yard would be located within Segments cb-01/cb-02 (43.5 acres).

Segments p-11 and cb-03
These segments run parallel on either side of the narrow Copper Bottom Pass, following the DPV1 line and buried natural gas pipeline. This is a desert bighorn sheep use and lambing area, and a movement corridor within the Dome Rock Mountains. Both routes pass within 0.1 mile of wildlife water Dome Rock Mountain #1 and within 1.0 mile from Dome Rock wildlife water. The impacts of Project development would be additive to the existing habitat fragmentation through the narrow Copper Bottom Pass. A helicopter fly yard would be located within Segment p-11 (20.0 acres).

Segments cb-02 and cb-04
These segments cross through remote, almost pristine mountain habitats northwest of Cunningham Peak. Segment cb-02 parallels a portion of Johnson Canyon, with well represented desert wash vegetation, likely providing habitat for special status species such as Gila monster, Sonoran desert tortoise, and Lucy's warbler. A developed wildlife water in Johnson Canyon (Dome Rock) is used by desert bighorn sheep and mule deer. This is a desert bighorn sheep lambing area. Project-related construction within Johnson Canyon would only occur from July through September, outside of peak OHV season. This restriction is applied to mitigate effects related to the temporary construction closure of the proposed Arizona Peace Trail and other OHV routes through Johnson Canyon. However, this is a critical period for wildlife, which is subjected to very harsh conditions during the summer months when water is often in limited supply. Concentrating construction activities during these months may reduce access by desert bighorn sheep and mule deer to reliable water sources, and limit use of favored habitat areas. There is developed water (Dome Rock Mountain #1) about 1 mile away on the opposite side of the road through Copper Bottom Pass; another water source (Tule Tank) is about 2.5 miles away on the opposite side of Cunningham Peak. Project development would impact near-pristine desert in this area and may result in disturbance to desert bighorn sheep and mule deer during a critical time period. A helicopter fly yard would be located within Segments cb-01/cb-02 (43.5 acres).

Segments i-06 and i-07
These segments follow the I-10 corridor through the Dome Rock Mountains and across the alluvial plain of desert pavement and washes to the Colorado River corridor. Desert bighorn sheep may use the steep slopes on both sides of I-10 through the pass, and the pass provides for movement by wildlife through the Dome Rock Mountains, even with the presence of the interstate highway. Project development of segments adjacent to I-10 would have minimal impact due to the on-going influence I-10 has on wildlife in the area.

Segments p-12, p-13, p-14, cb-05, cb-06, and x-08
These segments are between the west side of the Dome Rock Mountains and the Colorado River. These lower elevation areas present very harsh desert conditions, with large areas of desert pavement, and most of the vegetation is restricted to washes and rills. Project development would add disturbance to a remote area.

4.5.4.5 Colorado River and California Zone

<u>Direct and Indirect Effects Common to All Segments in the Zone</u>

See the discussion of direct and indirect effects common to all Action Alternatives (Section 4.5.4.1).

Rare and Sensitive Vegetation Alliances
Three rare plant alliances on the Palo Verde Mesa are crossed by one or more route alternatives (Appendix 1, Figure 3.5-3). Initial Project planning indicates that structure placement and access road use on BLM-administered land could result in impacts to the *Pleuraphis rigida* (big galleta) Alliance and/or *Prosopis glandulosa* (honey mesquite) Alliance, depending on route segment selection. The *Pleuraphis rigida* Alliance is a sand dune vegetation alliance; impacts would be minimized through BMPs BIO-53 and BIO-54 (Appendix 2A, Section 2A.4). Any required mitigation in California would be addressed during micrositing for the Project.

Table 4.5-4 details the acres of disturbance to rare vegetation alliances on the Palo Verde Mesa by segment.

Table 4.5-4 Disturbance to Rare Vegetation Alliances on the Palo Verde Mesa

<table>
<tr><th rowspan="2">RARE VEGETATION ALLIANCE</th><th rowspan="2">SEGMENTS</th><th colspan="2">TOTAL DISTURBANCE* (ACRES)</th></tr>
<tr><th>BLM</th><th>NON-BLM</th></tr>
<tr><td>Pleuraphis rigida Alliance
(big galleta)</td><td>ca-02
ca-06
ca-07
x-15
x-16</td><td>0.2
0.07
0.4
0.6
1.5</td><td>0
0
0
0</td></tr>
<tr><td>Pluchea sericea Alliance
(arrowweed)</td><td>ca-06</td><td>0</td><td><0.1</td></tr>
<tr><td>Prosopis glandulosa Alliance
(honey mesquite)</td><td>ca-02
p-16</td><td>0.1
0</td><td>0
0.1</td></tr>
</table>

* Structures and access.

In California on BLM lands, specific protection measures for four desert riparian woodland alliances (*Prosopis glandulosa* Alliance [also rare], *Pluchea sericea* Alliance, *Parkinsonia florida–Olneya tesota* Alliance, and *Suaeda moquinii* Alliance) (Appendix 1, Figure 3.5-3) include a 200-foot setback from the outer perimeter of these alliances for ground disturbing (and vegetation disturbing) activities. Minor incursions would be allowed to balance avoiding the need for vegetation trimming while maintaining an appropriate buffer (BMP-BIO-52, Appendix 2A, Section 2A.4). Any loss of desert riparian woodland would be compensated at a 5:1 ratio.

Harwood's Eriastrum

Harwood's eriastrum is the only BLM designated sensitive species known to be present on the Palo Verde Mesa. As an annual plant, effectiveness of surveys is often dependent on rainfall conditions. Negative survey results do not assure that the seed bank is not present. The plant was not located during surveys conducted under drought conditions in 2016, but clusters of Harwood's eriastrum were found in sand dune habitat, primarily along segments ca-09 and ca-07 north of the Colorado River Substation, during surveys conducted in spring of 2017 (Appendix 1, Figure 3.5-5). Previous surveys conducted for other projects have located Harwood's eriastrum in this same general area and elsewhere on the Palo Verde Mesa.

Ground-disturbing activity, including structure pad preparation and construction, grading of new access roads, clearing of staging areas, and use or improvement of existing access roads have the potential to disturb or destroy individual plants and seed bank of this annual herbaceous species. As an inhabitant of wind deposited dune habitat, project facilities, structures, and construction practices (e.g., equipment stockpiles, access road stabilization) could interfere with wind-driven sand transport mechanisms and alter the condition, distribution, and quality of the aeolian dune system. Dunes can be stabilized or partially stabilized where sand becomes somewhat anchored by both native and non-native plants, and fine, loose sand is blown away while not being replaced by sand transported from upwind. Project impacts to active and stabilized sand dunes include the potential introduction and spread of non-native vegetation, clearing of native vegetation, temporary or long-term interruption of sand transport, and resulting compaction of soils due to development of access roads and clearing of work areas, potentially altering the structure of the dune community.

Though the DRECP LUPA maps most of the Palo Verde Mesa as part of a sand and dune system (Appendix 1, Figure 3.3-8), active sand transport is limited primarily to a corridor north of the Colorado River Substation that is about 1-mile-wide extending to the east a distance of about 5 miles (Appendix 1, Figure 3.3-8), consistent with where Harwood's eriastrum has been located. In accordance with BMP-BIO-53 and BMP-BIO-54, within aeolian corridors that transport sand to dune formations, activities are to be designed and operated to facilitate the flow of sand, and roads would be at grade (e.g., no berms) to avoid trapping or diverting sand from the corridor. As discussed in Section 4.3.4.5, structure footings would be 6 feet in diameter and extend about 2 feet above ground level, and would cause intermittent, localized disruptions of the flow of sand for short distances. Tangent lattice structures would be used, which would minimize obstruction to sand transport. Tangent lattice structures would allow winds to essentially blow through the structure, minimizing the impact on sand transport. Because of the small size and configuration of the structure foundations, the long distances between structures, and the linear west to east Project alignment consistent with wind direction, the impacts to sand transport are considered negligible to minor. Maintenance of sand dune habitats are more dramatically affected by the presence of Sahara mustard, which in strong bloom years may virtually shut down aeolian sand migration; climate change and altered storm patterns; and changes in hydrology due to flood control measures associated with I-10 and other roads (Kenney 2017).

The DRECP LUPA prescribes specific CMAs for Harwood's eriastrum and its dune habitat to avoid and minimize impacts on BLM lands. These measures include implementing an avoidance setback of 0.25 mile from all occurrences of the plant to protect ecological processes and establishing a limit (cap) for impacts to suitable habitat to a maximum of 1 percent throughout all

BLM lands included within the DRECP. However, based on the distribution of potentially suitable habitat (Appendix 1, Figure 3.5-6), Harwood's eriastrum is expected to be present along all Project alternatives crossing the Palo Verde Mesa such that a 0.25-mile setback would preclude the Project from connecting with the Colorado River Substation. Therefore, if Project design is not consistent with DRECP LUPA specifications, exceptions can be allowed through an amendment to the CDCA Plan as long as the goals established by the LUPA are met. Since it can be shown that the linear nature of the Project can avoid impacts to the ecological processes (i.e., sand movement) that support populations of this plant species, and meet the DRECP goal of promotion of the ecological processes that sustain special vegetation types and BLM sensitive species, the CDCA Plan, as amended, is further amended to allow Project construction to proceed provided a Linear Right-of-Way Rare Plant Protection Plan for Harwood's Eriastrum is developed with the objectives of:

1) Avoidance of take of individual plants to the maximum extent practical; and
2) Avoidance of impacts to Harwood's eriastrum suitable habitat to the maximum extent practical.

To achieve these objectives, implementation of BMP-BIO-31 is required in Harwood eriastrum suitable habitat. These provisions are:

- Pre-construction surveys would be required; this would capture Harwood's eriastrum individuals present in the final ROW alignment, access road, and structure locations.
- Avoid Harwood's eriastrum individuals located during the pre-construction surveys through micrositing facilities to the maximum extent practical.
- Within suitable habitat for Harwood's eriastrum, use overland travel (drive and crush) in lieu of road construction to pad sites to the maximum extent practical.
- On non-agricultural public lands in California, an authorized botanist would be on site for all construction activities involving surface disturbance or overland travel.
- Within suitable habitat for Harwood's eriastrum, keep equipment to the minimum necessary to accomplish the necessary work.
- On public lands in California, avoid establishing features that would interfere with the movement of sand to the maximum extent practical.
- Laydown and temporary use sites would not be located within suitable habitat for Harwood's eriastrum.
- On public lands in California, use existing roads or routes to the maximum extent practical.
- Develop and implement an Invasive Species Management Plan (specific to the rare plant habitat) that California State Director would approve prior to a notice to proceed for work on public lands in California.
- No surface disturbance or overland travel would occur within occupied habitat for Harwood's eriastrum from 15 February through 31 July. This stipulation does not apply to verified, unoccupied habitat.

- No take of Harwood's eriastrum individuals would be allowed without California State Director approval.

Table 4.5-5 details disturbance to suitable Harwood's eriastrum habitat by segment in the Colorado River and California zone based upon the presumed habitat.

Table 4.5-5 Disturbance to Suitable Harwood's Eriastrum Habitat by Segment using the Presumed Habitat

SEGMENT	ANTICIPATED STRUCTURES PER SEGMENT IN SUITABLE HABITAT	ANTICIPATED NEW ACCESS PER SEGMENT IN SUITABLE HABITAT	ANTICIPATED TOTAL DISTURBANCE* (ACRES)	
	(NUMBER)	(MILES)	BLM	NON-BLM
p-16	0	0	0	0
p-17	0	0	0	0
p-18	2	0.6	0.4	2.9
x-15	0	0	<0.01	0
x-16	0	0	0	0
x-19	3	1.1	3.54	0.9
ca-02	0	0	0	0
ca-06	0	0	0	0
ca-07	4	0.9	6.1	0.1
ca-09	11	3.6	13.1	3.7

*Structures and access.

Initial Project planning indicates that structure placement and access road use could result in impacts within Harwood's eriastrum suitable habitat (Table 4.5-5). However, it is expected that these impacts would be further reduced based on micrositing and implementation of BMP-BIO-31.

For the purposes of implementing BMP-BIO-31, occupied habitat is defined as the location of a live Harwood's eriastrum plant. Upon the death and desiccation of the annual plant, or the absence of germination due to lack of precipitation, the area would be included as suitable habitat but would not be considered occupied habitat. Even though the DRECP mapped the range-wide distribution of Harwood's eriastrum, a more accurate representation of suitable habitat on the Palo Verde Mesa was derived using soil maps (e.g., aeolian surficial deposits), known locations of Harwood's eriastrum, and Mojave fringe-toed lizard distribution—a sympatric, dune obligate species (Appendix 1, Figure 3.5-6). This mapping defines suitable habitat on the Palo Verde Mesa and is used for Project-specific impact assessment. However, a similar range-wide map for Harwood's eriastrum is not available. To evaluate the 1 percent limit on impacts to Harwood's eriastrum range-wide on BLM lands, the distribution model developed for the DRECP was applied.

The DRECP modeled 288,404 acres, including most of the Palo Verde Mesa, which is on the east end of the approximately 50-mile long, east-west trending Chuckwalla Valley, as the distribution of Harwood's eriastrum on BLM lands addressed by the DRECP LUPA. Using the DRECP model, all Project-related ground disturbance activities (e.g., structure construction, access road development) were calculated by Project Alternative. Based upon the modeled habitat, Alternative 2 would potentially disturb 60.2 acres of Harwood's eriastrum habitat (0.02 percent of the total modeled habitat range-wide), more than any other Alternatives, and this estimate for Project impact acres does not consider additional reduction in area of impact that would be achieved through micrositing. Other BLM-approved projects have occurred within the Chuckwalla Valley, including the Colorado River Substation, Desert Sunlight, and Genesis. A total of 313.59 acres of modeled Harwood's eriastrum habitat has been impacted by these past projects (Colorado River Substation 77.27 acres; Desert Sunlight 0 acres; Genesis 236.32 acres), and together with the proposed Project would impact 373.8 acres of DRECP modeled habitat. There is a total of 103,958 acres of modeled Harwood's eriastrum habitat in the Chuckwalla Valley; all projects in Chuckwalla Valley combined result in impacts to 0.36 percent of DRECP modeled Harwood's eriastrum habitat within Chuckwalla Valley, or 0.12 percent of modeled habitat range-wide. The sum of impacted habitat from these projects on BLM land is below the 1 percent cap (i.e., 2,884 acres).

Project implementation could have direct and indirect impacts on special status plant species located within areas disturbed by construction activity; however, these potential impacts would be either eliminated and/or minimized through implementation of various APMs and BPMs (Appendix 2A, Section 2A.4) that include:

- A BLM approved Vegetation Management Plan would be implemented to guide plant surveys, plant salvage requirements under the Arizona Native Plant Law, stumpage fee determinations, and vegetation pruning and control (APM/BMP-BIO-11, APM-BIO-26, BMP-BIO-37, BMP-BIO-41, BMP-BIO-43);
- Measures would be taken to minimize the loss of saguaro cactus (BIO-16);
- Surveys for sensitive and protected plant species would be conducted in all disturbance areas, and sensitive plants would be avoided where possible during construction (APM-BIO-24, APM-BIO-26);
- An Erosion, Dust, and Air Quality Plan would include information about the reduction of dust emissions generated from helicopter use;
- A BLM approved Habitat Restoration and Monitoring Plan (Appendix 2B) would be implemented for all disturbed lands. In California, special measures would be implemented such that soil horizons would be stored separately where crucial for rare plant species (APM/BMP-BIO-15); and
- Protection measures for Harwood's eriastrum and its habitat would be applied, including the preparation of a Linear Right-of-Way Rare Plant Protection Plan for Harwood's Eriastrum (BMP-BIO-31, BMP-BIO-32).

Aquatic and Wetland Habitat

The only aquatic and associated wetland habitat that is crossed by the Project is the Colorado River and various canals and drains serving the agricultural areas west of the Colorado River. Between potential Project crossing locations, a backwater channel east of and parallel to the river channel would be avoided by spanning the aquatic habitat. There would be no direct impact to fishes (e.g., razorback sucker and bonytail chub).

Mojave Fringe-toed Lizard
The Mojave fringe-toed lizard is only found in areas of loose, wind-blown sand, such as on the Palo Verde Mesa. Project-related impacts to the Mojave fringe-toed lizard are similar to those discussed for less mobile wildlife species that are susceptible to being killed during vegetation removal, crushed in burrows, and run over by construction equipment and vehicles. When frightened, Mojave fringe-toed lizards will flee and then bury themselves in the loose sand, increasing the potential that Project activities could unknowingly crush individuals, including mortality from use of access roads.

By definition, dune habitat shifts on the landscape in response to wind patterns and may create small (unmapped) patches of suitable Mojave fringe-toed lizard habitat throughout the sand field. Dunes can be stabilized or partially stabilized where sand becomes somewhat anchored by both native and non-native plants, and fine, loose sand is blown away while not being replaced by sand transported from upwind. Project impacts to active and stabilized sand dunes include the potential introduction and spread of non-native vegetation, and the clearing of native vegetation and resulting compaction of sands to establish access roads and clear work areas, potentially altering the structure of the dune community. Because of the small size and configuration of the structure foundations, the long distances between structures, and the linear west to east Project alignment consistent with wind direction, the impacts to sand transport are considered negligible to minor.

Construction activities associated with the Project could have direct and indirect impacts on Mojave fringe-toed lizards located within areas disturbed by construction activity; however, these potential impacts would be minimized through implementation of various APMs and BMPs (Appendix 2A, Section 2A.4) identified for general wildlife and would include:

- Preconstruction surveys would be conducted in California for Mojave fringe-toed lizards (APM-BIO-25); and
- A Mojave Fringe-toed Lizard Linear ROW Protection Plan would be prepared that identifies specific conservation measures to minimize Project-related impacts to sand dunes and sand transport areas, to map suitable habitat within construction zones, and methods to achieve clearance surveys within suitable habitat so animals are not killed by construction activities (BMP-BIO-49).

The habitat model developed for the DRECP maps most of the Palo Verde Mesa as potentially suitable habitat for the Mojave fringe-toed lizard (Appendix 1, Figure 3.3-8). However, a more accurate representation of suitable habitat on the Palo Verde Mesa was derived using soil maps (e.g., aeolian surficial deposits), known locations of the Mojave fringed-toed lizard from the CNDDB, and occurrence records for Harwood's eriastrum—a sympatric, dune obligate species. These data tended to cluster and polygons of presumed suitable Mojave fringe-toed lizard habitat were mapped (Appendix 1, Figure 3.5-11). This mapping defines suitable habitat on the Palo Verde Mesa and is used for Project-specific impact assessment for implementation of clearance surveys on BLM land. The anticipated Project impacts to Mojave fringe-toed lizard habitat by segment is identical to Harwood's eriastrum, as provided in Table 4.5-5, using the presumed habitat.

Alternative 2 would potentially disturb 60.2 acres of DRECP modeled Mojave fringe-toed lizard habitat, more than any other Alternatives, and this estimate for Project impact acres does not consider additional reduction in area of impact that would be achieved through micrositing. These acres account for 0.048 percent of all modeled Mojave fringe-toed lizard habitat across the Chuckwalla Valley (i.e., 132,117 acres).

Wildlife Corridors
In California, an identified 5-mile-wide wildlife movement corridor centered on Wiley's Well Road (2.5 miles to each side of Wiley's Well Road) provides linkage across I-10 between the Mule and McCoy mountains. The Project is 4.5 miles from the Wiley's Well Road, and thus outside the linkage corridor. The Colorado River corridor is an important migratory pathway for birds and provides a movement corridor for terrestrial wildlife to move around the extensive agricultural fields and across I-10.

Direct and Indirect Segment-specific Effects

Table 4.5-6 details the acreage of long-term disturbance by segment in the Colorado River and California zone, which would be the generalized disturbance to wildlife and habitat along each segment.

Table 4.5-6 Acres of Long-term Disturbance by Segment in the Colorado River and California Zone

SEGMENT	LINE MILES	ANTICIPATED NUMBER OF STRUCTURES[1]	LONG-TERM DISTURBANCE[2,3] (ACRES)
p-15e	2.8	10	36.00
p-15w	6.6	24	44.90
p-16	4.6	18	42.10
p-17	3.1	12	28.30
p-18	2.4	10	34.50
ca-01	6.7	26	36.00
ca-02	3.4	13	44.90
ca-04	0.4	2	42.10
ca-05	6.6	26	28.30
ca-06	2.8	10	34.50
ca-07	3.0	11	36.00
ca-09	2.6	9	44.90
cb-10	1.9	8	18.4
i-08s	1.3	6	11.8
x-09	0.8	4	9.80
x-10	1.3	5	10.30

SEGMENT	LINE MILES	ANTICIPATED NUMBER OF STRUCTURES[1]	LONG-TERM DISTURBANCE[2,3] (ACRES)
x-11	2.1	7	21.30
x-12	1.3	4	17.30
x-13	2.0	7	15.60
x-15	1.4	6	16.00
x-16	2.3	8	22.10
x-19	1.0	5	18.40

[1] For structure type see Table 2.4-7.

[2] For purposes of the analysis for biological resources, long-term disturbance combines short-term disturbance reported in Chapter 2 plus acres of access disturbance that was included with permanent disturbance.

[3] Totals include temporary use areas, access roads, structure locations, wire stringing locations, and SCS.

Segments i-08s, cb-10, p-15e

There are three options for crossing the Colorado River. Segment i-08s would cross the river about 0.75-mile south of the I-10 bridge. Located about 5 miles south of I-10, Segment p-15e would cross the river parallel to the existing DPV1 line; and Segment cb-10 would cross the river about 0.5 mile north of Segment p-15e. Because Segment p-15e would match the existing structure spacing and conductor heights of DPV1 at the river crossing, and place conductor bundles in a horizontal, parallel configuration, collision hazard to migratory birds moving up and down the river corridor would be reduced compared to other segments.

The river corridor on the east (Arizona) side of the river at Segment i-08s extends less than 1,000 feet from the river to agricultural development, and a backwater extends south from this crossing location. The river corridor is up to 0.7-mile wide at crossings for Segment cb-10 and Segment p-15e. The vegetation in the river's floodplain is dominated by salt cedar and saltbush, with small, dense stands of mesquite and paloverde; riparian vegetation (primarily salt cedar) is limited to a narrow band adjacent to both sides of the river. Irrigated fields are immediately west of the river at these crossing locations. Project development would avoid riparian vegetation whenever possible, and where the Project would cross the river and along backwaters. Segments p-15e and cb-10 may each require three or four structures within the river corridor while Segment i-08s may have one or no structures within the river corridor. Though structures would be sited to minimize loss of riparian vegetation, development of Segment i-08s would result in a minor reduction of impacts to riparian vegetation and the potential future establishment of riparian vegetation than the other segments. Because open water, including backwaters, would be spanned by all alternatives, no segment would directly impact aquatic habitats.

Segments p-15w, p-16, ca-01, ca-02, ca-05, ca-06, x-09, x-10, x-11, x-12, x-13

These segments west of the Colorado River and within its historic floodplain cross irrigated agricultural fields, orchards, and other developed land. Numerous irrigation canals and drains in that area contain open water for part or all of the year. The Project would span canals that are often used by birds. Agricultural areas and associated canals and water features are frequently used by waterfowl, sandhill cranes, raptors, and a wide range of other species. Development in agricultural areas could result in avian mortality due to collision with transmission lines and structures. Though all segments would place conductor bundles in a horizontal, parallel configuration to reduce collision hazard, Segment p-15w parallels DPV1 and would match the existing structure spacing and conductor heights thereby further reducing the collision hazard.

Since all rare plant alliances are protected by a 200-foot setback from Project-related ground disturbing activities on BLM land, impacts to protected plant alliances should be avoided by each segment. However, initial planning includes structures and access roads within protected vegetation communities. Segment ca-02crosses a small stand of the *Prosopis glandulosa* (honey mesquite) Alliance; 0.51-acre of this alliance may be impacted by the Project. A structure is planned where Segment ca-06 crosses less than 0.1 mile of the *Pluchea sericea* (arrowweed) Alliance potentially impacting 0.18 acre; however, this is private land and not subject to BLM requirements (Table 3.5-3).

Segments p-17, p-18, ca-07, ca-09, x-15, x-16, and x-19
West of the agricultural fields to the Colorado River Substation, route segments cross areas with very sandy soil on the Palo Verde Mesa. The amount of sand in the soil increases, and the stability of the soil surface decreases, from east to west. These segments are within the sand and dune system as mapped by the DRECP, as well as modeled habitat for Harwood's eriastrum and Mojave fringe-toed lizard. Though the entire mesa is considered part of a sand and dune system, Segments ca-07, ca-09, and a portion of x-19 cross an area of active windblown sand deposition (Appendix 1, Figure 3.3-8). This is where Hardwood's eriastrum has been located and Mojave fringe-toed lizards are more common. These segments pass through about 3.5 miles of sand dune habitat, and about 18 structures would be constructed. Development of Segments ca-07, ca-09, and x-19 would impact 22.7 acres (Table 4.5-5) of BLM dune habitat (plus another 4.7 acres on private land) and have substantively more potential to impact suitable habitat for both Harwood's eriastrum and Mojave fringe-toed lizard than other routes leading to the substation.

Segments p-17 and p-18, the southernmost route segments heading to the Colorado River Substation, cross sparse stands of creosote and white bursage, and cross three protected washes classified as the *Parkinsonia florida–Olneya tesota* (blue paloverde-ironwood) Alliance; 1.4 acres would be impacted on BLM-administered lands, while impacts to 0.3 acre of wash habitat would be on private land and not subject to BLM requirements. Segment ca-07 also has one crossing of a wash possibly impacting approximately 0.1-acre of BLM land. Soils along part or most of Segments p-17 and p-18 are quite sandy, though these segments do not cross areas classified as having active aeolian deposits (a small area of active deposition is adjacent to Segment p-17). Segments p-17 and p-18 approach the Mule Mountains, where some of the more suitable habitat for the threatened Mojave desert tortoise is found. The north-south oriented Segments x-15 and x-16, and the eastern end of Segment ca-07 cross or pass close to extensive stands of *Pleuraphis rigida* (big galleta) Alliance; this includes 0.7 mile of Segment x-16, and 0.3 miles of Segment ca-07. As planned, up to 6.8 acres of *Pleuraphis rigida* (big galleta) Alliance could be affected, and due to the extensive stand of *Pleuraphis rigida* (big galleta) Alliance along Segments x-15, x-16, and ca-07, these segments may result in impacts to rare plant alliance that other segments could avoid.

4.5.5 Operations, Maintenance, and Decommissioning

The anticipated operations and maintenance duration is 50 years. Though most impacts to biological resources are expected to occur in association with construction, some Project-related activities and Project effects would continue. Noise and human presence that would disturb wildlife could result from many on-going Project activities. The use of vehicles and occasionally heavy equipment could result in crushing and removal of plants, collisions with animals, collapsing burrows, and loss of refugia. The long-term presence of structures and guy lines remain a collision threat to birds. The transmission line would be inspected annually or as required by using fixed-wing aircraft, helicopters, ground vehicles, all-terrain vehicles, or on foot. Maintenance of the line and facilities would be performed as needed. Maintenance vehicles would generally require access to the ROW once yearly, and where long-term access is required for maintenance and operation, a regular maintenance program may include, but would not be limited to, blading, ditching, culvert installation, and surfacing. The SCS would require minor maintenance over a 3-to 5-day period once each year.

Repair and maintenance, including replacement of conductors, and decommissioning may require the same types of equipment used during construction, including power augers for hole boring, backhoes for excavation, and/or concrete trucks and cranes for structure erection. Other required equipment may include power tensioners, pullers, wire trailers, crawler tractors, and trucks and pickups for hauling materials, tools, and workers. Helicopters may be used in some circumstances. The frequency and duration of repair activities is unknown but would be a temporary impact.

4.5.5.1 Vegetation

As part of operations and maintenance activities, vegetation within the ROW may be selectively removed or trimmed in accordance with the vegetation management plan (APM/BMP-BIO-11) to provide the required minimum conductor clearance. Maintenance crews would routinely trim vegetation and remove brush within the ROW as necessary, perhaps as often as once a year, to prevent accidental grounding contact with conductors.

The potential introduction of non-native plant species would be less likely than during construction but would continue during the operation and maintenance phases of the Project. Disturbed soils at previous work sites and along access roads, though stabilized by restoration actions, remain vulnerable to colonization of invasive species; maintenance vehicles could transport weed seeds or plant parts in soils adhering to vehicles and other equipment. As part of Project operations, it is anticipated that the Noxious Weed Management Plan (APM-BIO-12) would require regular monitoring for invasive and noxious weeds at each site where Project activities resulted in soil disturbance, and treatment, as appropriate.

Where access is required for nonemergency maintenance and repairs, the same precautions against ground disturbance that were taken during construction would be followed and applicable APMs and BMPs would be implemented. Restoration and reclamation procedures following completion of repair work would be similar to those prescribed during construction, and any necessary temporary staging areas outside the ROW would require authorization.

Assuming that a Vegetation Management Plan (APM/BMP-BIO-11), Habitat Restoration Plan (APM/BMP-BIO-15), and Noxious Weed Management Plan (APM-BIO-12) are thorough and effectively implemented and that the same precautions against ground disturbance and other APMs and BMPs are implemented throughout the Project Area as defined for construction activities during operations, maintenance, and decommissioning:

- Project operations may result in negligible impacts to vegetation resources;
- Project maintenance may result in minor impacts to vegetation resources; and
- Project decommissioning may result in moderate impacts to vegetation resources.

4.5.5.2 Wildlife

Project-related impacts to wildlife are associated with disturbance due to human presence; equipment operations and related noise; potential collision by and electrocution of raptors and other large birds from the lines; potential enhancement of predator populations; degradation, fragmentation, and loss of habitat from changes in vegetation structure, new or expanded access roads, and the increase in human activity; and facilitating human access into remote areas of the desert. These impacts are primarily due to construction activities but continue at varying magnitudes in association with Project operations, maintenance, and decommissioning.

Project operations require occasional presence of people and activities for annual line and facilities inspection, and maintenance of facilities conducted on an as needed basis. Site visits may occur to monitor and treat invasive plants, monitor restoration sites, and to conduct other resource management actions. Site visits, including helicopter inspection of the lines, may result in wildlife temporarily fleeing an area, but within the animal's normal behavior patterns. Some individuals of small wildlife (e.g., rodents, rabbits, snakes, lizards) may be run over by vehicles. However, these visits are infrequent, and consistent with current use of roads throughout the Project Area open for public use. The roads used for Project access and operations would contribute to habitat fragmentation, and are also available for use by recreationists, perhaps leading into areas where vehicle access was previously precluded due to lack of roads. However, where the Project parallels other high-voltage utility lines, buried pipelines, or established roads, access to the area is already open to non-Project personnel.

Successful habitat restoration may take many years before wildlife would use these areas at the level prior to impact and restoration. The presence of utility lines and structures may provide on-going opportunities for raptors and ravens to perch and possibly nest, increasing their presence and enhancing their ability to capture prey that includes a variety of wildlife species, most notably juvenile Mojave desert tortoises. Application of APLIC recommendations (APLIC 2006 and 2012), could reduce the likelihood of collisions and electrocutions of birds during Project operations. An APP/BBCS (APM-BIO-21 and BMP-BIO-29), required for the Project, would include a monitoring program to determine the effectiveness of the design to protect birds that utilize power lines and structures for perching and nesting, and to establish implementation measures for the use of flight diverters and other means to make lines more visible to reduce bird collisions. The guyed V structures, up to 190 feet tall, require four guy wires for support. Guy wires are often difficult for birds to detect and represent a continuing collision hazard for birds, and to a lesser extent, bats.

Assuming that a Vegetation Management Plan (APM/BMP-BIO-11), Habitat Restoration Plan (AMP/BMP-BIO-15), and Noxious Weed Management Plan (APM-BIO-12) are thorough and effectively implemented, and that the same APMs and BMPs are implemented as for Project construction continue throughout the Project Area during operations, maintenance, and decommissioning:

- Project operations may result in minor impacts to wildlife resources;
- Project maintenance may result in minor impacts to wildlife resources; and
- Project decommissioning may result in moderate impacts to wildlife resources.

4.5.6 Mitigation Measures

The applicant has committed to APMs, and the BLM developed required BMPs that would further reduce impacts to biological resources. Requirements for compensatory mitigation would be determined in coordination with micrositing and final design, and could include habitat improvement, payment of an in-lieu fee, acquiring mitigation land or conservation easements; or a combination of thereof. A Compensation Plan (MM-BIO-01) for permanent loss of habitat would be developed to meet BLM requirements and approval. The Compensation Plan would include calculations of compensation ratios and mitigation acreages for permanent loss of habitat for special status and protected native plant species, special status plant communities, Mojave desert tortoise, and any other biological resource requiring additional mitigation.

4.5.7 Construction of Full Route Alternative and Subalternative Effects

Tables 4.5-7 and 4.5-8 summarize disturbance information for each of the full route alternatives individually discussed in the following sections.

Table 4.5-7 Acres of Long-term Disturbance and Distance of Line Associated with each Project Full Route Alternative

ALTERNATIVE	LINE MILES	LONG-TERM DISTURBANCE[1] (ACRES)
Proposed Action	114.3	1,084.3
Alternative 1	111.6	1,003.2
Alternative 2	125.8	1,179.3
Alternative 3	123.0	1,197.3
Alternative 4	120.3	1,195.5

[1] For purposes of the analysis for biological resources, long-term disturbance combines short-term disturbance reported in Chapter 2 plus acres of access disturbance that was included with permanent disturbance.

The acres of Harwood’s eriastrum and Mojave fringe-toed lizard habitat estimated to be impacted based on Project-specific mapping of presumed habitat on the Palo Verde Mesa would likely provide a more accurate assessment of actual acres impacted by alternative (Table 4.5-5), and these acres identified where impacts may occur have not been subject to micrositing adjustments. However, no similar range-wide assessment of Harwood’s eriastrum and Mojave fringe-toed lizard habitat is available. The Project habitat mapping of suitable acres impacted shown in Table 4.5-8 also applies to the Mojave fringed-toes lizard as the habitats are identical.

Table 4.5-8 Acres and Percent of Harwood's Eriastrum Impacted by Project Activities as Modeled by the DRECP and Acres of Suitable Habitat by Project Alternative

PROJECT ALTERNATIVE	PROJECT HABITAT MAPPING	DRECP DISTRIBUTION MODEL 288,404 ACRES RANGE-WIDE	
	SUITABLE ACRES IMPACTED*	PROJECT ACRES IMPACTED*	PERCENT OF TOTAL DRECP ACRES
Proposed Action	3.3	23.2	0.008
Alternative 1	27.3	35.9	0.012
Alternative 2	27.3	60.2	0.021
Alternative 3	27.3	35.9	0.012
Alternative 4	27.3	35.9	0.012

* Prior to micrositing to reduce impacts.

4.5.7.1 Proposed Action

Impacts to biological resources from implementation of the Proposed Action would range from negligible to major. Descriptions of the impacts common to all alternatives and implementation of all APMs, BMPs, and mitigation common to all alternatives apply and are not repeated here.

<u>Vegetation</u>

The entire length of the Proposed Action route would parallel the existing DPV1 line and unimproved roads, as well as an adjacent buried pipeline for much of the way. The impacts from past vegetation removal during construction of DPV1 in 1982 is evident, with perhaps limited success of restoration efforts. The Proposed Action would add to this disturbance and loss of vegetation but would not really extend it into otherwise undisturbed areas, since the Project would occur immediately adjacent to existing disturbance areas. Invasive species such as Russian thistle, annual brome grasses, and non-native mustards are present along the existing linear facilities, limiting the likelihood that the Proposed Action would lead to infestations in areas where these plants are not already present, though the Project may contribute to their increased abundance. The Proposed Action would not affect microphyll wash habitat (Table 4.5-4). Protected native plants would be avoided or salvaged, and impacts to the sand dune habitat of Harwood's eriastrum would be minimized by following Segments p-17 and p-18. Approximately 0.6 mile of proposed access roads would cross suitable Harwood's eriastrum habitat under the Proposed Action; in total, approximately 3.3 acres of suitable habitat would be impacted by Project activities (Tables 4.5-5 and 4.5-8). Application of APMs and BMPs would protect the plant from loss of individuals and maintain the ecological processes (e.g., sand transport) that sustain its habitat; therefore, these impacts would be negligible to minor. The Proposed Action would have the least amount of Project mapped suitable acres and modeled acres of impacts to Harwood's eriastrum of all full route alternatives.

The Proposed Action would result in:

- Minor short-term and long-term impacts to native vegetation pending successful restoration;
- Negligible long-term impacts due to facilitating increased abundance of non-native plants; and
- Minor short- and long-term impacts of ground disturbance on protected and special status plants and plant communities.

Wildlife

Segment p-06 would cross the Kofa NWR. Development of Segment p-06 would disrupt desert bighorn sheep movement and habitat use within and outside the NWR, and incrementally increase habitat fragmentation in an area already impacted by the presence of high-voltage utility and buried pipeline corridors, including the DPV1, the El Paso Natural Gas line, the existing SCS, etc.

Segment p-06 crosses about 25 miles of good quality habitat for the Sonoran desert tortoise, and is within an extended use area of a reintroduced population of the endangered Sonoran pronghorn, which is afforded special management consideration on a NWR.

Segments p-10 and p-11 go through Copper Bottom Pass below Cunningham Peak. The rugged and remote Dome Rock Mountains surrounding Copper Bottom Pass are important for desert bighorn sheep and are often used as lambing grounds. Although a road, transmission line, and buried pipeline are present through Copper Bottom Pass, APM-BIO-18 is required to ensure that construction traffic in the pass is limited to only that which is necessary in order to minimize disturbance to desert bighorn sheep. In addition, APM-BIO-27 places seasonal restrictions on construction activities in desert bighorn sheep lambing areas, such as Copper Bottom Pass, to be determined annually by AGFD and BLM.

The proposed crossing of the Colorado River (Segment p-15e) is immediately north of the existing DPV1 crossing. Matching structure spacing and conductor heights with the existing line is expected to reduce the potential for birds to collide with the transmission line in this migratory bird flyway. Transmission lines over agricultural lands present a threat to the many birds that use agricultural lands and the associated water features. In these areas, conductor bundles would be in a horizontal, parallel configuration, and would match existing structure spacing and conductor heights to reduce the potential for bird collisions. On the Palo Verde Mesa, Segment p-17 and Segment p-18 approach the Mule Mountains, where some of the more suitable habitat for the threatened Mojave desert tortoise is found. Segments p-17 and p-18 avoids the best sand dunes used by the BLM sensitive species Mojave fringe-toed lizard, but crosses through 0.6 miles of habitat. The Proposed Action route parallels other high-voltage utility lines, buried pipeline, and established roads such that access to much of the Proposed Action corridor is already open to non-Project personnel; the exception is on Palo Verde Mesa where only limited access exists.

The Proposed Action would result in:

- Major long-term impacts to the management of the Kofa NWR, and to desert bighorn sheep and Sonoran pronghorn on the refuge;

- Minor short-term impacts to desert bighorn sheep in the Copper Bottom Pass area;
- Negligible long-term impacts to wildlife and habitats by facilitating increased recreational access to remote areas;
- Minor long-term impacts to wildlife habitat (especially Sonoran desert tortoise habitat in Kofa NWR) by contributing to an increase in abundance of non-native plants;
- Negligible short-term impacts to Mojave fringe-toed lizard due to possible mortality by Project activities;
- Negligible short- and long-term impacts to sensitive wildlife species, including nests of migratory birds; and
- Minor short- and long-term impacts to migratory birds due to potential collision hazard with structures, conductors, and guy lines.

4.5.7.2 Alternative 1: I-10 Route

Alternative 1 largely follows the I-10 corridor from the Delaney Substation to about the Colorado River. Alternative 1 would not include any helicopter fly yards. Impacts to biological resources from implementation of Alternative 1 would range from negligible to minor. All proposed APMs and BMPs apply except APM-BIO-18 because Alternative 1 does not go through Copper Bottom Pass, and APM/BMP-BIO-19 because the crossing of the Colorado River is not adjacent to existing high-voltage lines so matching conductor heights to reduce impacts to migratory birds is not applicable. Descriptions of the impacts common to all alternatives and mitigation common to all alternatives apply and are not repeated here.

Vegetation

Vegetation communities adjacent to and near the existing interstate highway corridor have largely been degraded by long-term impacts associated with easy access off of I-10; and commercial, residential, and agricultural development adjacent to I-10, including the presence of roads, canals, and various utility lines. Evidence of OHV use is present throughout, resulting in damage to and loss of vegetation. The interstate functions as a corridor for dispersal of non-native invasive plants. In California, rare plant alliances, including desert washes, are protected by setbacks of 200 feet. Alternative 1 would cross 0.5 acre of microphyll wash (Table 4.5-4); however, there would be a 200-foot setback and microphyll washes would be spanned through micrositing. Approximately 5.6 miles of proposed access roads would cross suitable Harwood's eriastrum habitat under Alternative 1; in total, approximately 27.3 acres of suitable habitat would be impacted by Project activities (Tables 4.5-5 and 4.5-8).Application of APMs and BMPs would protect the plant from loss of individuals and maintain the ecological processes (e.g., sand transport) that sustain its habitat; therefore, these impacts would be minor to moderate.

Alternative 1 access roads would cross more suitable Harwood's eriastrum habitat than the Proposed Action and the same as Alternatives 2 through 4; would have the same amount of Project-mapped suitable acres of impacts to Harwood's eriastrum as Alternatives 2 through 4; the same amount of modeled acres of impacts to Harwood's eriastrum as Alternatives 3 and 4; but fewer modeled acres of impacts than Alternative 2 (Tables 4.5-5 and 4.5-8).

The construction of Alternative 1 adjacent to the I-10 corridor, in addition to the current uses, would not alter the current situation regarding the overall degraded condition of vegetation resource. Segments ca-07, ca-09, and x-19 are more likely to encounter Harwood's eriastrum than the Proposed Action. Surveys would be conducted in all disturbance areas and plants would be avoided during construction, but there would likely be some loss of suitable habitat.

Alternative 1 would result in:

- Minor short- and long-term impacts to native vegetation pending successful restoration;
- Minor long-term impacts due to facilitating increased abundance of non-native plants, especially in dune habitats; and,
- Moderate short- and long-term impacts of ground disturbance on protected and special status plants and plant communities.

Wildlife

High traffic volume on interstate highways impact wildlife in many ways, including fragmenting habitat and impeding wildlife movement across the landscape; facilitating human access to adjacent areas resulting in disturbance to wildlife and damage to habitats, especially by off road vehicles; and causing repeated loss of individual animals to road mortality over the long-term, resulting in reduced population numbers. Alternative 1 goes through passes in the Plomosa Mountains and Dome Rock Mountains that are important wildlife movement corridors, especially for desert bighorn sheep. However, both of these passes are already impacted by I-10, utility lines, and pipelines. On the Palo Verde Mesa, Segments ca-07 and ca-09 cross about 3.5 miles of sand dunes, habitat for the Mojave fringe-toed lizard. Preconstruction exclusion surveys would be conducted to minimize possible mortality; impacts to habitat would recover due to lack of disruption of the sand transport corridor. Given the current status of wildlife populations and habitat along the majority of the Alternative 1 corridor, the additional impacts to wildlife from the development of Alternative 1 would largely be negligible.

In comparison to the Proposed Action, Alternative 1 would have no impact on the Kofa NWR because it would avoid the refuge; would impact only a minor amount of mostly degraded Sonoran desert tortoise habitat; and would not impact the Sonoran pronghorn. Potential impacts to desert bighorn sheep due to habitat fragmentation, impeding animal movement, and interference with lambing grounds would be reduced to negligible levels. The crossing of the Colorado River is not adjacent to the existing DPV1 line, creating an additional collision hazard for birds. Impacts to general wildlife and habitats would be negligible due to existing degraded habitat conditions.

Alternative 1 would result in:

- Negligible impacts to desert bighorn sheep;
- Negligible long-term impacts to wildlife and habitats by facilitating increased recreational access to remote areas;
- Minor short- and long-term impact to Mojave fringe-toed lizard due to possible mortality by Project activities and habitat impacts;

- Negligible short- and long-term impacts to sensitive wildlife species (excluding Mojave fringe-toed lizard), including nests of migratory birds;
- Negligible long-term impacts associated with contributing to an increase in abundance of non-native plants degrading wildlife habitat; and
- Minor short- and long-term impacts to migratory birds due to potential collision hazard with structures, conductors, and guy lines, and additional hazard at the Colorado River crossing.

<u>Subalternatives to Alternative 1</u>

Subalternatives 1A and 1B
Subalternatives 1A and 1B replace segments adjacent to I-10, but the subalternative segments are in areas where biological resources are largely degraded due to impacts associated with I-10, the CAP canal, numerous unpaved roads, agricultural and energy development, and long-term human presence. Both subalternatives would have a slightly greater, but still negligible impact to native vegetation communities and general wildlife habitat compared to Alternative 1. Other impacts of the subalternatives are similar to Alternative 1. The impacts of Subalternative 1A and Subalternative 1B are similar.

Subalternatives 1C and 1D
Using these subalternatives to move Project segments to the opposite side of I-10 through the pass in the Plomosa Mountains would result in the same impacts to biological resources as Alternative 1.

Subalternative 1E
This subalternative provides different routing through agricultural areas on the California side of the Colorado River. The impacts to biological resources would be the same as described for Alternative 1.

4.5.7.3 Alternative 2: BLM Utility Corridor Route

Alternative 2 would generally follow the I-10 and US 95 corridors, then proceed through Copper Bottom Pass, and cross the Colorado River and Palo Verde Mesa. Impacts to biological resources from implementation of Alternative 2 would range from negligible to minor. Descriptions of the impacts common to all alternatives and mitigation common to all alternatives apply and are not repeated here.

<u>Vegetation</u>

Alternative 2, where it is parallel to I-10 and US 95, would have similar impacts to vegetation as described for Alternative 1 following the I-10 corridors. Alternative 2 impacts to vegetation through Copper Bottom Pass would be as described for the Proposed Action.

Alternative 2 on the Palo Verde Mesa is almost twice as long as either the Proposed Action or Alternative 1, adding Segments x-15 and x-16 to the other segments included in Alternative 1. Segments x-15 and x-16 pass through sandy soil habitat, though not active dunes. Together these segments are 3.7 miles in length and intersect approximately 0.8 mile of the Pleuraphis rigida (*big galleta*) Alliance, which would be protected by a 200-foot setback. Alternative 2 would cross 2.6

acres of microphyll wash (Table 4.5-4); however, there would be a 200-foot setback and microphyll washes would be spanned through micrositing. Approximately 5.6 miles of proposed access roads would cross suitable Harwood's eriastrum habitat under Alternative 2; in total, approximately 27.3 acres of suitable habitat would be impacted by Project activities (Tables 4.5-5 and 4.5-8). Application of APMs and BMPs would protect the plant from loss of individuals and maintain the ecological processes (e.g., sand transport) that sustain its habitat; therefore, these impacts would be minor to moderate.

Alternative 2 access roads would cross more suitable Harwood's eriastrum habitat than the Proposed Action and the same as Alternatives 1, 3, and 4; would have the same amount of Project mapped suitable acres of impacts to Harwood's eriastrum as Alternatives 1, 3, and 4; and more modeled acres of impacts to Harwood's eriastrum as Alternatives 1, 3, and 4 (Table 4.5-8).

However, surveys for vegetation would be conducted in all disturbance areas and sensitive plants and rare alliances would be avoided. The increase in Project activities on Palo Verde Mesa may also further facilitate the spread of non-native plant species.

Alternative 2 would result in:

- Minor short- and long-term impacts to native vegetation pending successful restoration; Minor long-term impacts due to facilitating increased abundance of non-native plants, especially in dune habitats; and,
- Moderate short- and long-term impacts of ground disturbance on protected and special status plants and plant communities.

<u>Wildlife</u>

As discussed for Alternative 1, wildlife resources associated with Project segments along highways have been impacted in many ways, resulting in reduced populations of most wildlife species. Alternative 2, similar as with Alternative 1, parallels I-10 through the pass in the Plomosa Mountains—an important desert bighorn sheep movement corridor. Alternative 2, similar to the Proposed Action, would go through Copper Bottom Pass below Cunningham Peak, a rugged and remote area used by desert bighorn sheep, including as a lambing area. APM-BIO-18 and APM-BIO-27 are intended to minimize disturbance to desert bighorn sheep in the Copper Bottom Pass area.

In comparison to the Proposed Action, Alternative 2 would have no direct impact on the Kofa NWR because the route avoids the refuge and is adjacent to I-10; would have negligible impacts to the Sonoran pronghorn; would impact a minor amount of Sonoran desert tortoise habitat in the Plomosa and Dome Rock mountains; and avoid habitat for the Mojave desert tortoise near the Mule Mountains. Due to the increased length of Alternative 2 over that of Alternative 1, the possibility that shifting patches of Mojave fringe-toed lizard habitat may be impacted is increased.

Alternative 2 would result in:

- Minor short-term impacts to desert bighorn sheep in the Copper Bottom Pass area;
- Minor short- and long-term impacts to Mojave fringe-toed lizard due to possible mortality by Project activities and habitat impacts;

- Negligible short- and long-term impacts to sensitive wildlife species (excluding Mojave fringe-toed lizard), including nests of migratory birds;
- Minor long-term impact to wildlife habitat by contributing to an increase in abundance of non-native plants, especially in dune habitat; and,
- Minor short- and long-term impacts to migratory birds due to potential collision hazard with structures, conductors, and guy lines.

Subalternatives to Alternative 2

Subalternative 2A
Segments associated with Subalternative 2A cross the alluvial fan of the Eagletail Mountains where Sonoran desertscrub communities are well represented, though there are unpaved roads, canals, utility corridors, and evidence of past agriculture and other ground disturbance. Subalternative 2A replaces Segment p-01. Segment p-01 passes through habitats largely impacted by human activities and uses but also circles around Burnt Mountain at the south end of the Bighorn Mountains. Subalternative 2 would avoid potential disturbance associated with Segment p-01 at a developed wildlife water in the Big Horn Mountains that may be used by desert bighorn sheep, and avoid crossing a desert bighorn sheep dispersal corridor between Burnt Mountain and the Big Horn Mountains.

Subalternative 2B
Subalternative 2B includes several short segments that pass through Sonoran desertscrub habitat that has been impacted by various human activities, developments, and other ground disturbance. Habitat suitability improves for Sonoran desert tortoise closer to the Eagletail Mountains, near the junction of Segment p-04 and Segment x-03. Overall, impacts are substantially similar to Alternative 2.

Subalternative 2C
This subalternative route turns from Copper Bottom Pass near the head of Johnson Canyon north of Cunningham Peak into a rugged and remote portion of the Dome Rock Mountains. The area is in largely pristine condition, with few unimproved roads leading to the toe slope of the mountains. This is prime desert bighorn sheep habitat, often used for lambing grounds. The increased human presence associated with constructing and operating the line could interfere with wildlife use of the developed wildlife water in Johnson Canyon. Development of Subalternative 2C could increase public access into remote habitats and could permanently alter the character and function of the area for wildlife. Subalternative 2C would result in substantially more impacts to biological resources than Alternative 2, which is parallel to existing development through Copper Bottom Pass.

Subalternative 2D
Subalternative 2D runs parallel to the Alternative 2 alignment on the opposite side of Copper Bottom Pass. Project impacts of Subalternative 2D would be similar to those described for Alternative 2.

Subalternative 2E
Subalternative 2E replaces Segments p-16 and x-16 with Segments x-13 and ca-02, thereby decreasing the distance of Project segments on the Palo Verde Mesa by about 2.25 miles. This

reduces potential impacts to an extensive stand of the *Pleuraphis rigida* (big galleta) Alliance. By excluding Segment ca-02, Subalternative 2E avoids crossing small patches of the *Pleuraphis rigida* (big galleta) Alliance, and the *Prosopis glandulosa* (honey mesquite) Alliance. Impacts of Subalternative 2E is slightly less than the impacts described for Alternative 2.

4.5.7.4 Alternative 3: Avoidance Route

Alternative 3 would generally follow the existing DPV1 line from the Delaney Substation, then parallel I-10 through the pass in the Plomosa Mountains. The route turns south and proceeds about 10 miles along the west side of the Plomosa Mountains to join the existing DPV1 line west to Copper Bottom Pass where it leaves the pass to cross through the Dome Rock Mountains, and then crosses the Colorado River and Palo Verde Mesa. Impacts to biological resources from implementation of Alternative 3 would range from negligible to major. All APMs and BMPs apply except APM/BMP-BIO-19 because the crossing of the Colorado River is not adjacent to existing high-voltage lines so matching conductor heights to reduce impacts to migratory birds is not applicable. Descriptions of the impacts common to all alternatives and mitigation common to all alternatives apply and are not repeated here.

<u>Vegetation</u>

Impacts to vegetation from Alternative 3 would be as described for the Proposed Action from the Delaney Substation to where Alternative 3 would diverge from following the existing DPV1 line and proceed north to the I-10 corridor. Along I-10, Alternative 3 would have the same impacts as described for Alternative 1. When Alternative 3 turns south along the Plomosa Mountains it does not follow an existing utility corridor. Though there are unpaved roads crossing this segment, new, albeit temporary, access roads and work areas would impact existing Sonoran desertscrub communities where similar impacts have not occurred. Disturbance to soils could increase the possibility of spreading non-native plants to the area. Alternative 3 impacts to vegetation are similar to the Proposed Action from US 95 to Copper Bottom Pass.

Alternative 3 turns from Copper Bottom Pass near Cunningham Peak, passing high on the mountain slope into a rugged and remote portion of the Dome Rock Mountains. The area is in largely pristine condition, with few unimproved roads leading to the toe slope of the mountains. Construction of Alternative 3 would remove native vegetation and could facilitate spread of non-native plants into an area that has had little impact from human activities. From the Colorado River crossing to the substation, the impacts of Alternative 3 to vegetation resources are similar to that described for Alternative 1. Alternative 3 would cross 0.5 acre of microphyll wash (Table 4.5-4); however, there would be a 200-foot setback and microphyll washes would be spanned through micrositing. Approximately 5.6 miles of proposed access roads would cross suitable Harwood's eriastrum habitat under Alternative 3; in total, approximately 27.3 acres of suitable habitat would be impacted by Project activities (Tables 4.5-5 and 4.5-8).Application of APMs and BMPs would protect the plant from loss of individuals and maintain the ecological processes (e.g., sand transport) that sustain its habitat; therefore, these impacts would be minor to moderate.

Alternative 3 access roads would cross more suitable Harwood's eriastrum habitat than the Proposed Action and the same as Alternatives 1, 2, and 4; would have the same amount of Project mapped suitable acres of impacts to Harwood's eriastrum as Alternatives 1, 2, and 4; but less modeled acres of impacts than Alternative 2 (Table 4.5-8).

Alternative 3 would result in:

- Moderate short-term impacts to native vegetation due to ground disturbance during construction pending restoration, and moderate long-term impacts to vegetation in areas where no linear facilities and few roads exist;
- Moderate long-term impacts due to facilitating spread and increased abundance of non-native plants into new areas, especially into the Dome Rock Mountains and dune habitats;
- Moderate short- and long-term impacts of ground disturbance on protected and special status plants and plant communities; and
- Moderate short- and long-term impacts in areas where there are no existing linear facilities and few roads resulting in impacts to near-pristine examples of desert wash communities.

Wildlife

Impacts to wildlife from implementation of Alternative 3 would be similar to effects described for the Proposed Action and Alternative 1, with the exception of Segment x-05 along the west side of the Plomosa Mountains, and Segments cb-01, cb-04, and cb-05 that pass near Cunningham Peak to cross the Dome Rock Mountains.

Segment x-05 passes mostly north-south along the foothills and alluvial fan on the west side of the Plomosa Mountains. Though close to the LTVA, and the presence of numerous unimproved roads, various special status species may occur in the Sonoran desertscrub habitat within the corridor, mostly due to proximity of the Plomosa Mountains. Golden eagle, Sonoran pronghorn, Gila monster, elf owl, gilded flicker, and Lucy's warbler may be present.

Segment cb-01 passes high on the remote, steep mountain slopes of Cunningham Peak. Segment cb-04 crosses the Dome Rock Mountains through largely undisturbed desert wash vegetation that likely provides habitat for special status species such as Sonoran pronghorn, Gila monster, Sonoran desert tortoise, and Lucy's warbler. Segment cb-05 passes between the west side of the Dome Rock Mountains and the Colorado River in an area with very harsh desert conditions and large areas of desert pavement. There are few roads into this area of the Dome Rock Mountains, which is in largely pristine condition. The area is prime desert bighorn sheep habitat, which is often used for lambing grounds. Development of Alternative 3 could facilitate public access that would increase disturbance to wildlife in these remote habitats and may permanently alter the character and function of the area for wildlife, especially desert bighorn sheep.

In comparison to the Proposed Action, Alternative 3 would have no direct impact on the Kofa NWR because the route avoids the refuge and would have reduced impacts to the Sonoran pronghorn. Implementation of Alternative 3 would result in:

- Major long-term impacts to desert bighorn sheep in the Dome Rock Mountains by degrading nearly pristine habitat and facilitating increased recreational access to remote areas;
- Minor short- and long-term impacts to Sonoran pronghorn due to the vicinity to Kofa NWR;

- Minor short- and long-term impacts to Mojave fringe-toed lizard due to possible mortality by Project activities and habitat impacts;
- Negligible short- and long-term impacts to sensitive wildlife species (excluding Mojave fringe-toed lizard), including nests of migratory birds;
- Moderate long-term impact to wildlife habitat by contributing to an increase in abundance of non-native plants into remote areas and dune habitat; and
- Minor short- and long-term impacts to migratory birds due to potential collision hazard with structures, conductors, and guy lines, and additional hazard at the Colorado River.

<u>Subalternatives to Alternative 3</u>

Subalternative 3A
From the Delaney Substation, Segment d-01 passes through approximately 5 miles of active agricultural lands, and then crosses the alluvial fan of the Eagletail Mountains where there is good representation of Sonoran desertscrub communities, and where special status species such as Sonoran pronghorn, Sonoran desert tortoise, Gila monster, and LeConte's thrasher could be expected to occur. Unpaved roads and utility corridors pass through this area. Segments x-02a and x-02b are short segments near the I-10, CAP canal, and utility corridors; and Segment i-02 parallels I-10. Overall, the habitats crossed by this subalternative have been heavily impacted by long-term exposure to human activities and developments. The type and magnitude of effects are mostly similar to that of replaced Segments p-01 and Segment i-01 that follow existing utility corridors and I-10; however, the exception is that p-01 crosses a wildlife movement corridor between Burnt Mountain and the Bighorn Mountains and comes within 0.1 mile of a wildlife water that may be used by mule deer.

Subalternative 3B
The impacts of this subalternative are basically the same as Alternative 3, with all segments in proximity to human activities and developments including 1-10, CAP canal, unimproved roads, utility corridors, and various land disturbing actions.

Subalternative 3C
This subalternative extends more than 22 miles across the desert, from the northwest corner of the Eagletail Mountains to just south of I-10 near the Bear Hills south of the town of Brenda. The segment follows an existing unimproved road and buried pipeline, but largely passes through good quality Sonoran desertscrub habitats before reaching the I-10 corridor, providing habitat for diverse Sonoran desert biotic communities, which include habitat for the Sonoran pronghorn, Gila monster, LeConte's thrasher, and kit fox. Subalternative 3C would result in substantially greater impacts than Alternative 3, where habitats have been degraded adjacent to I-10.

Subalternative 3D
Subalternative 3D parallels I-10 on the north side through the pass in the Plomosa Mountains, habitat for desert bighorn sheep. Alternative 3 follows on the south side of I-10. Impacts to biological resources would be the same for Subalternative 3D and Alternative 3. Habitat for desert bighorn sheep and Sonoran desert tortoise occurs throughout the Plomosa Mountains, and the pass provides an important linkage for wildlife between large blocks of habitat on both sides of the interstate.

Subalternative 3E, 3G, and 3J

There is little difference in the impacts to biological resources between Subalternative 3E, Subalternative 3G, Subalternative 3J, and Alternative 3. Segments have been subject to long-term disturbance due to the highway, traffic, utility lines, and presence of people, including the LTVA. The Sonoran desertscrub community would largely be inhabited by low densities of common wildlife species.

Subalternative 3F

Subalternative 3F follows the east perimeter of the BLM LTVA, an area disturbed by persistent human presence and subject to high levels of recreation use, including OHV use. Subalternative 3F would replace Segment x-05 of Alternative 3 that passes along the foothills and alluvial fan on the west side of the Plomosa Mountains. Various special status species may occur in the Sonoran desertscrub habitat within the corridor, mostly due to its proximity to the Plomosa Mountains. Implementing Subalternative 3F would result in a reduction of impacts to vegetation and wildlife resources.

Subalternative 3H

Subalternative 3H loops around the north side of Quartzsite, crossing US 95 just north of residential developments (a little over 2 miles north of I-10). There are various unimproved roads and persistent recreation use throughout the area, though portions of the segment include Sonoran desertscrub habitat expected to support moderate densities of common wildlife species as well as the potential for special status species such as Sonoran pronghorn, Gila monster, and kit fox. As compared to Alternative 3, Subalternative 3H would reduce impacts to plant and wildlife resources by not utilizing Alternative 3 Segment x-05, which passes close to the Plomosa Mountains through good quality desertscrub habitat where several special status species may be present, and the area has not been impacted by linear facilities and developments.

Subalternative 3K

Similar to Alternative 3, Subalternative 3K passes through the remote, rugged slopes at Cunningham Peak and Johnson Canyon in the Dome Rock Mountains. The consequence of either option is the same—major adverse impacts to desert bighorn sheep and other wildlife in this near-pristine area.

Subalternative 3L

This subalternative would replace Alternative segments that would go through Copper Bottom Pass. There would not be any helicopter fly yards under Subalternative 3L. Impacts to wildlife, especially to desert bighorn sheep, would be reduced by moving the Project out of Copper Bottom Pass, which is important to desert bighorn sheep as a movement corridor, potential lambing area, and wildlife water location. Impacts across the desert habitats between the Dome Rock Mountains and Colorado River are similar for Subalternative 3L and Alternative 3.

Subalternative 3M

Potential impacts to biological resources from Subalternative 3M and Alternative 3 are very similar through the agricultural area just west of the Colorado River. At the river crossing, Subalternative 3M would cross adjacent to an existing high-voltage line, where matching conductor height and structures could reduce potential collision by birds, affording a benefit to migratory birds.

4.5.7.5 Alternative 4: Public Lands Emphasis Route

Alternative 4 heads west from the Delaney Substation through agricultural lands, and then crosses the alluvial fan of the Eagletail Mountains parallel to a buried natural gas pipeline, proceeding from the northwest corner of the Eagletail Mountains to just south of I-10 near the Bear Hills south of the town of Brenda. Following the I-10 corridor to just west of the pass through the Plomosa Mountains, it turns south to parallel the existing DPV1 line west into Copper Bottom Pass. It leaves the pass and crossing through the Dome Rock Mountains, crosses the Colorado River, and joins the Colorado River Substation. Descriptions of the impacts common to all alternatives and mitigation common to all alternatives apply and are not repeated here.

Vegetation

There is good representation of Sonoran desertscrub communities west of the Delaney Substation, past the agricultural fields and across the alluvial fan of the Eagletail Mountains. The area has been impacted by a buried natural gas pipeline and roads and has scattered invasive species such as red brome and non-native mustards. Alternative 4 continues through another 20 miles of good quality desert habitats to where it turns to parallel I-10. After entering Copper Bottom Pass, the route turns near the head of Johnson Canyon north of Cunningham Peak into a rugged and remote portion of the Dome Rock Mountains. The area is in largely pristine condition, with well represented desert wash vegetation and few unimproved roads leading to the toe slope of the mountains. Development of Alternative 4 may facilitate spread of invasive plant species to this very remote area, which could be exacerbated by increased access to the area by recreationists.

Alternative 4 would cross 0.5 acre of microphyll wash (Table 4.5-4); however, there would be a 200-foot setback and microphyll washes would be spanned through micrositing. Approximately 5.6 miles of proposed access roads would cross suitable Harwood’s eriastrum habitat under Alternative 4; in total, approximately 27.3 acres of suitable habitat would be impacted by Project activities (Tables 4.5-5 and 4.5-8). Application of APMs and BMPs would protect the plant from loss of individuals and maintain the ecological processes (e.g., sand transport) that sustain its habitat; therefore, these impacts would be minor to moderate. Alternative 4 access roads would cross more suitable Harwood’s eriastrum habitat than the Proposed Action and the same as Alternatives 1, 2, and 3; would have the same amount of modeled acres of impacts to Harwood’s eriastrum as Alternatives 1 and 3; but fewer modeled acres of impacts than Alternative 2 (Table 4.5-8).

Alternative 4 could result in:

- Moderate short- and long-term impacts to native vegetation pending restoration, and increased degradation of existing good quality habitats;
- Moderate long-term impacts due to facilitating spread and increased abundance of non-native plants into new areas, especially into the Dome Rock Mountains and dune habitats; and,
- Moderate short- and long-term impacts of ground disturbance on protected and special status plants and plant communities.

Wildlife

Alternative 4 extends across more than 40 miles of desert from north of the Eagletail Mountains to I-10 near the Bear Hills south of the town of Brenda. Though impacts exist throughout the areas, and habitat quality varies, there is good representation of quality Sonoran desertscrub vegetation, providing habitat for diverse Sonoran desert biotic communities, which include Sonoran pronghorn, Gila monster, LeConte's thrasher, and kit fox. In Copper Bottom Pass, in the vicinity of Cunningham Peak at the head of Johnson Canyon, Alternative 4 leaves the existing utility corridor to cross a steep, rugged, and remote portion of the Dome Rock Mountains. The area is in largely pristine condition, with few unimproved roads. The canyons and drainages of the mountains extending to the alluvial fans support desert wash communities likely providing habitat for special status species such as Sonoran pronghorn, Gila monster, Sonoran desert tortoise, and Lucy's warbler. These steep mountain slopes provide prime desert bighorn sheep habitat, and they are often used for lambing grounds. Because Alternative 4 would bring human presence and noise closer to a developed wildlife water in Johnson Canyon used by desert bighorn sheep and mule deer, some animals may experience more stress as they seek water elsewhere. Development of Alternative 4 could lead to degraded habitat conditions by facilitating the spread of non-native vegetation, increase public access into remote habitats resulting in disturbance to wildlife, and may permanently alter the character and function of the area for wildlife, especially desert bighorn sheep.

Because Alternative 4 leaves the existing DPV1 corridor and crosses into near-pristine desert bighorn sheep habitat, the impacts to wildlife associated with Alternative 4 are substantially greater than the Proposed Action.

Implementation of Alternative 4 would result in:

- Major long-term impacts to desert bighorn sheep in the Dome Rock Mountains by degrading nearly pristine habitat and facilitating increased recreational access to remote areas;
- Minor short-term impacts to Sonoran pronghorn south of I-10;
- Minor short- and long-term impacts to Mojave fringe-toed lizard due to possible mortality by Project activities and habitat impacts;
- Negligible short- and long-term impacts to sensitive wildlife species (excluding Mojave fringe-toed lizard), including nests of migratory birds;
- Moderate long-term impact to wildlife habitat by contributing to an increase in abundance of non-native plants into remote areas and dune habitat;
- Minor short- and long-term impacts to migratory birds due to potential collision hazard with structures, conductors, and guy lines.

Subalternatives to Alternative 4

Subalternative 4A
The impacts of Subalternative 4A are very similar to that of Alternative 4. These segments follow existing disturbances as well as include somewhat degraded desertscrub habitats. However, the subalternative Segment p-01 crosses a wildlife movement corridor between Burnt Mountain and

the Bighorn Mountains parallel to the existing DPV1 line and comes within 0.1 mile of a wildlife water that may be used by desert bighorn sheep and mule deer, resulting in a slight increase of impacts to biological resources.

Subalternative 4B
This subalternative follows the I-10 corridor through generally degraded habitat, while Alternative 4 crosses more than 22 miles of desert habitat in mostly moderate to good condition. Subalternative 4B would result in a minor reduction of impacts to biological resources when compared with Alternative 4.

Subalternative 4C
This subalternative parallels I-10 and would not contribute to any substantial new impacts.

Subalternative 4D
Subalternative 4D passes along the foothills and alluvial fan on the west side of the Plomosa Mountains. Various special status species may occur in the Sonoran desertscrub habitat within the corridor, mostly due to its proximity to the Plomosa Mountains. This subalternative would replace Segment x-06 that follows the east perimeter of the LTVA, an area disturbed by persistent human presence and subject to high levels of recreation use, including OHV use. Implementing Subalternative 4D would result in additional impacts to vegetation and wildlife resources than would occur under Alternative 4.

Subalternative 4E
Subalternative 4E as well as Alternative 4 pass through remote, rugged slopes at Cunningham Peak and Johnson Canyon in the Dome Rock Mountains. The consequence of either option is the same—major adverse impacts to desert bighorn sheep and other wildlife in this near-pristine area.

Subalternative 4F
This subalternative would have similar impacts as Alternative 4 in that both routes cross similar habitat between the Dome Rock Mountains and Colorado River. However, Subalternative 4F (Segment cb-05) impacts approximately 1 mile less habitat than Alternative 4 (Segment cb-06 and Segment p-13) resulting in slightly less impact to biological resources.

Subalternative 4G
Subalternative 4G would extend through Copper Bottom Pass, an area important to desert bighorn sheep, but one that has existing impacts due to roads, a buried pipeline, and the DPV1 line. Because Alternative 4 leaves the exiting corridor in Copper Bottom Pass and crosses into near-pristine desert bighorn sheep habitat, the impacts to wildlife associated with Subalternative 4G are substantially less than Alternative 4.

Subalternatives 4H, 4J, 4K, 4L, 4M, and 4N
These subalternatives largely follow I-10, or cross agricultural areas, and would have fewer impacts than Alternative 4. Subalternatives 4K and 4L cross the Colorado River in areas not adjacent to the existing DPV1 line and may result in a greater collision hazard to birds.

Subalternative 4P
Subalternative 4P approaches the Colorado River Substation from the southeast following the DPV1 line, approaching the vicinity of the Mule Mountains where some of the more suitable habitat for the threatened Mojave desert tortoise is found. This subalternative replaces segments

of Alternative 4 that approach the substation from the north where there is occupied habitat for the Mojave fringe-toed lizard and Harwood's eriastrum. Potential impacts of Subalternative 4P to biological resources are substantially less than for Alternative 4.

4.5.8 Residual Impacts

APMs and BPMs would not alleviate all environmental impacts to vegetation. Residual impacts of this Project would include a permanent loss of vegetation due to the development of access roads, structure pads, and other permanent facilities resulting in a loss of wildlife breeding and foraging habitat. The likelihood of increased vehicle use on access roads and increased access into remote habitats could result in disturbance to wildlife. Additional residual impacts would result from the loss of plant primary production due to clearing of temporary work areas pending restoration efforts. In harsh desert conditions, the success of restoration often depends on rainfall, and slow growing vegetation may take many years (or decades) to achieve stature and function prior to ground clearing. The residual impacts to biological resources are not expected to be major, dependent to some degree on the selected route.

4.5.9 CDCA Compliance

Compliance with the CDCA is achieved through consistency with CMAs. Numerous LUPA CMAs have been determined to be applicable to the Project relative to the conservation of biological resources (Appendix 2C). Compliance with the CMAs is achieved through implementation of Project-specific APMs/BMPs addressing biological and vegetation resources (Appendix 2A, Section 2A.4) and the application of these measures is disclosed in Section 4.5.4.1.

Specific CMAs address Harwood's eriastrum and its dune habitat. These measures include implementing an avoidance setback of 0.25-mile from all occurrences of the plant to protect ecological processes and establishing a limit (cap) for impacts to suitable habitat to a maximum of 1 percent throughout all BLM lands included within the CDCA. However, based on the distribution of potentially suitable habitat on the Palo Verde Mesa, Harwood's eriastrum is expected to be present along all Project alternatives crossing the Palo Verde Mesa. Therefore, if Project design is not consistent with CMA specifications, exceptions can be allowed through an amendment to the CDCA Plan, as long as the goals established by the LUPA are met. Since it can be shown that the linear nature of the Project can avoid impacts to the ecological processes (i.e., sand movement) that support plant populations, and meet the goal of promotion of the ecological processes, the CDCA Plan is further amended to allow Project construction to proceed. Specific measures for the conservation on Harwood's eriastrum are required under the conditions of this amendment that are implemented through BMP-BIO-31.

Compliance with biological CMAs is demonstrated in Appendix 2C, with details of applicable APMs/BMPs provided in Appendix 2A, Section 2A.4.

4.5.10 Unavoidable Adverse Effects

Some environmental impacts resulting from the Project would be unavoidable. These impacts include increased mortality to avian species due to collisions with the transmission line and structure guy wires, and facilitating predation of small mammals, reptiles, and invertebrates by corvids and raptors that use transmission lines and structures as hunting perches. Mortality of fossorial wildlife is expected and mostly unavoidable during site clearing, and individual animals would be lost due to vehicle strikes during construction and maintenance activities. These unavoidable adverse effects to biological resources are not expected to be major.

4.5.11 Cumulative Effects

Development of the Project, in conjunction with past development and other current and foreseeable future projects (Table 3.20-5), would contribute incrementally to the ongoing fragmentation and loss of natural habitats, increased mortality for some wildlife species, increased spread and abundance of non-native plants, increased noise/vibration during construction activities, and increased human presence in remote areas. Cumulative effects to vegetation and wildlife would be additive and proportional to the amount of ground disturbance, and loss and degradation of habitat for each individual project. All Project alternatives would have similar cumulative impacts, though the degree of impact could vary depending on the selected segments (e.g., a new corridor in an otherwise near pristine area). Cumulative impacts on biological resources would be minimized through surveys, design, and engineering, as well as APMs and BMPs. Similar measures would likely be required for most future projects.

Where linear utilities are collocated, the cumulative impacts are generally less than when utility corridors follow separate routes. However, on the Palo Verde Mesa, new structures in addition to existing power lines, the Colorado River Substation, and solar energy development can cumulatively impact dune systems due to subtle changes in wind patterns and structures interrupting sand transport across the mesa.

In the case of the Kofa NWR, the proposed development of Segment p-06 would more than double the width of the existing utilities corridor resulting in greater fragmentation of habitat for desert bighorn sheep, Sonoran pronghorn, Sonoran desert tortoise, and other wildlife (USFWS 2017). Human activity associated with construction and maintenance, habitat disturbance and destruction, and visual separation caused by the transmission line can discourage wildlife from crossing the disturbed area and lead to greater fragmentation and isolation of the north part of the refuge from the remainder. The cumulative and incremental impacts of the Project in addition to the existing utilities may pose the greatest impact to the refuge (USFWS 2017).

The BLM sensitive plant species Harwood's eriastrum is restricted to active windblown sand dune habitat. The DRECP LUPA CMAs for sensitive plant species apply to Harwood's eriastrum, and include a cumulative limit (i.e., cap) for impacts to suitable habitat to a maximum of 1 percent from all projects throughout all BLM lands included within the DRECP. According to the DRECP distribution model for Harwood's eriastrum, there is 288,404 acres of Harwood's eriastrum habitat on BLM lands. Using the same model, Project-related ground disturbance on the Palo Verde Mesa with the implementation of Alternative 2 (the alternative with the greatest potential to impact Harwood's eriastrum) were calculated to potentially disturb 60.2 acres of Harwood's eriastrum habitat. Maximum Project-related impacts based on the DRECP model would constitute 0.021 percent of Harwood's eriastrum distribution range-wide, and this estimate for Project impact acres does not consider additional reduction in area of impact that would be achieved through micrositing. Other projects (Table 3.20-5) have occurred in Harwood's eriastrum modeled habitat on the Palo Verde Mesa and Chuckwalla Valley, and new structures in addition to existing power lines (e.g., DPV), the Colorado River Substation, and solar energy development (e.g., Desert Quartzsite Solar and gen-tie line) can cumulatively impact dune systems due to subtle changes in wind patterns and structures interrupting or altering sand transport across the mesa. Additional projects approved by BLM within Chuckwalla Valley together with the proposed Project may impact up to 373.8 acres of DRECP modeled habitat within Chuckwalla Valley; a total of 0.36 percent of modeled habitat in Chuckwalla Valley or 0.12 percent range-wide. The cumulative impact cap of 1 percent to DRECP modeled Harwood's eriastrum habitat is applied to the species' entire distribution on BLM lands. The sum of impacted habitat from these various projects on BLM land would not collectively approach the 1 percent cap (i.e., 2,884 acres) (impacts on private land to not contribute to calculation of the impact cap).

The Mojave fringe-toed lizard, also restricted to wind-blown sand habitats, would lose up to 60.2 acres of habitat due to Project implementation. Other BLM-approved projects within the Chuckwalla Valley resulted in loss of DRECP modeled habitat for the Mojave fringe-toed lizard, such as the Colorado River Substation (77.27 acres), Desert Sunlight (1,293.4 acres), and Genesis (1,035.21 acres), and together with the proposed Project (60.2 acres) would impact a total of 2,465.7 acres of DRECP modeled habitat, or 1.87 percent of all modeled Mojave fringe-toed lizard habitat in Chuckwalla Valley (i.e., 132,117.6 acres).

Overall the past, present, and reasonably foreseeable future actions in the CEA are expected to result in:

- Long-term minor cumulative impacts where the proposed segments would be collocated or near past/present disturbances and/or existing linear facilities with some exceptions.
- Major, long-term cumulative impacts where Segment cb-01, Segment cb-02, and Segment cb-04 would enter remote and near-pristine areas where existing linear facilities are not present.
- Major, long-term cumulative impacts would occur were Segment p-06 would be collocated with existing utility corridors across the Kofa NWR. The cumulative effect of expanding the width of the utility corridor would conflict with the purposes for which the NWR was established by interfering with wildlife movement and habitat use.

Overall, the contribution by the Project to cumulative impacts to biological resources is dependent on the selected route segments. Routes through the Kofa NWR (Segment p-06), and through the remote, near pristine areas of the Dome Rock Mountains (Segments cb-01, cb-02, cb-04) would result in a greater contribution to cumulative impacts because these segments would result in greater disruption to wildlife than previously disturbed routes where wildlife has been exposed to persistent disturbances, habitat has been degraded, and animal populations are often reduced. Such contributions would result in significant degradation of biological resources that could not be fully mitigated, and this would be a more notable loss of habitat because past and present projects have already limited the availability of pristine landscapes with uncompromised biological conditions. Cumulatively, the indirect effects of this Project that facilitate human access into remote landscapes has a greater consequence than the direct impact to habitat. Other route alternatives would make a small contribution to the total past, present, and reasonably foreseeable future disturbance in the CEA.

While many cumulative impacts to wildlife are foreseeable, the addition of the Project itself (excluding the Kofa NWR and pristine areas of the Dome Rock Mountains) when combined with other past, present, and reasonably foreseeable future actions, would not be the cause of a significant degradation of wildlife resources or affect the potential for wildlife resources, including special status species, to sustain current population levels. The Project's relatively short construction period (e.g., duration of disturbance), limited acres of permanent habitat loss, and implementation of all APMs/BMPs would be expected to result in generally minor effects limited to individual plants and animals within a localized area (i.e., no measurable population level impacts). The degree of change on a cumulative basis would be negligible once mitigation measures have been implemented and disturbed areas start to heal.

4.5.12 Irreversible and Irretrievable Commitment of Resources

Environmental impacts that have irreversible negative effects on vegetation are situations where vegetation and topsoil are impacted and not restored. In most cases, reclamation efforts would be made, and irreversible impacts to vegetation would be minor, including unavoidable adverse impacts and residual impacts.

4.5.12.1 Vegetation Communities

In areas of structure foundations, access roads, and SCS construction, vegetation communities and their habitat (topsoil) would be destroyed, but these areas would be minimal in extent, and vegetation community loss minimal relative to the acreage of each community in the region, and would focus on low-sensitivity or low-value communities. Vegetation would take many decades to recover in such locations and may never recover under current climate regimes without soil nutrient enhancements and multiple seedings.

4.5.12.2 Special Status Species

Although environments of special status species throughout the analysis area have been recognized and would be avoided to the greatest extent, avoidance of every individual of all special status species is unlikely. Where individuals would be impacted, reclamation should mitigate such impacts, but relocation to suboptimal habitats or inadequate habitat reclamation could result in permanent declines for the species in those locations.

4.5.12.3 Noxious Weeds

Despite reclamation and control efforts, introduction and colonization of noxious weeds and other exotic invasive plant species could occur and persist in some areas.

4.5.12.4 Wildlife

Irreversible and irretrievable commitment of wildlife resources would occur in cases of wildlife mortality due to collisions with construction equipment, transmission lines, or structures. No other irreversible and/or irretrievable commitments of wildlife would occur.

4.5.13 Relationship of Short-term Uses and Long-term Productivity

The productivity or function of vegetation would be affected by both short-term or temporary impacts, and long-term or permanent impacts.

4.5.13.1 Vegetation Communities

Temporary impacts to vegetation communities would be present until reclamation is conducted, resulting in short-term production loss. Following reclamation, temporary impact effects would be alleviated to vegetation communities and long-term productivity would be reestablished. However, even when vegetation is established during reclamation efforts, the composition of plant species in the recovery area is often different than the original vegetation community. Typically, grasses establish early on, whereas shrubs take much longer to reestablish. Because of the desert environment, reclamation and revegetation to pre-disturbance conditions is extremely difficult, if not impossible. Reclamation of herbaceous vegetation (e.g., perennial native grasses) should take less than 5 years, depending on weather during that time. Long-term establishment of native woody species (e.g., shrubs and riparian trees) would take longer periods of time, from 5 to 20 years to restore long-term woody vegetation productivity. Relative to temporary impacts that would include both short-term and long-term reclamation of native vegetation production, permanent loss of vegetation communities would be minimal in spatial scale. Vegetation of semi-arid regions generally takes years (herbaceous) to decades (woody) to recover from disturbances that impact the aboveground plants themselves, but not the topsoil. Such recovery is very dependent on rainfall and temperature conditions during the recovery period.

4.5.13.2 Special Status Species

As noted in Chapter 2, a Reclamation, Vegetation, and Monitoring Plan (Appendix 2B) would be prepared to address the reconstruction of disturbed ecosystems by returning the land to a stable and productive condition. If reclamation and relocation methods are employed for any special status plant species, the temporary impacts would be during the reclamation activities. Productivity of such plants would be reduced in the short term, but would be unaffected in the long term once such plants have become reestablished. Permanent impacts to those plant species (individuals) would be based on survival of transplanted individuals, and persistence of restored habitat. Long-term loss of productivity would result if such plants do not survive, or suffer reduced growth following relocation. Given the importance of special status species, all efforts would be made to ensure the survival and continued productivity levels of such plants.

The long-term loss of productivity related to Project activities to special status wildlife species would be similar as discussed for common wildlife species, below. The APMs and BMPs identified for general wildlife would apply to special status wildlife species minimizing Project-related impacts.

4.5.13.3 Noxious Weeds

The introduction and colonization of noxious weeds and other exotic invasive plant species would be minimized with implementation of monitoring and control.

4.5.13.4 Wildlife

Construction of the Project would result in some short- and long-term impacts to wildlife resources and habitat. During construction, breeding and foraging within the area may decrease due to temporary habitat loss, construction noise, and human presence. In addition, there may be increased mortality due to collisions with construction equipment. The decrease in productivity during construction would be expected to be short-term; breeding and foraging within the Project ROW would commence following construction activities. Long-term productivity of some species may be impacted by collisions with power lines, as well as by long-term habitat loss, and increased mortality due to predation. Some predator species, especially raptors and corvids, would benefit from the increase perches provided by the transmission line.

4.6 CULTURAL RESOURCES

4.6.1 Introduction

This analysis of cultural resources provides an overview of potential direct and indirect impacts by the construction, operation, maintenance, and decommissioning of the Project. As stated in the PA, given the length of time of the Project's operational life before being decommissioned, decommissioning is considered as a separate undertaking to be addressed by future Section 106 analyses. As noted in the PA, the ROW would stipulate, and the BLM shall ensure, that decommissioning would be considered a new action for Section 106 review, and that historic properties potentially affected by decommissioning would be considered in accordance with the pertinent laws, regulations, and policies extant at the time.

As defined in Section 3.6, *cultural resources* include archaeological sites; historic buildings, structures, or places; and places of traditional cultural or religious importance. Those cultural resources that demonstrate integrity and significance under Criteria A, B, C, and/or D (Section 3.6.1.1) of the NRHP, are further classified as *historic properties*. Those cultural resources that have not been previously evaluated for eligibility for the NRHP are treated as eligible for the purposes of this analysis.

The information presented herein is summarized from Class I baseline data and ethnographic information collected for the Project and reported in Brodbeck et al. (2017) and Leard and Brodbeck (2017), respectively. For the Project alternatives and subalternatives crossing the Colorado River and California Zone, this information is augmented by a cultural resources sensitivity analysis (Appendix 3B). The analysis contains discussion of the known sensitivity for cultural resources based on the results of prior investigations, the author's knowledge of the Project Area, and review of the BLM cultural resources database. The document was developed in compliance with LUPA-TRANS-CUL-4 and DFA-VPL-CUL-4. The sensitivity analysis is specific to Segments p-16, p-17, p-18, x-16, ca-02, x-15, ca-07, ca-09, and x-19; the results of the analysis are presented with those segments.

Many of the Project alternatives have been intensively surveyed for cultural resources by other projects in the past, so the Class I overview provides substantial information about the types and distribution of known cultural resources in the Project Area. The BLM is using the substantial available Class I data, sensitivity model, and ethnographic information, including feedback from the tribes, as baseline data to inform the analysis of alternatives to select the best route for the Project, should it be approved. This baseline information is presented in tabular format and discussed in Section 3.6 and provides the foundation for the impact analysis described below. Impacts are discussed in terms of direct effects (those caused by the action and occurring at the time of Project construction); and indirect effects (post-construction effects that result from the Project or effects that are farther removed in distance). A Class III inventory would be conducted on the selected route prior to issuance of the NTP for the Project per Section 106 requirements.

4.6.2 NHPA Section 106 Compliance

Federal agencies must demonstrate compliance with the NHPA (16 USC 470, et seq.). Section 106 of the NHPA requires a Federal agency with jurisdiction over a project to evaluate the effect of the proposed project on properties included on, or eligible for, the NRHP. The SHPOs and THPOs play important roles in the review of impacts on historic properties (places included in or eligible for inclusion in the NRHP) under Section 106 of the NHPA and its implementing regulations at 36 CFR § 800. Federal agencies must also provide the ACHP an opportunity to comment on the effects of the proposed project on historic properties. The BLM notified the ACHP on February 15, 2017 that the Project was likely to have an adverse effect and invited them to participate in consultations. ACHP declined in a letter dated March 9, 2017. The BLM requested that the ACHP participate as a party to the PA on January 11, 2018; and the ACHP accepted on January 25, 2018.

Any adverse effects that the Project or alternatives may have on historic properties would be resolved through compliance with the terms of a PA under Section 106 of the NHPA (16 USC Section 470). The PA serves as a legally binding document which contains the following information specific to the Project:

- Description of the undertaking
- Definition of the direct and indirect APEs
- Identification of signatories, invited signatories, and concurring parties to the PA
- Overview of the cultural resources regulatory requirements specific to the Project
- Definition of the roles and responsibilities of the Lead Agency (BLM)
- Definition of the roles and responsibilities of the Signatories
- Definition of the roles and responsibilities of the Invited Signatories
- Protocols for Tribal consultation
- Protocols, methods, and timeframes for Project identification efforts (i.e., Class I literature reviews, Class III survey, ethnographic overview and ethnographic assessment, historic building inventory, geo-archaeological assessment)
- Protocols, methods, and timeframes for the evaluation of cultural resources and determinations of eligibility and effect
- Protocols, methods, and timeframes for required reports (i.e., Historic Properties Treatment Plan [HPTP], Research Design and Work Plan)

- Avoidance measures
- Protocols for the resolution of adverse effects
- Activity-specific protocols for construction and operations and maintenance of the Project
- Overview of applicable standards and qualifications for cultural resources professionals and reporting guidelines
- Protocols for dispute resolution
- Protocols for annual reporting
- Protocols for amendment and termination of the PA
- Duration of the PA (sunset clause)

As defined in 36 CFR § 800.6, there are three tiers of participation in a PA document. *Signatories* have roles and responsibilities defined in the agreement, including the sole authority to execute, amend, or terminate the document. A PA cannot be executed without the signature of all parties identified as signatories to the agreement. *Invited Signatories* also have roles and responsibilities under the agreement, including the right to amend or terminate the document. However, the signature of an invited signatory is not required to execute the agreement. *Concurring Parties* are consulting parties that are invited to participate, but do not have roles or responsibilities under the terms of the agreement, nor do they have the power to amend or terminate the document. Signatures of concurring parties are not required to execute the document. Table 4.6-1 provides an inventory of the invited agencies and tribes, their participation status, and their level of participation in the development of the Ten West Link Draft PA. The ACHP was initially invited to participate as a signatory to the PA in February 2017. After BLM requested their participation in January 2018, the ACHP agreed to participate in the PA as a signatory.

Table 4.6-1 Participants in the Ten West Link Draft PA

AGENCY	PARTICIPATION STATUS	LEVEL OF PARTICIPATION
BLM	Participant	Signatory
California SHPO	Participant	Signatory
Arizona SHPO	Participant	Signatory
ACHP	Participant	Signatory
CRIT	Participant	Invited Signatory
BIA	Participant	Invited Signatory
DCRT LLC	Participant	Invited Signatory
ASLD	Participant	Invited Signatory
SLC	Declined to participate	Invited Signatory
Caltrans	Declined to participate	Invited Signatory
ADOT	Participant	Invited Signatory
USACE	Participant	Invited Signatory
Reclamation	Participant	Invited Signatory
YPG	Participant	Invited Signatory
CPUC	Participant	Invited Signatory
La Paz County	Participant	Invited Signatory
Town of Quartzsite	Participant	Invited Signatory

AGENCY	PARTICIPATION STATUS	LEVEL OF PARTICIPATION
ASM	Participant	Invited Signatory
Agua Caliente Band of Cahuilla Indians	Declined to participate	Concurring Party
Ak-Chin Indian Community	Participant	Concurring Party
Augustine Band of Cahuilla Indians	Declined to participate	Concurring Party
Cabazon Band of Mission Indians	Declined to participate	Concurring Party
Chemehuevi Tribe	Declined to participate	Concurring Party
Cocopah Indian Tribe	Participant	Concurring Party
Fort McDowell Yavapai Nation	Participant	Concurring Party
Fort Mojave Tribe	Participant	Concurring Party
Gila River Indian Community	Participant	Concurring Party
Hopi Tribe	Participant	Concurring Party
Morongo Band of Mission Indians	Participant	Concurring Party
Fort Yuma Quechan Tribe	Participant	Concurring Party
Salt River Pima-Maricopa Indian Community	Participant	Concurring Party
San Manuel Band of Mission Indians	Declined to participate	Concurring Party
Soboba Band of Luiseño Indians	Participant	Concurring Party
Tohono O'odham Nation	Participant	Concurring Party
Torres-Martinez Desert Cahuilla Indians	Participant	Concurring Party
Twenty-Nine Palms Band of Mission Indians	Participant	Concurring Party
Yavapai-Apache Nation	Participant	Concurring Party
Yavapai-Prescott Indian Tribe	Participant	Concurring Party
WAPA[1]	Participant	Concurring Party

[1]WAPA has no ground disturbing role in the Project and has requested to participate as a concurring party.

In their role as Lead Agency responsible for Project cultural resources compliance, the BLM developed the draft PA with assistance from agency and tribal stakeholders through a series of writing group meetings (Table 4.6-2). The draft PA developed through the writing group was distributed for review and comment to all consulting parties.

Table 4.6-2 Participation in the Draft PA Writing Group

DATE	ACTIVITY	AGENCY/ TRIBE/ GROUP
7/6/17	Initial conference call for writing group	AZ SHPO BLM DCRT LLC YPG CRIT Galileo[1]
8/15/17	Meeting in Parker, AZ	AZ SHPO BLM DCRT LLC YPG CRIT CPUC/Dudek Galileo[1]

DATE	ACTIVITY	AGENCY/ TRIBE/ GROUP
8/31/17	Conference call for writing group	AZ SHPO BLM DCRT LLC CRIT CPUC/Dudek Galileo[1]
10/24/17	Meeting in Parker, AZ	AZ SHPO BLM DCRT LLC CRIT CPUC/Dudek Fort Yuma Quechan Tribe Cultural Committee Galileo[1]
12/19/17	Meeting in Parker, AZ	AZ SHPO ACHP ASLD BLM CA SHPO CRIT CPUC/Dudek DCRT LLC La Paz County Fort Yuma Quechan Tribe Cultural Committee Reclamation Twenty-Nine Palms Band of Mission Indians Galileo[1]
4/17/18	Meeting in Parker, AZ	AZ SHPO ACHP ASLD BLM CRIT CPUC/Dudek DCRT LLC Fort Mojave Tribe Fort Yuma Quechan Tribe Cultural Committee Galileo[1]

[1] BLM's administrative/project management consultant (Galileo) participated as moderator for the Administrative Record. They are not a participant in the PA writing group.

[2] California SHPO was invited to participate.

During the development of the draft PA, several specific issues were identified that require resolution. The larger of these issues consist of:

- Decommissioning as a separate undertaking not covered under the provisions of the draft PA.
- How the Draft PA should incorporate or tier to the DRECP PA.

- CRIT disagrees with the review timeframe for reports and other documents, as these require Tribal Council approval.
- CRIT and the Fort Yuma Quechan Tribe disagree with provisions for curation of artifacts.
- CRIT disagrees with the preparation of Project documents, such as the Class III inventory report and the HPTP, occurring after the ROD.

The revised draft PA is included in Appendix 2D.

Implementation of the Project also would require local and state agencies in California to demonstrate compliance with CEQA, for which specific guidance regarding cultural resources is presented in Appendix K of the CEQA Guidelines. In Arizona, local and state agencies must comply with the Arizona antiquities laws.

Table 4.6-3 provides the list of consulting parties under Section 106.

Table 4.6-3 Section 106 Consulting Parties

FEDERAL	INDIAN	STATE AND LOCAL
ACHP	Ak-Chin Indian Community	ADOT
DOD YPG	Cocopah Indian Tribe	Arizona SHPO
BIA	CRIT	ASLD
Reclamation	Fort McDowell Yavapai Nation	ASM
USACE	Fort Mojave Tribe	California SHPO
	Gila River Indian Community	CPUC
	Hopi Tribe	DCRT
	Morongo Band of Mission Indians	La Paz County
	Fort Yuma Quechan Tribe	Town of Quartzsite
	Salt River Pima-Maricopa Indian Community	
	Soboba Band of Luiseño Indians	
	Tohono O'odham Nation	
	Torres-Martinez Desert Cahuilla Indians	
	Twenty-Nine Palms Band of Mission Indians	
	Yavapai-Apache Nation	
	Yavapai-Prescott Indian Tribe	

4.6.3 Methods for Analysis

4.6.3.1 Analysis Area

The analysis area for the Project consists of areas where direct effects to cultural resources may occur. Direct effects are defined by areas where ground disturbance would occur for Project construction, such as structure locations, access roads, lay down areas, and spur roads, among others. The analysis area is defined as a 200-foot-wide corridor where direct effects are projected to occur. Baseline data for the analysis area is presented in Section 3.6 and is considered to provide an appropriate measure of potential direct effects of the Project.

In addition to direct impacts, indirect impacts to cultural resources as a result of the Project may occur. Indirect impacts to cultural resources include visual, atmospheric, and auditory effects (. As tabulated and presented in Section 3.6, indirect atmospheric and auditory effects may occur in an area measuring 0.5-mile from each alternative or subalternative. From a visual standpoint, potential indirect effects to cultural resources were delineated to include 5 miles on either side of the alternatives and subalternatives. In certain situations, the 5-mile visual analysis area was adjusted based on the presence of topography that restricts the viewshed. For Section 106 purposes, the APE for indirect effects is defined differently (Appendix 2D).

4.6.3.2 Assumptions

The cultural resources data for this analysis are based on the results of Class I baseline data and ethnographic information; additional Class III survey data was gathered for Segments p-17 and p-18, and a portion of Segment p-16 in California (Gardner et al. 2018). Based on the scope of the Project, the BLM has determined that the development of a Project-specific PA in consultation with interested Indian tribes, land-managing and permitting agencies, and other consulting parties is required (Appendix 2D). The Section 106 process is on-going; additional impacts may be identified through PA consultation efforts.

The PA would refine the direct and indirect APE based on design plans for the selected alternative. The Project's direct effects APE, defined as a corridor along the selected alternative where the construction of Project elements such as structures, access and spur roads, and other ancillary elements would occur, would be intensively investigated at the Class III survey level (Section 3.6.1.6).

All cultural resources identified during the Class III survey would be evaluated per NRHP criteria defined in 36 CFR 60 (Section 3.6.1.1). Under Section 106 of the NHPA, as implemented under 36 CFR 800, all cultural resources must be evaluated for their eligibility to be listed in the NRHP, and the direct and indirect effects of the Project on historic properties must be assessed and considered. Direct effects of the Project on historic properties would be assessed based on design plans.

Historic properties are identified within the indirect auditory and atmospheric effects analysis area for which integrity of setting, feeling, and association are contributors to the property's NRHP eligibility. Effects on historic properties sensitive to auditory or atmospheric effects are measured by the potential of construction to affect the integrity of the property's setting, feeling, and association, if that integrity has been retained.

Further, the analysis identifies historic properties within the indirect visual effects analysis area whose character-defining properties could be adversely impacted. The expanded corridor for assessing indirect visual effects, as defined above, is necessary in order to allow for relatively subtle, but potentially important, visual effects, as well as for errors or ambiguities in the recorded locations and boundaries of some resources.

Potential adverse effects to historic properties would be resolved in accordance with the provisions of the PA and specific HPTPs. Avoidance of cultural resources by final design and construction would be the preferred adverse effect resolution measure.

Several approaches to the analysis of direct and indirect impacts to cultural resources are presented in this section. These consist of:

- Amount of permanent and temporary disturbance within the 200-foot-wide analysis area corridor (direct effect);
- Number of structures within the 200-foot-wide analysis area corridor (indirect visual effect);
- Number of known historic properties within the 200-foot-wide analysis area (direct effect);
- Number of historic properties projected to occur within the 200-foot-wide analysis area corridor (direct effect);
- In the subalternative analysis, the acreage of previous Class III inventory survey is presented to provide comparable discussion of site density and survey coverage; and
- Number and type of known locations of concern to Indian tribes within indirect effect analysis areas.

4.6.3.3 Environmental Effect Indicators, Magnitude, and Duration

The following impact indicators (and impact magnitude duration and definitions in Table 4.6-4) are considered to constitute major impacts to cultural resources if they result from the construction, operation, maintenance, or decommissioning of the Project:

- Damage to or loss of a historic property that is listed, or eligible for listing, on the NRHP, Arizona Register of Historic Places (ARHP), or California Register of Historic Resources (CRHR);
- An activity would directly or indirectly alter the characteristics of the historic property that qualify it for inclusion in the NRHP, ARHP, or CRHR (location, design, setting, materials, workmanship, feeling, or association);
- Loss or degradation would also include cases in which access to the historic property is restricted for future use (i.e. a sacred site);
- Exposure of historic properties to vandalism or unauthorized collecting;
- A substantial increase in the potential for erosion or other natural processes that could affect historic properties;
- Neglect of a historic property that causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe;
- Transfer, lease, or sale of a historic property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the resource’s historic significance; and,
- Disturbance of any human remains, including those interred outside of formal cemeteries.

Impact magnitude and duration definitions specific to cultural resources are defined in Table 4.6-4.

Table 4.6-4 Cultural Resources Impact Magnitude and Duration Definitions

ATTRIBUTE OF IMPACT		DESCRIPTION SPECIFIC TO CULTURAL RESOURCES
Magnitude	No impact	None
	Negligible	No measurable change to the current condition of cultural resources would result from Project construction, operation, maintenance, or decommissioning. There would be no effect to the existing NRHP/ARHP/CRHR qualities of individual historic properties.
	Minor	There would be a small, but measurable change to the current condition of historic properties as a result of Project construction, operation, maintenance, or decommissioning. While a change to a historic property would occur, it would not affect any of the NRHP/ARHP/CRHR qualities of individual historic properties, and the eligibility of the property to the NRHP/ARHP/CRHR would not be altered.
	Moderate	An easily discernable and measurable change to the existing NRHP/ARHP/CRHR qualities of historic properties would occur as a result of Project construction, operation, maintenance, or decommissioning. While the existing qualities of an NRHP/ARHP/CRHR property may be diminished, it would not be to a degree that the properties' NRHP/ARHP/CRHR eligibility would be altered.
	Major	A large, easily measurable change in the current conditions would result in significant impacts to historic properties as a result of Project construction, operation, maintenance, and decommissioning, and would substantially alter the NRHP/ARHP/CRHR qualities and eligibility status of individual historic properties.
Duration	Temporary	Limited to active construction or maintenance.
	Short-term	During construction (1.5 to 2 years), up to 10 years.
	Long-term	More than 10 years.

4.6.4 No Action Alternative

Under the No Action Alternative, no ROW would be granted for the Project and the transmission line, SCS, and ancillary facilities would not be constructed.

Historic properties would not be affected by the Project from any forms of ground disturbance. Because no access improvements would be made, the risk of damage to historic properties associated with vehicular access to areas currently without roads would not change. Project-related support structures and other facilities would not be constructed, so resources sensitive to visual change would not be affected. Current conditions in the Analysis Area would continue under the No Action Alternative and there would be no changes that would alter historic properties beyond current conditions. The Project Area would remain undisturbed unless unrelated actions occur.

4.6.5 Construction of Action Alternative Segments

4.6.5.1 Direct and Indirect Effects Common to All Action Alternatives

Ground disturbance during construction is expected with all Action Alternatives and may result in the damage or loss of historic properties; however, the number and types of resources affected would vary depending on the individual alternative. Historic properties would be avoided by the Project as the primary means of precluding impacts. The primary contributor of permanent ground disturbance would be related to structure and SCS construction, as well as the construction of/improvements to access and spur roads. Temporary disturbance may also have direct effects to historic properties and would be related to temporary use areas utilized during Project construction, such as staging areas that would be reclaimed following construction.

Specific impacts to historic properties are unknown until Class III identification studies and indirect effect analyses of the selected route are completed, and additional information regarding engineering design is available. As a result, evidence is currently insufficient to state specific direct or indirect impacts to particular historic properties or to discuss specific measures to resolve potential effects to those properties.

General measures to resolve potential adverse direct and indirect effects to historic properties as a result of Project construction would be contained in the PA, and specific measures would be outlined in HPTPs. The HPTPs would be developed following Class III survey identification efforts following the signing of the ROD. Avoidance of historic properties by final design and construction would be the preferred measure for the resolution of potential direct impacts.

With the exceptions of Segments p-17, p-18, qs-01, x-10, and ca-09, which are discussed in Section 4.6.4.5, direct impacts due to construction could range between negligible (if eligible sites could be avoided by Project design) and major (if eligible sites could not be avoided by Project design). With the exception of the five noted segments, the range of direct impacts due to construction and the resolution of potential adverse effects are common to all segments; therefore, the impacts and resolution are not repeated for the segment-specific effects.

Indirect effects to historic properties could occur in areas where the construction of new roads into the Project Area would provide improved access into previously inaccessible areas. Improved access could lead to site damage by off-road vehicles and recreational use of these areas. Such damage could consist of vehicular damage to surface archaeological sites, and vandalism to sensitive areas where rock art is present. Measures to resolve potential adverse effects to historic properties as a result of improved access would be included in the PA and the ROD.

Indirect visual impacts could occur from the presence of structures in sight of NRHP-listed historic properties or properties eligible for inclusion in the NRHP under Criterion A, B, or C by altering the setting of the properties. The historic properties affected would vary by alternative. Resolution measures to minimize the potential adverse effects of visual intrusions would be contained in the PA and HPTPs and implemented by Project design. For example, during Project design, support structures may be positioned so that they are not visible from the historic properties sensitive to visual intrusion.

Site types that are known to occur in the Project Area and known to be potentially sensitive to visual impacts include prehistoric trails, petroglyph sites, and intaglios. In the discussion of specific segments that follows, the presence of these sites (if known) in the 200-foot analysis corridor or 1-mile buffer is disclosed. If sites of this type exhibit a high degree of integrity of setting, feeling, and association, and also qualify as NRHP-eligible historic properties, an assessment of indirect visual effects of the Project features (such as transmission line structures and access roads) on their NRHP qualities would be required and specified in HPTPs.

Additionally, other historic properties sensitive to indirect effects may be identified by future Class III survey field work of the direct effects analysis area and/or future studies of indirect effects to historic properties in the indirect effects APE. When identified, these properties would be subject to additional analysis to be specified in HPTPs.

The range of indirect impacts outlined previously and the resolution of potential adverse indirect effects is common to all segments; therefore, these are not repeated for the segment-specific effects.

The following section presents known cultural resources data from a 200-foot analysis corridor defined as the "direct APE" for the purposes of this document. The extent of previous cultural resources survey, counts of known historic properties, counts of cultural resources for which NRHP eligibility is unknown, and projections of total numbers of historic properties and sites of undetermined eligibility is presented by zone, and further subdivided by segments within specific alternatives and subalternatives.

For the purposes of this discussion, total site density (regardless of NRHP eligibility status) for each individual segment within specific alternatives and subalternatives per 100 acres is presented. The formula for this calculation is as follows:

$$Site\ density\ per\ 100\ acres = \frac{\text{\# of known sites}}{\text{acres surveyed}} \times 100$$

For example, 16.6 acres of the 200-foot corridor of Segment cb-03 has been previously surveyed. A total of two sites (regardless of NRHP eligibility status) were recorded within those 16.6 acres. The calculated site density per 100 acres for the 200-foot corridor of Segment cb-03 is as follows:

$$12 = \frac{2}{16.6} \times 100$$

Additionally, projected numbers of sites per NRHP eligibility status category are calculated for each individual segment within specific alternatives and subalternatives. The formula for this calculation is as follows:

$$Projected\ \#\ of\ sites = \frac{\text{segment acres}}{100} \times \text{site (per NRHP eligibilty status) density per 100 acres}$$

For example, two sites were recorded within the 106.0 acres of the 200-foot corridor of Segment cb-03, however, only one is NRHP-eligible. To project the site density of NRHP eligible sites within Segment cb-03, the number 6 (representing the value of a single site, in this example) is used in the calculation below. The calculated projected number of NRHP-eligible sites for the 200-foot corridor of Segment cb-03 is as follows:

$$6 = \frac{106.0}{100} \times 6.0$$

These same calculations are used to assess site density and projected site counts for the proposed action, alternative, and subalternative routes. These calculations use combined acres and combined surveyed acres from which to calculate percentage surveyed, site density, and projected sites.

The example below shows that the segments of Subalternative 1A, combined, includes 241.5 acres. 7.5 percent of those 241.5 acres have been surveyed. The density of known sites per 100 acres of the entire 241.5-acre subalternative is 16.6 (because there is more acreage, but still only the known sites from segment p-02). The known sites are the combined known sites from each segment, and the resulting density and projected site count are based on the total site count and the combined acres or acres surveyed, using the formula above.

Another example below shows that the segments of Subalternative 4P, combined, includes 250.2 acres. 60.4 percent of those 250.2 acres have been surveyed. The density of known sites per 100 acres of the entire 250.2-acre subalternative is 31.1.

These two examples reveal how differently site count can be projected if the resulting projections from each segment are added together, rather than calculated based upon the combined acres and acres surveyed. Using the same calculation for individual segments as for complete routes allows for an apple-to-apple comparison or perspective.

For analysis purposes, minimum survey coverage of 25 percent or more is considered to be adequate to estimate the projected number of cultural resources by eligibility category for each Project segment. In cases where survey coverage of at least 25 percent can be demonstrated with negative findings, the projected sensitivity for cultural resources is considered to be low. However, this does not take into account potential environmental variations that may affect the distribution of cultural resources on the landscape per segment.

Example Table for Site Density Calculations:

SEGMENT NO.	ACRES (200-FT CORRIDOR)	PERCENTAGE OF SEGMENT SURVEYED (%)	DENSITY OF KNOWN SITES (PER 100 ACRES)[1]	COUNT OF KNOWN DETERMINED OR RECOMMENDED ELIGIBLE SITES	COUNT OF KNOWN UNEVALUATED / UNKNOWN ELIGIBILITY SITES	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF NRHP-ELIGIBLE SITES[2]	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF SITES TO BE EVALUATED[2]
ALTERNATIVE 1, SUBALTERNATIVE 1A							
p-02	26.1	13.5	85.7	1	1	28.6/7	28.6/7
p-03	50.8	14.7	0.0	0	0	0.0/0	0.0/0
x-02a	80.4	0.0	0.0	0	0	0.0/0	0.0/0
x-02b	84.2	4.4	0.0	0	0	0.0/0	0.0/0
Total	241.5	7.5	16.6	1	1	5.5/13	5.5/13
ALTERNATIVE 4, SUBALTERNATIVE 4P							
p-16	116.1	14.6	47.3	0	5	0.0/0	29.6/34
p-17	71.2	100	35.1	2	7	2.8/2	9.8/7
p-18	62.9	100	22.3	1	7	1.6/1	11.1/7
Total	250.2	60.4	31.1	3	19	2.0/5	12.6/31

4.6.5.2 East Plains and Kofa Zone

Direct and Indirect Segment-specific Effects

Within the East Plains and Kofa Zone, individual segments are discussed in terms of segment-specific disturbance, potential visual intrusions associated with structures, and known and projected cultural resources. Refer to Table 4.6-5 for data associated with the following segment discussions.

Segment p-01
Two historic and prehistoric sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 3.3. eligible sites per 100 acres. Seven cultural resources that have been previously unevaluated for NRHP eligibility are present.

Based on the extent of previous Class III survey coverage (46.7 percent), a total of four sites eligible for inclusion in the NRHP and a total of 15 sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor. No known historic properties sensitive to visual considerations occur along Segment p-01. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment p-02
One site previously determined eligible for inclusion in the NRHP has been previously recorded within the 200-foot analysis corridor for a total site density of 28.6 eligible sites per 100 acres. One site previously unevaluated for the NRHP has been previously recorded within the 200-foot analysis corridor for a total site density of 28.6 unevaluated sites per 100 acres.

Based on the extent of previous Class III survey coverage (13.5 percent), a total of seven sites eligible for inclusion in the NRHP and a total of seven sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor. However, due to the low percentage sample of existing survey coverage, the projected number of sites may be misrepresented.

No known historic properties sensitive to visual considerations occur along Segment p-02. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Table 4.6-5 Known Survey and Anticipated Cultural Resources in Segments by Alternative and Subalternative in the East Plains and Kofa Zone

SEGMENT NO.	ACRES (200-FT CORRIDOR)	PERCENTAGE OF SEGMENT SURVEYED (%)	DENSITY OF KNOWN SITES (PER 100 ACRES)[1]	COUNT OF KNOWN DETERMINED OR RECOMMENDED ELIGIBLE SITES	COUNT OF KNOWN UNEVALUATED/ UNKNOWN ELIGIBILITY SITES	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF NRHP-ELIGIBLE SITES[2]	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF SITES TO BE EVALUATED[2]
PROPOSED ACTION							
p-01	643.2	46.7	3.3	2	7	0.7/4	2.3/15
p-02	26.1	13.5	85.7	1	1	28.6/7	28.6/7
p-03	50.8	14.7	0.0	0	0	0.0/0	0.0/0
p-04	115.7	26.0	23.3	2	1	6.7/8	3.3/4
p-05	68.0	17.9	24.8	2	0	16.5/11	0.0/0
p-06	865.9	23.8	8.3	15	2	7.3/63	1.0/8
ALTERNATIVE 1							
p-01	643.2	46.7	3.3	2	7	0.7/4	2.3/15
i-01	205.0	21.2	9.4	0	2	0.0/0	9.4/19
i-02	77.5	0.0	0.0	0	0	0.0/0	0.0/0
i-03	488.1	4.2	19.4	1	3	4.9/24	14.6/71
i-04	256.1	2.0	20.0	0	0	0.0/0	0.0/0
ALTERNATIVE 1, SUBALTERNATIVE 1A							
p-02	26.1	13.5	85.7	1	1	28.6/7	28.6/7
p-03	50.8	14.7	0.0	0	0	0.0/0	0.0/0
x-02a	80.4	0.0	0.0	0	0	0.0/0	0.0/0
x-02b	84.2	4.4	0.0	0	0	0.0/0	0.0/0

SEGMENT NO.	ACRES (200-FT CORRIDOR)	PERCENTAGE OF SEGMENT SURVEYED (%)	DENSITY OF KNOWN SITES (PER 100 ACRES)[1]	COUNT OF KNOWN DETERMINED OR RECOMMENDED ELIGIBLE SITES	COUNT OF KNOWN UNEVALUATED/ UNKNOWN ELIGIBILITY SITES	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF NRHP-ELIGIBLE SITES[2]	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF SITES TO BE EVALUATED[2]
ALTERNATIVE 1, SUBALTERNATIVE 1B							
p-02	26.1	13.5	85.7	1	1	28.6/7	28.6/7
x-01	195.1	2.0	100.0	0	0	0.0/0	0.0/0
x-02a	80.4	0.0	0.0	0	0	0.0/0	0.0/0
ALTERNATIVE 1, SUBALTERNATIVE 1C							
in-01	337.5	2.0	30.3	2	0	30.3/102	0.0/0
ALTERNATIVE 2							
i-01	205.0	21.2	9.4	0	2	0.0/0	9.4/19
i-02	77.5	0.0	0.0	0	0	0.0/0	0/0
i-03	488.1	4.2	19.4	1	3	4.9/24	14.6/71
i-04	256.1	2.0	20.0	0	0	0.0/0	0.0/0
p-01	643.2	46.7	3.3	2	7	0.7/4	2.3/15
ALTERNATIVE 2, SUBALTERNATIVE 2A							
d-01	612.8	5.7	5.7	0	2	0.0/0	5.7/35
x-02a	80.4	0.0	0.0	0	0	0.0/0	0.0/0
x-02b	84.3	4.4	0.0	0	0	0.0/0	0.0/0

SEGMENT NO.	ACRES (200-FT CORRIDOR)	PERCENTAGE OF SEGMENT SURVEYED (%)	DENSITY OF KNOWN SITES (PER 100 ACRES)[1]	COUNT OF KNOWN DETERMINED OR RECOMMENDED ELIGIBLE SITES	COUNT OF KNOWN UNEVALUATED/ UNKNOWN ELIGIBILITY SITES	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF NRHP-ELIGIBLE SITES[2]	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF SITES TO BE EVALUATED[2]
ALTERNATIVE 2, SUBALTERNATIVE 2B							
p-02	26.1	13.5	85.7	1	1	28.6/7	28.6/7
p-03	50.8	14.7	0.0	0	0	0.0/0	0.0/0
p-04	115.7	26.0	23.3	2	1	6.7/8	3.3/4
x-03	137.3	1.7	0.0	0	0	0.0/0	0.0/0
ALTERNATIVE 3							
i-03	488.1	4.2	19.4	0	3	0.0/0	14.6/71
i-04	256.1	2.0	20.0	0	0	0.0/0	0.0/0
p-01	643.2	46.7	3.3	2	7	0.7/5	2.3/15
p-02	26.1	13.5	85.7	1	1	28.6/7	28.6/7
p-03	50.8	14.7	0.0	0	0	0.0/0	0.0/0
p-04	115.7	26.0	23.3	2	1	6.7/8	3.3/4
x-03	137.3	1.7	0.0	0	0	0.0/0	0.0/0
ALTERNATIVE 3, SUBALTERNATIVE 3A							
d-01	612.8	5.7	5.7	0	2	0.0/0	5.7/35
x-02a	80.4	0.0	0.0	0	0	0.0/0	0.0/0
x-02b	84.3	4.4	0.0	0	0	0.0/0	0.0/0
i-02	77.5	0.0	0.0	0	0	0.0/0	0.0/0

SEGMENT NO.	ACRES (200-FT CORRIDOR)	PERCENTAGE OF SEGMENT SURVEYED (%)	DENSITY OF KNOWN SITES (PER 100 ACRES)[1]	COUNT OF KNOWN DETERMINED OR RECOMMENDED ELIGIBLE SITES	COUNT OF KNOWN UNEVALUATED/ UNKNOWN ELIGIBILITY SITES	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF NRHP-ELIGIBLE SITES[2]	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF SITES TO BE EVALUATED[2]
ALTERNATIVE 3, SUBALTERNATIVE 3B							
i-01	205.0	21.2	9.4	0	2	0.0/0	9.4/19
i-02	77.5	0.0	0.0	0	0	0.0/0	0.0/0
ALTERNATIVE 3, SUBALTERNATIVE 3C							
p-05	68.0	17.9	24.8	1	0	8.3/6	0.0/0
x-04	549.7	4.4	14.1	0	1	0.0/0	4.1/23
ALTERNATIVE 3, SUBALTERNATIVE 3D							
in-01	337.5	2.0	30.3	2	0	30.3/102	0.0/0
ALTERNATIVE 4							
d-01	612.8	5.7	5.7	0	2	0.0/0	5.7/35
in-01	337.5	2.0	30.3	2	0	30.3/102	0.0/0
p-04	115.7	26.0	23.3	2	1	6.7/8	3.3/4
p-05	68.0	17.9	24.8	1	0	8.3/6	0.0/0
x-04	549.7	4.4	14.1	0	1	0.0/0	4.1/23
ALTERNATIVE 4, SUBALTERNATIVE 4A							
p-01	643.2	46.7	3.3	2	7	0.7/4	2.3/15
p-02	26.1	13.5	85.7	1	1	28.6/7	28.6/7
p-03	50.8	14.7	0.0	0	0	0.0/0	0.0/0
ALTERNATIVE 4, SUBALTERNATIVE 4B							
x-03	137.3	1.7	0.0	0	0	0.0/0	0.0/0
i-03	488.1	4.2	19.4	1	3	4.9/24	14.56/71

SEGMENT NO.	ACRES (200-FT CORRIDOR)	PERCENTAGE OF SEGMENT SURVEYED (%)	DENSITY OF KNOWN SITES (PER 100 ACRES)[1]	COUNT OF KNOWN DETERMINED OR RECOMMENDED ELIGIBLE SITES	COUNT OF KNOWN UNEVALUATED/ UNKNOWN ELIGIBILITY SITES	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF NRHP-ELIGIBLE SITES[2]	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF SITES TO BE EVALUATED[2]
ALTERNATIVE 4, SUBALTERNATIVE 4C							
i-04	256.1	2.0	20.0	0	0	0.0/0	0.0/0
ALT SCS 12kV DISTRIBUTION LINE							
12kV Line	7.6	5.3	0.0	0	0	0	0.0/0

Note: see Section 4.6.5.1 for a discussion of how the density of projected sites was calculated.

[1]Density of known sites/100 acres includes sites that are previously recommended/determined ineligible for listing in the NRHP.

[2](/) is used in this column to indicate the separation of data values

Segment p-03
A total of 14.7 percent of Segment p-03 has been investigated by Class III survey. No sites previously recommended/determined eligible or unevaluated for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. As a result, no meaningful evaluation of potential site density or direct effect can be made.

No known historic properties sensitive to visual considerations occur along Segment p-03. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment p-04
Two sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 6.7 eligible sites per 100 acres. One site previously unevaluated for the NRHP has been previously recorded within the 200-foot analysis corridor for a total site density of 3.3 unevaluated sites per 100 acres. Previously recorded sites within 0.5-mile of Segment p-04 include trails, indicating that this site type may occur in the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (26.0 percent), a total of eight sites eligible for inclusion in the NRHP and a total of four sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor.

Segment p-05
One site previously recommended eligible for inclusion in the NRHP has been previously recorded within the 200-foot analysis corridor for a total site density of 8.3 eligible sites per 100 acres. No sites previously unevaluated for the NRHP have been recorded within the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (17.9 percent), a total of six sites eligible for inclusion in the NRHP are projected to occur in the 200-foot analysis corridor. However, due to the low percentage sample of existing survey coverage, the projected number of sites may be misrepresented.

No known historic properties sensitive to visual considerations occur along Segment p-05. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment p-06
Four sites previously determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 1.9 eligible sites per 100 acres. A total of two sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 1.0 unevaluated sites per 100 acres. Previously recorded sites within 0.5-mile of Segment p-06 include trails and petroglyphs, indicating that these site types may occur in the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (23.8 percent), a total of 17 sites eligible for inclusion in the NRHP and a total of eight sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor.

Two sites potentially sensitive to indirect visual impacts are located within 1 mile of Segment p-06. The Indian Well Site, AZ-050-1445, is situated along the northern side of Cave Creek in the Kofa Mountains and consists of two groups of petroglyphs near a spring or seep. The other is an area of undocumented rock rings. Both are located to the north of the segment.

Segment d-01
No sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. A total of two sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 5.7 unevaluated sites per 100 acres. Previously recorded sites within 0.5-mile of Segment d-01 include trails, indicating that this site type may occur in the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (5.7 percent), a total of 35 sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor. However, due to the low percentage sample of existing survey coverage, the projected number of sites may be misrepresented.

One NRHP-listed site potentially sensitive to indirect visual impacts, the Eagletail Petroglyph Site, is located within the 5-mile indirect effects analysis area of Segment d-01 in the Eagletail Mountains.

Segment i-01
No sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. Two sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 9.4 unevaluated sites per 100 acres.

Based on the extent of previous Class III survey coverage (21.2 percent), a total of 19 sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor. However, due to the low percentage sample of existing survey coverage, the projected number of sites may be misrepresented.

No known historic properties sensitive to visual considerations occur along Segment i-01. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment i-02
No previous Class III cultural resources survey has been conducted in the 200-foot analysis corridor. No sites have been recorded in the corridor. As a result, no meaningful evaluation of potential site density or direct effect can be made.

No known historic properties sensitive to visual considerations occur along Segment i-02. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment i-03
One site previously recommended eligible for inclusion in the NRHP has been previously recorded within the 200-foot analysis corridor for a site density of 4.9 NRHP-eligible sites per 100 acres. A total of three sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 14.6 unevaluated sites per 100 acres. Previously recorded sites within 0.5-mile of Segment i-03 include trails, indicating that this site type may occur in the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (4.2 percent), a total of 24 sites eligible for inclusion in the NRHP and a total of 71 sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor. However, due to the low percentage sample of existing survey coverage, the projected number of sites may be misrepresented.

Segment i-04
Only 2.0 percent of the 200-foot analysis corridor of Segment i-04 has been intensively surveyed for cultural resources. No sites were identified. Given the small sample size and negative results of the survey, no meaningful evaluation of potential site density or direct effect can be made.

No known historic properties sensitive to visual considerations occur along Segment i-04. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment in-01
Two sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 30.3 eligible sites per 100 acres. No sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (2.0 percent), a total of 102 sites eligible for inclusion in the NRHP are projected to occur in the 200-foot analysis corridor. However, due to the low percentage sample of existing survey coverage, the projected number of sites may be misrepresented.

No known historic properties sensitive to visual considerations occur along Segment in-01 Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment x-01
No sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. No sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (2.0 percent), no sites eligible for inclusion in the NRHP are projected to occur in the 200-foot analysis corridor. However, due to the low percentage sample of existing survey coverage, the projected number of sites may be misrepresented.

No known historic properties sensitive to visual considerations occur along Segment x-01. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment x-02a
There is no Class III survey data in the 200-foot analysis corridor of Segment x-02a and no sites have been identified. Because of the lack of survey data, the number of potential sites cannot be estimated, but sites may occur within the analysis corridor. Previously recorded sites within 0.5-mile of Segment x-02a include trails, indicating that this site type may occur in the 200-foot analysis corridor.

Segment x-02b
Only 4.4 percent of the 200-foot analysis corridor of Segment x-02b has been intensively surveyed for cultural resources. No cultural resources sites were identified. Given the small sample size and negative results of the survey, no meaningful evaluation of potential site density or direct effect can be made. However, previously recorded sites within 0.5-mile of Segment x-02b include trails, indicating that this site type may occur in the 200-foot analysis corridor.

Segment x-03
Only 1.7 percent of the 200-foot analysis corridor of Segment x-03 has been intensively surveyed for cultural resources. No sites were identified. Given the small sample size and negative results of the survey, no meaningful evaluation of potential site density or direct effect can be made. However, previously recorded sites within 0.5-mile of Segment x-03 include trails, indicating that this site type may occur in the 200-foot analysis corridor.

Segment x-04
No sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. One site previously unevaluated for the NRHP has been previously recorded within the 200-foot analysis corridor for a total site density of 4.1 unevaluated sites per 100 acres. Previously recorded sites within 0.5-mile of Segment p-04 include trails, indicating that this site type may occur in the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (4.4 percent), a total of 23 sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor. However, due to the low percentage sample of existing survey coverage, the projected number of sites may be misrepresented.

Alternative SCS 12kV Distribution Line

No sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 20-foot analysis corridor. No sites previously unevaluated for the NRHP have been previously recorded within the 20-foot analysis corridor.

Based on the extent of previous Class III survey coverage (5.3 percent), no sites eligible for inclusion in the NRHP are projected to occur in the 20-foot analysis corridor. However, due to the low percentage sample of existing survey coverage, the projected number of sites may be misrepresented.

4.6.5.3 Quartzsite Zone

Direct and Indirect Segment-specific Effects

Refer to Table 4.6-6 for data associated with the following segment discussions.

Segment p-07
One site previously determined eligible for inclusion in the NRHP has been previously recorded within the 200-foot analysis corridor for a total site density of 6.8 eligible sites per 100 acres. Four cultural resource sites previously unevaluated for the NRHP has been previously recorded within the 200-foot analysis corridor for a total site density of 27.4 unevaluated sites per 100 acres. Previously recorded sites within 0.5-mile of Segment p-07 include trails, indicating that this site type may occur in the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (14.6 percent), a total of 4 sites eligible for inclusion in the NRHP and a total of 14 sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor. However, due to the low percentage sample of existing survey coverage, the projected number of sites may be misrepresented.

Segment p-08
No sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. No sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (5.6 percent), no sites eligible for inclusion in the NRHP are projected to occur in the 200-foot analysis corridor. However, due to the low percentage sample of existing survey coverage, the projected number of sites may be misrepresented.

No known historic properties sensitive to visual considerations occur along Segment p-08. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment i-05
No sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. One site previously unevaluated for the NRHP has been previously recorded within the 200-foot analysis corridor for a total site density of 4.0 unevaluated sites per 100 acres.

Based on the extent of previous Class III survey coverage (36.3 percent), a total of three sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor.

Table 4.6-6 Known Survey and Anticipated Cultural Resources in Segments by Alternative and Subalternative in the Quartzsite Zone

SEGMENT NO.	ACRES (200-FT CORRIDOR)	PERCENTAGE OF SEGMENT SURVEYED (%)	DENSITY OF KNOWN SITES (PER 100 ACRES)[1]	COUNT OF KNOWN DETERMINED OR RECOMMENDED ELIGIBLE SITES	COUNT OF KNOWN UNEVALUATED/ UNKNOWN ELIGIBILITY SITES	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF NRHP-ELIGIBLE SITES[2]	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF SITES TO BE EVALUATED[2]
PROPOSED ACTION							
p-07	51.6	14.6	34.2	1	4	6.8/4	27.4/14
p-08	16.6	5.6	17.9	0	0	0.0/0	0.0/0
ALTERNATIVE 1							
i-05	69.6	36.3	4.0	0	1	0.0/0	4.0/3
qs-01	75.1	94.1	0.0	0	0	0.0/0	0.0/0
qs-02	118.0	38.4	11.0	1	0	2.2/3	0.0/0
ALTERNATIVE 1, SUBALTERNATIVE 1D							
qn-01	15.1	89.6	22.2	1	1	7.4/1	7.4/1
ALTERNATIVE 2							
i-05	69.6	36.3	4.0	0	1	0.0/0	4.0/3
qs-01	75.1	94.1	0.0	0	0	0.0/0	0.0/0
x-07	188.2	3.1	0.8	0	6	0.0/0	105.3/198
ALTERNATIVE 3							
p-07	51.6	14.6	34.2	1	4	6.8/4	27.4/14
p-08	16.6	5.6	17.9	0	0	0.0/0	0.0/0
x-05	248.9	1.0	41.7	1	0	41.7/104	0.0/0
ALTERNATIVE 3, SUBALTERNATIVE 3E							
qs-01	75.1	94.1	0.0	0	0	0.0/0	0.0/0

SEGMENT NO.	ACRES (200-FT CORRIDOR)	PERCENTAGE OF SEGMENT SURVEYED (%)	DENSITY OF KNOWN SITES (PER 100 ACRES)[1]	COUNT OF KNOWN DETERMINED OR RECOMMENDED ELIGIBLE SITES	COUNT OF KNOWN UNEVALUATED/ UNKNOWN ELIGIBILITY SITES	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF NRHP-ELIGIBLE SITES[2]	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF SITES TO BE EVALUATED[2]
x-07	188.2	3.1	122.8	0	6	0.0/0	105.3/198
ALTERNATIVE 3, SUBALTERNATIVE 3F							
x-06	225.1	23.7	11.2	3	2	5.6/13	3.7/8
ALTERNATIVE 3, SUBALTERNATIVE 3G							
qn-01	15.1	89.6	22.2	1	1	7.4/1	7.4/1
ALTERNATIVE 3, SUBALTERNATIVE 3H							
qn-02	263.3	56.6	4.7	3	1	2.0/5	0.7/2
ALTERNATIVE 3, SUBALTERNATIVE 3J							
i-05	69.6	36.3	4	0	1	0.0/0	4.0/3
ALTERNATIVE 4							
p-08	16.6	5.6	17.9	0	0	0.0/0	0.0/0
qn-01	15.1	89.6	22.2	1	1	7.4/1	7.4/1
x-06	225.1	23.7	11.2	3	2	5.6/13	3.7/8
ALTERNATIVE 4, SUBALTERNATIVE 4D							
x-05	248.9	1.0	41.7	1	0	41.7/104	0.0/0
p-07	51.6	14.6	34.2	1	4	6.8/4	27.4/14
ALTERNATIVE 4, SUBALTERNATIVE 4J							
i-05	69.6	36.3	4	0	1	0.0/0	4.0/3

Note: see Section 4.6.5.1 for a discussion of how the density of projected sites was calculated.

[1]Density of known sites/100 acres includes sites that are previously recommended/determined ineligible for listing in the NRHP.

[2](/) is used in this column to indicate a separation of data values.

No known historic properties sensitive to visual considerations occur along Segment i-05. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment qn-01
One site previously recommended eligible for inclusion in the NRHP has been previously recorded within the 200-foot analysis corridor for a total site density of 22.2 eligible sites per 100 acres. One site previously unevaluated for the NRHP has been previously recorded within the 200-foot analysis corridor for a total site density of 7.4 unevaluated sites per 100 acres.

Based on the extent of previous Class III survey coverage (89.6 percent), one site eligible for inclusion in the NRHP and one site requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor.

No known historic properties sensitive to visual considerations occur along Segment qn-01. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment qn-02
Three cultural resources sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 4.7 eligible sites per 100 acres. One site previously unevaluated for the NRHP has been previously recorded within the 200-foot analysis corridor for a total site density of 0.7 unevaluated sites per 100 acres. Previously recorded sites within 0.5-mile of Segment qn-02 include trails and intaglios, indicating that these site types may occur in the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (56.6 percent), a total of five sites eligible for inclusion in the NRHP and a total of two sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor.

Segment qs-01
No sites previously recommended, determined eligible, or unevaluated for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. Previously recorded sites within 0.5-mile of Segment p-07 include trails, indicating that this site type may occur in the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (94.1 percent) with negative results, Segment qs-01 demonstrates a low sensitivity for cultural resources; however, prehistoric trails are considered to be important to Indian tribes and may be sensitive to indirect visual impact if they qualify as NRHP historic properties and exhibit integrity of setting, feeling, and association. As a result, direct impacts due to construction could range between no impact (if no potentially eligible sites are within the direct APE) and major (if potential eligible sites are present and could not be avoided by Project design).

Segment qs-02
One site previously recommended or determined eligible for inclusion in the NRHP has been previously recorded within the 200-foot analysis corridor for a total site density of 2.2 eligible sites per 100 acres. No cultural resource sites previously unevaluated for the NRHP has been previously recorded within the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (38.4 percent), a total of three sites eligible for inclusion in the NRHP are projected to occur in the 200-foot analysis corridor.

No known historic properties sensitive to visual considerations occur along Segment qs-02. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment x-05
One site previously recommended or determined eligible for inclusion in the NRHP has been previously recorded within the 200-foot analysis corridor for a total site density of 41.7 eligible sites per 100 acres. No sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor. Previously recorded sites within 0.5-mile of Segment x-05 include trails, indicating that this site type may occur in the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (14.6 percent), a total of 104 sites eligible for inclusion in the NRHP and a total of 93 sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor. However, due to the low percentage sample of existing survey coverage, the projected number of sites may be misrepresented.

Segment x-06
Three sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 5.6 eligible sites per 100 acres. Two sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 3.7 unevaluated sites per 100 acres. Previously recorded sites within 0.5-mile of Segment x-06 include trails, indicating that this site type may occur in the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (23.7 percent), a total of 13 sites eligible for inclusion in the NRHP and a total of eight sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor.

Segment x-07
No sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. Six sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 105.3 unevaluated sites per 100 acres. Previously recorded sites within 0.5-mile of Segment x-07 include trails, indicating that this site type may occur in the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (3.1 percent), no sites eligible for inclusion in the NRHP and a total of 198 sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor. However, due to the low percentage sample of existing survey coverage, the projected number of sites may be misrepresented.

4.6.5.4 Copper Bottom Zone

Direct and Indirect Segment-specific Effects

Refer to Table 4.6-7 for data associated with the following segment discussions.

Segment p-09
No sites previously recommended eligible or determined eligible for the NRHP have been previously recorded in the 200-foot analysis corridor. Two sites previously unevaluated for NRHP significance have been recorded for a total density of unevaluated sites of 1.5 sites per 100 acres within the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (77.4 percent), no sites eligible for inclusion in the NRHP are projected to occur in the 200-foot analysis corridor. Three previously unevaluated for NRHP significance are projected to occur. Segment p-09 is thus considered to have a low sensitivity for cultural resources.

No known historic properties sensitive to visual considerations occur along Segment p-09. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment p-10
No sites previously recommended eligible, determined eligible, or previously unevaluated for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor Previously recorded sites within 0.5-mile of Segment p-10 include trails, indicating that this site type may occur in the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (62.9 percent), no sites eligible for inclusion in the NRHP are projected to occur in the 200-foot analysis corridor. Segment p-10 is thus considered to have a low sensitivity for cultural resources.

Segment p-11
No sites previously determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. Two cultural resources sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 3.3 sites per 100 acres. Previously recorded sites within 0.5-mile of Segment p-11 include trails, indicating that this site type may occur in the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (61.4 percent), a total of three sites unevaluated for NRHP significance eligible for inclusion are projected to occur in the 200-foot analysis corridor.

Table 4.6-7 Known Survey and Anticipated Cultural Resources in Segments by Alternative and Subalternative in the Copper Bottom Zone

SEGMENT NO.	ACRES (200-FT CORRIDOR)	PERCENTAGE OF SEGMENT SURVEYED (%)	DENSITY OF KNOWN SITES (PER 100 ACRES)[1]	COUNT OF KNOWN DETERMINED OR RECOMMENDED ELIGIBLE SITES	COUNT OF KNOWN UNEVALUATED/ UNKNOWN ELIGIBILITY SITES	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF NRHP-ELIGIBLE SITES[2]	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF SITES TO BE EVALUATED[2]
PROPOSED ACTION							
p-09	168.0	77.4	1.5	0	2	0.0/0	1.5/3
p-10	28.3	62.9	5.6	0	1	0.0/0	5.6/2
p-11	100.1	61.4	3.3	0	2	0.0/0	3.3/3
p-12	64.2	9.8	0.0	0	0	0.0/0	0.0/0
p-13	84.0	97.5	7.3	2	0	2.4/2	0.0/0
p-14	23.1	75.2	23.1	0	0	0.0/0	0.0/0
ALTERNATIVE 1							
i-06	176.2	37.7	1.5	0	0	0.0/0	0.0/0
i-07	154.7	33.3	7.8	0	3	0.0/0	5.8/9
ALTERNATIVE 2							
p-09	168.0	77.4	1.5	0	2	0.0/0	1.5/3
p-10	28.3	62.9	5.6	0	1	0.0/0	5.6/2
p-11	100.1	61.4	3.3	0	2	0.0/0	3.3/3
p-12	64.2	9.8	0.0	0	0	0.0/0	0.0/0
p-13	84.0	97.5	7.3	2	0	2.4/2	0.0/0
p-14	23.1	75.2	23.1	0	0	0.0/0	0.0/0

SEGMENT NO.	ACRES (200-FT CORRIDOR)	PERCENTAGE OF SEGMENT SURVEYED (%)	DENSITY OF KNOWN SITES (PER 100 ACRES)[1]	COUNT OF KNOWN DETERMINED OR RECOMMENDED ELIGIBLE SITES	COUNT OF KNOWN UNEVALUATED/ UNKNOWN ELIGIBILITY SITES	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF NRHP-ELIGIBLE SITES[2]	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF SITES TO BE EVALUATED[2]
ALTERNATIVE 2, SUBALTERNATIVE 2C							
cb-02	81.6	38.5	3.2	0	0	0.0/0	0.0/0
cb-04	45.7	45.2	14.6	0	3	0.0/0	14.6/7
cb-06	46.9	0.3	0.0	0	0	0.0/0	0.0/0
ALTERNATIVE 2, SUBALTERNATIVE 2D							
cb-03	106	15.6	12.0	1	0	6.0/6	0.0/0
ALTERNATIVE 3							
p-09	168.0	77.4	1.5	0	2	0.0/0	1.5/3
p-14	23.1	75.2	23.1	0	0	0.0/0	0.0/0
cb-01	77.9	4.8	0.0	0	0	0.0/0	0.0/0
cb-04	45.7	45.2	14.6	0	3	0.0/0	14.6/7
cb-05	107.9	8.7	0.0	0	0	0.0/0	0.0/0
ALTERNATIVE 3, SUBALTERNATIVE 3K							
p-10	28.3	62.9	5.6	0	0	0.0/0	0.0/0
cb-02	81.6	38.5	3.2	0	0	0.0/0	0.0/0

SEGMENT NO.	ACRES (200-FT CORRIDOR)	PERCENTAGE OF SEGMENT SURVEYED (%)	DENSITY OF KNOWN SITES (PER 100 ACRES)[1]	COUNT OF KNOWN DETERMINED OR RECOMMENDED ELIGIBLE SITES	COUNT OF KNOWN UNEVALUATED/ UNKNOWN ELIGIBILITY SITES	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF NRHP-ELIGIBLE SITES[2]	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF SITES TO BE EVALUATED[2]
ALTERNATIVE 3, SUBALTERNATIVE 3L							
i-06	176.2	37.7	1.5	0	0	0.0/0	0.0/0
x-08	32.4	23.5	13.2	1	0	13.2/4	0.0/0
p-12	64.2	9.8	0.0	0	0	0.0/0	0.0/0
p-13	84	97.5	7.3	2	0	2.4/2	0.0/0
ALTERNATIVE 4							
p-09	168.0	77.4	1.5	0	2	0.0/0	1.5/3
p-10	28.3	62.9	5.6	0	1	0.0/0	5.6/2
p-13	84.0	97.5	7.3	2	0	2.4/2	0.0/0
p-14	23.1	75.2	23.1	0	0	0.0/0	0.0/0
cb-02	81.6	38.5	3.2	0	0	0.0/0	0.0/0
cb-04	45.7	45.2	14.6	0	3	0.0/0	14.6/7
cb-06	46.9	0.3	0.0	0	0	0.0/0	0.0/0
ALTERNATIVE 4, SUBALTERNATIVE 4E							
cb-01	77.9	4.8	0	0	0	0.0/0	0.0/0
ALTERNATIVE 4, SUBALTERNATIVE 4F							
cb-05	107.9	8.7	0	0	0	0.0/0	0/0

SEGMENT NO.	ACRES (200-FT CORRIDOR)	PERCENTAGE OF SEGMENT SURVEYED (%)	DENSITY OF KNOWN SITES (PER 100 ACRES)[1]	COUNT OF KNOWN DETERMINED OR RECOMMENDED ELIGIBLE SITES	COUNT OF KNOWN UNEVALUATED/ UNKNOWN ELIGIBILITY SITES	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF NRHP-ELIGIBLE SITES[2]	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF SITES TO BE EVALUATED[2]
ALTERNATIVE 4, SUBALTERNATIVE 4G							
p-11	100.1	61.4	3.3	0	2	0.0/0	3.3/3
p-12	64.2	9.8	0.0	0	0	0.0/0	0.0/0
ALTERNATIVE 4, SUBALTERNATIVE 4H							
x-08	32.4	23.5	13.2	1	0	13.2/4	0.0/0
i-07	154.7	33.3	7.8	0	3	0.0/0	5.8/9

Note: see Section 4.6.5.1 for a discussion of how the density of projected sites was calculated.

[1]Density of known sites/100 acres includes sites that are previously recommended/determined ineligible for listing in the NRHP.

[2](/) is used in this column to indicate a separation of data values.

Segment p-12
No sites previously recommended/determined eligible or unevaluated for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. However, previously recorded sites within 0.5-mile of Segment p-12 include trails, indicating that this site type may occur in the 200-foot analysis corridor.

Only 9.8 percent of the 200-foot analysis corridor of Segment p-12 has been intensively surveyed for cultural resources. No sites were identified. Given the small sample size and negative results of the survey, no meaningful evaluation of potential site density or direct effect can be made.

Segment p-13
Two sites previously determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 7.3 eligible sites per 100 acres. Site AZ R:7:55 (ASM)/Limekiln Wash Intaglio, is located within the 200-foot analysis corridor.

No sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (97.5 percent), no additional sites eligible for inclusion in the NRHP are projected to occur in the 200-foot analysis corridor.

One NRHP-eligible site potentially sensitive to indirect visual impacts, the Limekiln Wash Intaglio, is located within the 200-foot analysis corridor of Segment p-13. If this site exhibits a high degree of integrity of setting, feeling, and association, an assessment of indirect visual effects of the Project features (such as transmission line structures and access roads) on its NRHP qualities would be required.

Segment p-14
No sites previously recommended, determined eligible, or previously unevaluated for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (75.2 percent), no sites eligible for inclusion in the NRHP are projected to occur in the 200-foot analysis corridor. Segment p-14 is thus considered to have a low sensitivity for cultural resources.

No known historic properties sensitive to visual considerations occur along Segment p-14, although some could be identified by future Class III survey field work of the direct effects analysis area and/or future studies of indirect effects to historic properties in the indirect effects APE. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment cb-01
No sites previously recommended eligible, determined eligible, or unevaluated for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. However, previously recorded sites within 0.5-mile of Segment cb-01 include trails, indicating that this site type may occur in the 200-foot analysis corridor.

Only 4.8 percent of the 200-foot analysis corridor of Segment cb-01 has been intensively surveyed for cultural resources. No cultural resources sites were identified. Given the small sample size and negative results of the survey, no meaningful evaluation of potential site density or direct effect can be made.

Segment cb-02

No sites previously recommended eligible, determined eligible, or previously unevaluated for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. Previously recorded sites within 0.5-mile of Segment cb-02 include trails, indicating that this site type may occur in the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (38.5 percent), no sites eligible for inclusion in the NRHP are projected to occur in the 200-foot analysis corridor.

Segment cb-03

One site previously recommended or determined eligible for inclusion in the NRHP has been previously recorded within the 200-foot analysis corridor for a total site density of 6.0 eligible sites per 100 acres. No sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor. Previously recorded sites within 0.5-mile of Segment cb-03 include trails, indicating that this site type may occur in the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (15.6 percent), a total of six sites eligible for inclusion in the NRHP are projected to occur in the 200-foot analysis corridor. However, due to the low percentage sample of existing survey coverage, the projected number of sites may be misrepresented.

Segment cb-04

No sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. Three sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 14.6 unevaluated sites per 100 acres.

Based on the extent of previous Class III survey coverage (45.2 percent), a total of seven sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor.

No known historic properties sensitive to visual considerations occur along Segment cb-04. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment cb-05

Only 8.7 percent of the 200-foot analysis corridor of Segment cb-05 has been intensively surveyed for cultural resources. No sites were identified. Given the small sample size and negative results of the survey, no meaningful evaluation of potential site density or direct effect within the 200-foot analysis corridor can be made. However, previously recorded sites within 0.5-mile of Segment cb-05 include trails, indicating that this site type may occur in the 200-foot analysis corridor.

Segment cb-06
Only 0.3 percent of the 200-foot analysis corridor of Segment cb-06 has been intensively surveyed for cultural resources. No sites were identified. Given the small sample size and negative results of the survey, no meaningful evaluation of potential site density or direct effect can be made. However, previously recorded sites within 0.5-mile of Segment cb-06 include trails, indicating that this site type may occur in the 200-foot analysis corridor.

Segment i-06
A total of 37.7 percent of the 200-foot analysis corridor of Segment i-06 has been intensively surveyed for cultural resources. No sites were identified. Given negative results of the survey, the sensitivity of Segment i-06 for cultural resources is considered to be low.

No known historic properties sensitive to visual considerations occur along Segment i-06. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment i-07
No sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. Three sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 5.8 unevaluated sites per 100 acres. Previously recorded sites within 0.5-mile of Segment i-07 include trails and intaglios, indicating that these site types may occur in the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (33.3 percent), a total of nine sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor.

Segment x-08
One site previously recommended or determined eligible for inclusion in the NRHP has been previously recorded within the 200-foot analysis corridor for a total site density of 13.2 eligible sites per 100 acres. No sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor. Previously recorded sites within 0.5-mile of Segment x-08 include trails, indicating that this site type may occur in the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (23.5 percent), a total of four sites eligible for inclusion in the NRHP are projected to occur in the 200-foot analysis corridor.

4.6.5.5 Colorado River and California Zone

<u>Direct and Indirect Segment-specifics Effects</u>

Refer to Table 4.6-8 for data associated with the following segment discussions.

Segment p-15e
No sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. Three sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 14.1 unevaluated sites per 100 acres.

Based on the extent of previous Class III survey coverage (31.1 percent), a total of ten sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor.

One NRHP-listed site potentially sensitive to indirect visual impacts, the Ripley Intaglio Site, is located within the indirect effects analysis area of Segment p-15e. If this site exhibits a high degree of integrity of setting, feeling, and association, an assessment of indirect visual effects of the Project features (such as transmission line structures and access roads) on its NRHP qualities would be required.

Segment p-15w
No sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. A total of eight sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 15.3 unevaluated sites per 100 acres.

Based on the extent of previous Class III survey coverage (32.4 percent), a total of 25 sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor.

No known historic properties sensitive to visual considerations occur along Segment p-15w. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment p-16
No sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. Five sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 29.6 unevaluated sites per 100 acres. Previously recorded sites within 0.5-mile of Segment p-16 include trails, indicating that this site type may occur in the 200-foot analysis corridor. Segment p-16 is further discussed in the Project's sensitivity analysis (Appendix 3B).

Based on the extent of previous Class III survey coverage (14.6 percent), a total of 34 sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor. However, due to the low percentage sample of existing survey coverage, the projected number of sites may be misrepresented.

Table 4.6-8 Known Survey and Anticipated Cultural Resources in Segments by Alternative and Subalternative in the Colorado River and California Zone

SEGMENT NO.	ACRES (200-FT CORRIDOR)	PERCENTAGE OF SEGMENT SURVEYED (%)	DENSITY OF KNOWN SITES (PER 100 ACRES)[1]	COUNT OF KNOWN DETERMINED OR RECOMMENDED ELIGIBLE SITES	COUNT OF KNOWN UNEVALUATED/ UNKNOWN ELIGIBILITY SITES	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF NRHP-ELIGIBLE SITES[2]	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF SITES TO BE EVALUATED[2]
PROPOSED ACTION							
p-15e	68.5	31.1	14.1	0	3	0.0/0	14.1/10
p-15w	161.5	32.4	15.3	0	2	0.0/0	15.3/25
p-16	116.1	14.6	47.3	0	5	0.0/0	29.6/34
p-17	71.2	100	35.1	2	7	2.8/2	9.8/7
p-18	62.9	100	22.3	1	7	1.6/1	11.1/7
ALTERNATIVE 1							
i-08s	32.5	28.9	0.0	0	0	0.0/0	0.0/0
ca-04	9.4	21.3	0.0	0	0	0.0/0	0.0/0
ca-05	161.9	3.4	109.1	0	6	0.0/0	109.1/177
ca-06	64.1	33.1	4.7	0	1	0.0/0	4.7/3
ca-07	74.7	70.4	3.8	0	0	0.0/0	0.0/0
ca-09	63.1	100	3.2	0	0	0.0/0	0.0/0
x-09	19.8	30.3	0.0	0	0	0.0/0	0.0/0
x-19	24.2	100.0	16.5	0	3	0.0/0	12.4/3

SEGMENT NO.	ACRES (200-FT CORRIDOR)	PERCENTAGE OF SEGMENT SURVEYED (%)	DENSITY OF KNOWN SITES (PER 100 ACRES)[1]	COUNT OF KNOWN DETERMINED OR RECOMMENDED ELIGIBLE SITES	COUNT OF KNOWN UNEVALUATED/ UNKNOWN ELIGIBILITY SITES	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF NRHP-ELIGIBLE SITES[2]	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF SITES TO BE EVALUATED[2]
ALTERNATIVE 1, SUBALTERNATIVE 1E							
ca-01	162.2	2.0	272.7	0	9	0.0/0	272.7/442
x-10	31.1	60.8	0.0	0	0	0.0/0	0.0/0
x-12	30.7	4.9	133.3	0	2	0.0/0	133.3/41
ALTERNATIVE 2							
p-15e	68.5	31.1	14.1	0	3	0.0/0	14.1/10
p-15w	161.5	32.4	15.3	0	8	0.0/0	15.3/25
p-16	116.1	14.6	47.3	0	5	0.0/0	29.6/34
x-15	35.6	62.9	0.0	0	0	0.0/0	0.0/0
x-16	57.3	13.3	26.3	1	1	13.2/8	13.2/8
ca-07	74.7	70.4	3.8	0	0	0.0/0	0.0/0
ca-09	63.1	100	3.2	0	0	0.0/0	0.0/0
x-19	24.2	100.0	16.5	0	3	0.0/0	12.4/3
ALTERNATIVE 2, SUBALTERNATIVE 2E							
x-13	48.7	3.3	62.5	0	1	0.0/0	62.5/30
ca-02	82.8	10.1	35.7	0	3	0.0/0	35.7/30
ALTERNATIVE 3							
ca-01	162.2	2.0	272.7	0	9	0.0/0	272.7/442
ca-06	64.1	33.1	4.7	0	1	0.0/0	4.7/3

SEGMENT NO.	ACRES (200-FT CORRIDOR)	PERCENTAGE OF SEGMENT SURVEYED (%)	DENSITY OF KNOWN SITES (PER 100 ACRES)[1]	COUNT OF KNOWN DETERMINED OR RECOMMENDED ELIGIBLE SITES	COUNT OF KNOWN UNEVALUATED/ UNKNOWN ELIGIBILITY SITES	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF NRHP-ELIGIBLE SITES[2]	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF SITES TO BE EVALUATED[2]
ca-07	74.7	70.4	3.8	0	0	0.0/0	0.0/0
ca-09	63.1	100	3.2	0	0	0.0/0	0.0/0
cb-10	46.8	14.1	0.0	0	0	0.0/0	0.0/0
x-11	51.7	1.5	125.0	0	1	0.0/0	125.0/65
x-12	30.7	4.9	133.3	0	2	0.0/0	133.3/41
x-19	24.2	100.0	16.5	0	3	0.0/0	12.4/3
ALTERNATIVE 3, SUBALTERNATIVE 3M							
p-15e	68.5	31.1	14.1	0	3	0.0/0	14.1/10
p-15w	161.5	32.4	15.3	0	8	0.0/0	15.3/25
x-13	48.7	3.3	62.5	0	1	0.0/0	62.5/30
ALTERNATIVE 4							
p-15e	68.5	31.1	14.1	0	3	0.0/0	14.1/10
p-15w	161.5	32.4	15.3	0	8	0.0/0	15.3/25
ca-06	64.1	33.1	4.7	0	1	0.0/0	4.7/3
ca-07	74.7	70.4	3.8	0	0	0.0/0	0.0/0
ca-09	63.1	100	3.2	0	0	0.0/0	0.0/0
x-12	30.7	4.9	133.3	0	2	0.0/0	133.3/41
x-13	48.7	3.3	62.5	0	1	0.0/0	62.5/30

SEGMENT NO.	ACRES (200-FT CORRIDOR)	PERCENTAGE OF SEGMENT SURVEYED (%)	DENSITY OF KNOWN SITES (PER 100 ACRES)[1]	COUNT OF KNOWN DETERMINED OR RECOMMENDED ELIGIBLE SITES	COUNT OF KNOWN UNEVALUATED/ UNKNOWN ELIGIBILITY SITES	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF NRHP-ELIGIBLE SITES[2]	DENSITY (PER 100 ACRES)/ PROJECTED COUNT OF SITES TO BE EVALUATED[2]
x-19	24.2	100.0	16.5	0	3	0.0/0	12.4/3
ALTERNATIVE 4, SUBALTERNATIVE 4K							
i-08s	32.5	28.9	0.0	0	0	0.0/0	0.0/0
ca-04	9.4	21.3	0.0	0	0	0.0/0	0.0/0
x-09	19.8	30.3	0.0	0	0	0.0/0	0.0/0
ALTERNATIVE 4, SUBALTERNATIVE 4L							
cb-10	46.8	14.1	0.0	0	0	0.0/0	0.0/0
x-11	51.7	1.5	125.0	0	1	0.0/0	125.0/65
ALTERNATIVE 4, SUBALTERNATIVE 4M							
ca-01	162.2	2.0	272.7	0	9	0.0/0	272.7/442
ALTERNATIVE 4, SUBALTERNATIVE 4N							
x-10	31.1	60.8	0.0	0	0	0.0/0	0.0/0
ALTERNATIVE 4, SUBALTERNATIVE 4P							
p-16	116.1	14.6	47.3	0	5	0.0/0	29.6/34
p-17	71.2	100	35.1	2	7	2.8/2	9.8/7
p-18	62.9	100	22.3	1	7	1.6/1	11.1/7

Note: see Section 4.6.5.1 for a discussion of how the density of projected sites was calculated.

[1]Density of known sites/100 acres includes sites that are previously recommended/determined ineligible for listing in the NRHP.

[2](/) is used in this column to indicate a separation of data values.

Segment p-17

A total of two sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 2.8 eligible sites per 100 acres. A total of seven sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 9.8 unevaluated sites per 100 acres.

Based on the extent of previous Class III survey coverage (100.0 percent), a total of two sites eligible for inclusion in the NRHP and a total of seven sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor. One of these sites contains known human remains and is within an existing access road. AECOM (2012) describes the eastern base of the Palo Verde Mesa where Segment p-17 is located, as a culturally and biologically sensitive area of great importance. Segment p-17 is further discussed in the Project's sensitivity analysis (Appendix 3B).

Direct impacts due to construction could range between moderate (if eligible sites could be avoided by Project design) and major (if eligible sites could not be avoided by Project design). Any impact to human remains would be major and subject to NAGPRA regulations.

One NRHP-listed archaeological district containing petroglyphs and intaglios (the Mule Tank Discontiguous Rock Art District) is potentially sensitive to indirect visual impacts and is located within line of site of Segment p-17. If sites within this NRHP-listed district exhibit a high degree of integrity of setting, feeling, and association, an assessment of indirect visual effects of the Project features (such as transmission line structures and access roads) on their NRHP qualities would be required.

Segment p-18

One site previously recommended or determined eligible for inclusion in the NRHP has been previously recorded within the 200-foot analysis corridor for a total site density of 1.6 eligible sites per 100 acres. A total of seven sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 9.8 unevaluated sites per 100 acres.

Based on the extent of previous Class III survey coverage (100 percent), one site eligible for inclusion in the NRHP and a total of seven sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor. AECOM (2012) describes the eastern base of the Palo Verde Mesa where Segment p-18 is located, as a culturally and biologically sensitive area of great importance. Segment p-18 is further discussed in the Project's sensitivity analysis (Appendix 3B). Direct impacts due to construction could range between moderate (if eligible sites could be avoided by Project design) and major (if eligible sites could not be avoided by Project design). Any impact to human remains would be major and subject to NAGPRA regulations.

Given the cultural and environmental context of this segment, it may contain classes of archaeological sites considered to be sensitive to visual effects. If sites along this segment exhibit a high degree of integrity of setting, feeling, and association, and also qualify as NRHP-eligible historic properties, an assessment of indirect visual effects of the Project features (such as transmission line structures and access roads) on their NRHP qualities would be required.

Segment ca-01
No sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. A total of nine sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 272.7 unevaluated sites per 100 acres.

Based on the extent of previous Class III survey coverage (2.0 percent), a total of 442 cultural resources sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor. However, due to the low percentage sample of existing survey coverage, it is highly likely that the projected number of sites is misrepresented.

No known historic properties sensitive to visual considerations occur along Segment ca-01. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment ca-02
No sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. A total of three sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 35.7 unevaluated sites per 100 acres. Segment ca-02 is further discussed in the Project's sensitivity analysis (Appendix 3B).

Based on the extent of previous Class III survey coverage (10.1 percent), a total of 30 cultural resources sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor. However, due to the low percentage sample of existing survey coverage, it is possible that the projected number of sites is misrepresented.

No known historic properties sensitive to visual considerations occur along Segment ca-02. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment ca-04
A total of 25 percent of the 200-foot analysis corridor of Segment ca-04 has been intensively surveyed for cultural resources. No sites were identified. Given the sample size and negative results of the survey, this segment is considered to have a low sensitivity for cultural resources.

No known historic properties sensitive to visual considerations occur along Segment ca-04. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment ca-05
No sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. Six sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 109.1 unevaluated sites per 100 acres.

Based on the extent of previous Class III survey coverage (3.4 percent), a total of 177 sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor. However, due to the low percentage sample of existing survey coverage, the projected number of sites may be misrepresented.

No known historic properties sensitive to visual considerations occur along Segment ca-05. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment ca-06
No sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. One site previously unevaluated for the NRHP has been previously recorded within the 200-foot analysis corridor for a total site density of 4.7 unevaluated sites per 100 acres.

Based on the extent of previous Class III survey coverage (33.1 percent), a total of three sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor.

No known historic properties sensitive to visual considerations occur along Segment ca-06. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment ca-07
A total of 70.4 percent of the 200-foot analysis corridor of Segment ca-07 has been intensively surveyed for cultural resources. No sites were identified. Given the sample size and negative results of the survey, this segment is considered to have a low sensitivity for cultural resources.

Segment ca-07 is further discussed in the Project's sensitivity analysis (Appendix 3B).

No known historic properties sensitive to visual considerations occur along Segment ca-07. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment ca-09
A total of 100 percent of the 200-foot analysis corridor of Segment ca-09 has been intensively surveyed for cultural resources. No sites were identified. Based on the high extent of previous Class III survey coverage with negative results, Segment ca-09 demonstrates a low sensitivity for cultural resources. As a result, direct impacts due to construction could range between no impact and moderate (if potentially identified historic properties could be avoided by Project design).

No known historic properties sensitive to visual considerations occur along Segment ca-09. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment cb-10
Only 14.1 percent of the 200-foot analysis corridor of Segment cb-10 has been intensively surveyed for cultural resources. No sites were identified. Given the small sample size and negative results of the survey, no meaningful evaluation of potential site density or direct effect can be made. Previously recorded sites within 0.5-mile of Segment cb-10 include trails, indicating that this site type may occur in the 200-foot analysis corridor.

Segment i-08s
A total of 28.9 percent of the 200-foot analysis corridor of Segment i-08s has been intensively surveyed for cultural resources. No sites were identified. Given the sample size and negative results of the survey, this segment is considered to have a low sensitivity for cultural resources.

However, previously recorded sites within 0.5-mile of Segment i-08s include trails, indicating that this site type may occur in the 200-foot analysis corridor.

Segment x-10
A total of 60.8 percent of the 200-foot analysis corridor of Segment x-10 has been intensively surveyed for cultural resources. No sites were identified. Given the sample size and negative results of the survey, this segment is considered to have a low sensitivity for cultural resources.

No known historic properties sensitive to visual considerations occur along Segment x-10. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment x-11
No sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. One site previously unevaluated for the NRHP has been previously recorded within the 200-foot analysis corridor for a total site density of 125.0 unevaluated sites per 100 acres. One previously recorded site within 0.5-mile of Segment x-11 includes a possible intaglio, indicating that this site type may occur in the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (1.5 percent), a total of 65 sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor. However, due to the low percentage sample of existing survey coverage, it is possible that the projected number of sites is misrepresented.

Segment x-12
No sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. Two sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 133.3 unevaluated sites per 100 acres.

Based on the extent of previous Class III survey coverage (4.9 percent), a total of 41 sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor. However, due to the low percentage sample of existing survey coverage, it is highly likely that the projected number of sites is misrepresented.

No known historic properties sensitive to visual considerations occur along Segment x-12. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment x-13
No sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. One site previously unevaluated for the

NRHP has been previously recorded within the 200-foot analysis corridor for a total site density of 62.5 unevaluated sites per 100 acres.

Based on the extent of previous Class III survey coverage (3.3 percent), a total of 30 sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor. However, due to the low percentage sample of existing survey coverage, it is highly likely that the projected number of sites is misrepresented.

No known historic properties sensitive to visual considerations occur along Segment x-13. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

Segment x-15
No sites previously recommended/determined eligible or unevaluated for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. However, previously recorded sites within 0.5-mile of Segment x-15 include trails, indicating that this site type may occur in the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (62.9 percent) with negative results, Segment x-15 demonstrates a low sensitivity for cultural resources.

Segment x-16
One site previously recommended or determined eligible for inclusion in the NRHP ha been previously recorded within the 200-foot analysis corridor for a total site density of 13.2 sites per 100 acres. One site previously unevaluated for the NRHP has been previously recorded within the 200-foot analysis corridor for a total site density of 13.2 unevaluated sites per 100 acres. Previously recorded sites within 0.5-mile of Segment x-16 include trails, indicating that this site type may occur in the 200-foot analysis corridor.

Based on the extent of previous Class III survey coverage (13.3 percent), a total of eight sites eligible for the NRHP are projected to occur in the 200-foot analysis corridor. An additional eight sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor. However, due to the low percentage sample of existing survey coverage, it is likely that the projected number of sites is misrepresented.

Segment x-19
No sites previously recommended or determined eligible for inclusion in the NRHP have been previously recorded within the 200-foot analysis corridor. A total of three sites previously unevaluated for the NRHP have been previously recorded within the 200-foot analysis corridor for a total site density of 12.4 unevaluated sites per 100 acres.

Based on the extent of previous Class III survey coverage (100 percent), three sites requiring NRHP evaluation are projected to occur in the 200-foot analysis corridor.

No known historic properties sensitive to visual considerations occur along Segment x-19. Based on the available data, there are no known indirect visual impacts to known historic properties from structures along this segment.

4.6.6 Operations, Maintenance, and Decommissioning

The anticipated operations and maintenance duration is 50 years. Though most impacts to historic properties are expected to occur in association with construction, some continuing project-related activities would affect historic properties. The transmission lines and facilities would be inspected annually or as required by using fixed-wing aircraft, helicopters, ground vehicles, all-terrain vehicles, or on foot. Maintenance vehicles would generally require access to the ROW once yearly. Where long-term access is required for maintenance and operation, a regular maintenance program may include, but would not be limited to, brushing, blading, ditching, installing culverts, and surfacing. Maintenance of the line and facilities would occur on an as-needed basis. The SCS would require minor maintenance over a 3- to 5-day period once every year.

Repair and maintenance may require the same type of equipment and machinery used during construction, including power augers for hole drilling, backhoes for excavation, water trucks, and/or concrete trucks and cranes for structure erection. Other required equipment may include power tensioners, pullers, wire trailers, crawler tractors, and trucks and pickups for hauling materials, tools, and workers. Helicopters may be used in some circumstances. The frequency and duration of repair activities is unknown.

The maintenance and operating activities would have the potential to affect historic properties if they take place in sensitive areas identified by Class III survey. Areas requiring cultural resources monitoring during these activities would be identified and discussed in the PA. No Project activities requiring new ground disturbance would proceed without a cultural resources Class III survey to identify and evaluate any potential historic properties that may be present.

In addition, new roads established to support construction may result in increased access into areas that were previously inaccessible and/or used only intermittently. This increased access could result in unanticipated adverse effects to, or vandalism of, historic properties. Measures to resolve potential adverse effects to historic properties as a result of improved access would be included in the PA and the ROD.

Impacts associated with decommissioning would be similar to those identified for construction under the Proposed Action or Action Alternatives. The ROW would stipulate, and the BLM shall ensure, that decommissioning would be considered a new action for Section 106 review, and that historic properties potentially affected by decommissioning would be considered in accordance with the pertinent laws, regulations, and policies extant at the time.

4.6.7 Measures for the Resolution of Adverse Effects

Resolution measures for adverse effects to historic properties would be outlined in the PA and HPTPs (APM-CULT-01, APM-CULT-03). The PA has been developed (Appendix 2D) and would direct resolution measures. The PA ensures the priority of avoidance of historic properties during construction phases, and ensures the process of identifying, evaluating, and avoiding or mitigating is followed and would continue even after the NEPA process is complete. HPTPs would be developed in accordance with the stipulations contained in the PA following the Class III survey identification efforts and indirect studies. Measures contained in the PA and HPTPs would be implemented prior to and during construction and post-construction during maintenance activities and operations (APM-CULT-01, BMP-CULT-02, BMP-CULT-04). Resolution measures for adverse effects to historic properties located within the CDCA Plan area are further outlined by specific compliance requirements discussed in Section 4.6.8. Tribal consultation is on-going.

APMs and BMPs for cultural resources are contained in Appendix 2A, Section 2A.6.

4.6.8 Construction of Full Route Alternative and Subalternative Effects

In the following section, discussion of the percentage of previous Class III survey coverage is presented in a combined total of acreage examined to provide a cumulative percentage. In this way, the percentage of Class III survey coverage is comparable for comparison between alternative and subalternative segments.

4.6.8.1 Proposed Action

A total of 66 NRHP-eligible and unevaluated sites have been previously recorded within the 200-foot analysis corridor of the Proposed Action. Based on an extrapolation of the number of known cultural resource sites in the acreage surveyed, a total of 164 NRHP-eligible or unevaluated sites are projected to occur within the 200-foot analysis corridor of the Proposed Action (Tables 4.6-5, 4.6-6, 4.6-7, and 4.6-8). Direct impacts due to construction could range between negligible (if eligible sites could be avoided by Project design) and major (if eligible sites could not be avoided by Project design). The Proposed Action has the potential to affect more known cultural resources sites than the other Action Alternatives.

Sensitive sites known or projected to occur in the 200-foot Proposed Action analysis corridor include trails, intaglios, and prehistoric habitation sites with human remains. The Limekiln Wash Intaglio site is located within the 200-foot analysis corridor within Segment p-13.

Segments p-17 and p-18 of the Proposed Action cross the eastern base of the Palo Verde Mesa, a culturally and biologically sensitive area (AECOM 2012). Direct impacts due to construction could range between negligible (if eligible sites could be avoided by Project design) and major (if eligible sites could not be avoided by Project design). However, any impact to human remains would be major and subject to protocol and processes as presented in the NAGPRA on Federal land and under the California Health and Safety Code Section 7050.5, “Discovery of Human Remains,” on state or private land.

Indirect visual effects from the construction of the Proposed Action could occur for the following if they qualify as NRHP-eligible historic properties and exhibit a high degree of integrity of setting, feeling, and association:

- The Indian Well Site, located within the 1-mile-wide corridor of the Proposed Action.
- An undocumented rock ring site, located within the 1-mile-wide corridor of the Proposed Action.
- The Limekiln Wash Intaglio, located in the 200-foot analysis corridor of the Proposed Action.
- The NRHP-listed Ripley Intaglio Site, located within the 5-mile indirect effects analysis area of the Proposed Action.

- The NRHP-listed Mule Tank Discontiguous Rock Art District, a prehistoric district, located approximately within the 5-mile indirect effects analysis area of the Proposed Action.

The Proposed Action parallels the existing DPV1 transmission line. The construction of additional transmission structures may create additional visual intrusions on individual properties' NRHP qualities of integrity. These potential effects would be assessed as part of the indirect effects analysis. The indirect effects analysis would occur after the execution of the PA and signing of the ROD. If effects to NRHP qualities are measurable this would constitute a permanent cumulative effect.

Prehistoric trail segments have been recorded within 0.5 mile of Segments p-04, p-06, p-07, p-09, p-10, p-11, p-12, p-13, p-14, p-15e. If these trails qualify as NRHP-eligible properties and exhibit a high degree of setting, feeling, and association, the construction of additional structures may create additional visual intrusions that affect their NRHP character-defining qualities. These potential effects would be assessed as part of the indirect effects analysis. The indirect effects analysis would occur after the execution of the PA and signing of the ROD. If effects to NRHP character-defining qualities are measurable this would constitute a permanent cumulative effect.

Other indirect effects to historic properties could occur if Project roads enhance accessibility, potentially making previously inaccessible properties more vulnerable to increased visitation and vandalism.

Resolution Measures

Potential adverse effects to historic properties would be resolved in accordance with the provisions of the PA and the development of specific HPTPs. Avoidance of cultural resources by final design and construction would be the preferred adverse effect resolution measure. APM-CULT-01 and BMP-CULT-03 (Appendix 2A, Section 2A.6) would be applicable to the resolution of potential adverse effect. For portions of the Project within the CDCA, adverse effect resolution measures as outlined in LUPA-CUL-4 would also be applicable.

4.6.8.2 Alternative 1: I-10 Route

A total of 23 NRHP-eligible and unevaluated sites have been previously recorded within the 200-foot analysis corridor of Alternative 1. Based on an extrapolation of the number of known cultural resources sites in acreage surveyed, a total of 75 NRHP-eligible or unevaluated sites are projected to occur within the 200-foot analysis corridor of Alternative 1 (Tables 4.6-5, 4.6-6, 4.6-7, and 4.6-8). However, this projected count may be influenced by skewed metrics resulting from lower Class III survey coverage (less than five percent) of Segments i-03 (4.2 percent) and ca-05 (3.4 percent). Direct impacts due to construction could range between negligible (if NRHP-eligible sites could be avoided by Project design) and major (if NRHP-eligible sites could not be avoided by Project design). Alternative 1 would affect fewer cultural resources than the Proposed Action and Alternatives 2 through 4.

Sensitive sites projected to occur in the 200-foot Alternative 1 analysis corridor include prehistoric trails and intaglios. These site types have been recorded within one-half mile of Segments i-03, qs-01, qs-02, i-06, i-07, i-08s, and ca-09. The NRHP eligibility of these sites is not known at this time. If these trails and intaglios qualify as NRHP-eligible properties and exhibit a high degree of setting, feeling, and association, the construction of structures may create visual intrusions that affect the NRHP character-defining qualities of these sites. These potential effects would be assessed as part of the indirect effects analysis. The indirect effects analysis would occur after the execution of the PA and signing of the ROD. If effects to NRHP character-defining qualities are measurable, it would constitute a permanent cumulative effect.

Other indirect effects to historic properties could occur if Project roads enhance accessibility, potentially making previously inaccessible properties more vulnerable to increased visitation and vandalism.

Resolution Measures

Potential adverse effects to historic properties would be resolved in accordance with the provisions of the PA and specific HPTPs. Avoidance of cultural resources by final design and construction would be the preferred adverse effect resolution measure. APM-CULT-01 and BMP-CULT-03 would be applicable to the resolution of potential adverse effect.

Subalternatives to Alternative 1 (1A through 1E)

Resolution measures for all of the subalternative routes would be the same. Any potential adverse effects to historic properties would be resolved in accordance with the provisions of the PA and specific HPTPs. Avoidance of historic properties by final design and construction would be the preferred adverse effect resolution measure.

Subalternative 1A

Subalternative 1A would result in a reduced visual impact (fewer planned transmission structures) and less potential to affect historic properties by ground disturbance (smaller footprint of temporary and permanent disturbance).

A total of 7.6 percent of the segments of Subalternative 1A have been investigated by Class III survey, while 13.3 percent of Segment i-01 (Alternative 1) has been previously investigated. A total of 26 NRHP-eligible sites or sites requiring NRHP evaluation are projected to occur within Subalternative 1A, and 19 NRHP-eligible cultural resource sites or sites requiring NRHP evaluation are projected to occur along the portion of Alternative 1 that Subalternative 1A would replace.

While the data suggest that Subalternative 1A has a higher potential to affect historic properties based on the disturbance footprint, projected site counts for both Subalternative 1A and Alternative 1 may be the result of low representative Class III survey samples.

Subalternative 1B

Compared to Alternative 1, Subalternative 1B results in a greater visual impact (higher count of transmission structures) and a greater potential to affect historic properties by ground disturbance (larger footprint of temporary and permanent disturbance).

A total of 2.5 percent of the segments of Subalternative 1B have been investigated by Class III survey, while 13.3 percent of Segment i-01 (Alternative 1) has been previously investigated. Eight-two NRHP-eligible sites or sites requiring NRHP evaluation are projected to occur within Subalternative 1B, and 19 NRHP-eligible cultural resource sites or sites requiring NRHP evaluation are projected to occur along the portion of Alternative 1 that Subalternative 1B would replace.

While the data suggest that Subalternative 1B has a higher potential to affect historic properties based on projected site counts and the disturbance footprint, projected site counts for Subalternative 1B and Alternative 1 may be the result of low representative Class III survey samples.

Subalternative 1C
Compared to Alternative 1, Subalternative 1C results in a greater visual impact (higher count of transmission structures) and a greater potential to affect historic properties by ground disturbance (larger footprint of temporary and permanent disturbance).

A total of 2.0 percent of the segments of Subalternative 1C have been investigated by Class III survey, while 9.2 percent of Segments i-04 and i-05 (Alternative 1) has been previously investigated. A total of 102 NRHP-eligible sites are projected to occur within Subalternative 1C, and a total of 3 sites requiring NRHP evaluation are projected to occur along the portion of Alternative 1 that Subalternative 1C would replace.

While the data suggest that Subalternative 1C has a higher potential to affect historic properties based on the disturbance footprint, projected site counts for Subalternative 1C and Alternative 1 may be the result of low representative Class III survey sample.

Subalternative 1D
Compared to Alternative 1, Subalternative 1D would result in a reduced visual impact (fewer count of transmission structures) and less potential to affect historic properties by ground disturbance (smaller footprint of temporary and permanent disturbance).

A total of 89.6 percent of Subalternative 1D has been investigated by Class III survey, while only 2.0 percent of Segment i-04 (Alternative 1) has been previously investigated. Two NRHP-eligible sites or sites requiring NRHP evaluation are projected to occur within Subalternative 1D, and no NRHP-eligible cultural resource sites or sites requiring NRHP evaluation are projected to occur along the portion of Alternative 1 that Subalternative 1D would replace.

The data suggest that Subalternative 1D and Alternative 1 would have a comparable potential to affect historic properties based on projected site counts and the disturbance footprint.

Subalternative 1E
Compared to Alternative 1, Subalternative 1E would result in a greater visual impact (higher count of transmission structures) and a greater potential to affect historic properties by ground disturbance (greater footprint of temporary and permanent disturbance).

A total of 10.6 percent of Subalternative 1E has been investigated by Class III survey, while only 3.4 percent of Segment ca-05 (Alternative 1) has been previously investigated. A total of 104 cultural resource sites requiring NRHP evaluation are projected to occur within Subalternative 1E, and 177 cultural resource sites NRHP-eligible cultural resource sites or sites requiring NRHP evaluation are projected to occur along the portion of Alternative 1 that Subalternative 1E would replace.

While the data suggests that Subalternative 1E has a lower potential to affect historic properties based on the disturbance footprint, projected site counts for Subalternative 1E and for Alternative 1 may be the result of low representative Class III survey samples.

4.6.8.3 Alternative 2: BLM Utility Corridor Route

A total of 50 NRHP-eligible and NRHP-unevaluated cultural resources sites have been previously recorded within the 200-foot analysis corridor of Alternative 2. A total of 150 NRHP-eligible or NRHP-unevaluated cultural resources sites are projected to occur within the 200-foot analysis corridor of Alternative 2 (Tables 4.6-5, 4.6-6, 4.6-7, and 4.6-8). However, this high projected count may be influenced by skewed metrics resulting from lower Class III survey coverage of Alternative 2 Segment x-07 (3.0 percent) and Segment i-03 (4.2 percent). Direct impacts due to construction could range between negligible (if NRHP-eligible sites could be avoided by Project design) and major (if NRHP-eligible sites could not be avoided by Project design). Alternative 2 would impact more known cultural resources sites than Alternatives 1, 3, and 4, and less than the Proposed Action.

Sensitive sites projected to occur in the Alternative 2 200-foot analysis corridor include prehistoric trails and intaglios. These site types have been recorded within one-half mile of Segments i-03, qs-01, p-09, p-10, p-11, p-12, p-13, p-14, p-15e, p-16, x-07, x-15, x-16, and ca-09. The NRHP eligibility of all of these sites is not known at this time. If these trails and intaglios qualify as NRHP-eligible properties and exhibit a high degree of setting, feeling, and association, the construction of structures may create visual intrusions that affect the NRHP character-defining qualities of these sites. These potential effects would be assessed as part of the indirect effects analysis. The indirect effects analysis would occur after the execution of the PA and signing of the ROD. If effects to NRHP character-defining qualities are measurable, it would constitute a permanent cumulative effect.

Other indirect effects to historic properties could occur if Project roads enhance accessibility, potentially making previously inaccessible properties more vulnerable to increased visitation and vandalism.

Indirect visual effects from the construction of Alternative 2 could occur to the following historic properties:

- The Limekiln Wash Intaglio, located within the 200-foot analysis corridor of Alternative 2 Segment p-13.
- The NRHP-listed Ripley Intaglio Site, within the 5-mile indirect effects analysis area of Alternative 2 Segment p-15e.

Both Segments p-13 and p-15e parallel the existing DPV1 transmission line. The construction of additional transmission structures may create additional visual intrusions on individual properties' NRHP qualities of integrity. These potential effects would be assessed as part of the indirect effects analysis. The indirect effects analysis would occur after the execution of the PA and signing of the ROD. If effects to NRHP qualities are measurable this would constitute a permanent cumulative effect.

Resolution Measures

Potential adverse effects to historic properties would be resolved in accordance with the provisions of the PA and specific HPTPs. Avoidance of historic properties by final design and construction would be the preferred adverse effect resolution measure. APM-CULT-01 and BMP-CULT-03 would be applicable to the resolution of potential adverse effect. For portions of the Project within the CDCA, adverse effect resolution measures as outlined in LUPA-CUL-4 would also be applicable.

Subalternatives to Alternative 2 (2A through 2E)

Resolution measures for all of the subalternative routes would be the same as described for Alternative 2.

Subalternative 2A
Compared to Alternative 2, Subalternative 2A would result in a greater visual impact (higher count of transmission structures) but a comparable amount of ground disturbance (comparable footprint of temporary and permanent disturbance).

A total of 5.4 percent of the segments of Subalternative 2A has been investigated by Class III survey, while 37.9 percent of Segments p-01 and i-01 (Alternative 2) have been previously investigated. A total of 37 NRHP-eligible cultural resource sites are projected to occur within Subalternative 2A, and 38 NRHP-eligible sites or sites requiring NRHP evaluation are projected to occur along the portion of Alternative 2 that Subalternative 2A would replace.

While the data suggest that Subalternative 2A has a slightly higher potential to affect historic properties based on the disturbance footprint, projected site counts for Subalternative 2A may be the result of low representative Class III survey sample.

Subalternative 2B
Compared to Alternative 2, Subalternative 2B would result in a greater visual impact (higher count of transmission structures) and a greater potential to affect historic properties by ground disturbance (greater footprint of temporary and permanent disturbance).

A total of 12.7 percent of the segments of Subalternative 2B have been investigated by Class III survey, while 13.3 percent of Segment i-01 (Alternative 2) has been previously investigated. A total of 40 NRHP-eligible cultural resource sites or sites requiring NRHP evaluation are projected to occur within Subalternative 2B, and 19 NRHP-eligible cultural resource sites or sites requiring NRHP evaluation are projected to occur along the portion of Alternative 2 that Subalternative 2B would replace.

While the data suggest that Subalternative 2B has a higher potential to affect historic properties based on the disturbance footprint, projected site counts for both Subalternative 2B and Alternative 2 may be the result of low representative Class III survey samples.

Subalternative 2C
Compared to Alternative 2, Subalternative 2C would result in a comparable visual impact (comparable count of transmission structures) and a lower potential to affect historic properties by ground disturbance (smaller footprint of temporary and permanent disturbance).

A total of 29.9 percent of the segments of Subalternative 2C have been investigated by Class III survey, while 41.3 percent of Segments p-11 and p-12 (Alternative 2) have been previously investigated. Ten sites requiring NRHP evaluation are projected to occur within Subalternative 2C, and two NRHP-eligible cultural resource sites are projected to occur along the portion of Alternative 2 that Subalternative 2C would replace.

The data suggest that Subalternative 2C has a higher potential to affect historic properties based on projected site counts and the disturbance footprint.

Subalternative 2D
Compared to Alternative 2, Subalternative 2D would result in a greater visual impact (higher count of transmission structures) but a reduced potential to affect historic properties by ground disturbance (smaller footprint of temporary and permanent disturbance).

A total of 15.6 percent of the segments of Subalternative 2D have been investigated by Class III survey, while 61.4 percent of Segment p-11 (Alternative 2) has been previously investigated. Six NRHP-eligible sites are projected to occur within Subalternative 2D, and two NRHP-eligible cultural resource sites are projected to occur along the portion of Alternative 2 that Subalternative 2D would replace.

The data suggests that Subalternative 2D has a higher potential to affect historic properties than Alternative 2 based on projected site counts and the disturbance footprint.

Subalternative 2E
Compared to Alternative 2, Subalternative 2E would result in a reduced visual impact (lower count of transmission structures) and reduced potential to affect historic properties by ground disturbance (smaller footprint of temporary and permanent disturbance).

A total of 7.6 percent of the segments of Subalternative 2E have been investigated by Class III survey, while 14.1 percent of Segments p-16 and x-16 (Alternative 2) has been previously investigated. Fifty-three sites requiring NRHP evaluation are projected to occur within Subalternative 2E, and 42 are projected to occur along the portion of Alternative 2 that Subalternative 2E would replace.

While the data suggest that Subalternative 2E has a slightly higher potential to affect historic properties based on the disturbance footprint, projected site counts for both Subalternative 2E and Alternative 2 may be the result of low representative Class III survey samples.

4.6.8.4 Alternative 3: Avoidance Route

A total of 35 NRHP-eligible and NRHP-unevaluated cultural resources sites have been previously recorded within the 200-foot analysis corridor of Alternative 3. A total of 134 NRHP-eligible or NRHP-unevaluated cultural resources sites are projected to occur within the 200-foot analysis corridor of Alternative 3 (Tables 4.6-5, 4.6-6, 4.6-7, and 4.6-8). This high count of projected sites is likely inflated due to low representative Class III sample size, especially in Segments x-03, x-05, x-11, and ca-01, which have a combined sample size of less than 6.1 percent. Direct impacts due to construction could range between negligible (if NRHP-eligible sites could be avoided by Project design) and major (if eligible sites could not be avoided by Project design). Alternative 3 would impact fewer known cultural resource sites than the Proposed Action and Alternative 2 and Alternative 4, but more than Alternative 1.

Sensitive sites projected to occur in the 200-foot Alternative 3 analysis corridor include prehistoric trails. These site types have been recorded within one-half mile of Segments i-03, p-07, p-09, p-14, x-05, cb-01, cb-05, ca-09, and cb-10. The NRHP eligibility of all of these sites is not known at this time. If these trails and intaglios qualify as NRHP-eligible properties and exhibit a high degree of setting, feeling, and association, the construction of structures may create visual intrusions that affect the NRHP character-defining qualities of these sites. These potential effects would be assessed as part of the indirect effects analysis. The indirect effects analysis would occur after the execution of the PA and signing of the ROD. If effects to NRHP character-defining qualities are measurable, it would constitute a permanent cumulative effect.

Other indirect effects to historic properties could occur if Project roads enhance accessibility, potentially making previously inaccessible properties more vulnerable to increased visitation and vandalism.

Resolution Measures

Potential adverse effects to historic properties would be resolved in accordance with the provisions of the PA and specific HPTPs. Avoidance of historic properties by final design and construction would be the preferred adverse effect resolution measure. APM-CULT-01 and BMP-CULT-03 would be applicable to the resolution of potential adverse effect. For portions of the Project within the CDCA, adverse effect resolution measures as outlined in LUPA-CUL-4 would also be applicable.

Subalternatives to Alternative 3

Resolution measures for all of the subalternative routes would be the same as described for Alternative 3.

Subalternative 3A
Compared to Alternative 3, Subalternative 3A would result in a greater visual impact (higher count of transmission structures) and a greater potential to affect historic properties (greater footprint of temporary and permanent disturbance).

Only 5.0 percent of the segments of Subalternative 3A have been investigated by Class III survey, while 37.9 percent of Segments p-01 and i-01 (Alternative 3) has been previously investigated. Forty-one sites requiring NRHP evaluation are projected to occur within Subalternative 3A, while 38 NRHP-eligible site or sites requiring NRHP evaluation are projected to occur along the portion of Alternative 3 that Subalternative 3A would replace.

While the data suggests that Subalternative 3A has a higher potential to affect historic properties based on the disturbance footprint, projected site counts for Subalternative 3A may be the result of low representative Class III survey sample.

Subalternative 3B
Compared to Alternative 3, Subalternative 3B would result in a reduced visual impact (lower count of transmission structures) and less ground disturbance (smaller footprint of temporary and permanent disturbance).

Only 7.5 percent of the segments of Subalternative 3B have been investigated by Class III survey, while 12.7 percent of Segments p-02, p-03, p-04, x-03 (Alternative 3) has been previously investigated. A total of 19 NRHP-eligible or NRHP unevaluated cultural resources sites are projected to occur within Subalternative 3B, while 39 sites are projected to occur along the portion of Alternative 3 that Subalternative 3B would replace.

While the data suggest that Alternative 3 has a lower potential to affect historic properties based on the disturbance footprint, projected site counts for Subalternative 3B and Alternative 3 may be the result of low representative Class III survey sample.

Subalternative 3C
Compared to Alternative 3, Subalternative 3C would result in a comparable visual impact (comparable count of transmission structures) and a lower potential to affect historic properties by ground disturbance (smaller footprint of temporary and permanent disturbance).

A total of 5.9 percent of the segments of Subalternative 3C have been investigated by Class III survey, while only 3.6 percent of Segments i-03 and x-03 (Alternative 3) been previously investigated. Thirty-four NRHP-eligible sites or sites requiring NRHP evaluation are projected to occur within Subalternative 3C, while a total of 111 cultural resources sites requiring NRHP evaluation are projected to occur along the portion of Alternative 3 that Subalternative 3C would replace.

While the data suggest that Subalternative 3C has a lower potential to affect historic properties based on the disturbance footprint, projected site counts for both Subalternative 3C and Alternative 3 may be the result of low representative Class III survey samples.

Subalternative 3D
Compared to Alternative 3, Subalternative 3D would result in a greater visual impact (higher count of transmission structures) and a greater potential to affect historic properties by ground disturbance (greater footprint of temporary and permanent disturbance).

Only 2.0 percent of Subalternative 3D has been investigated by Class III survey, and only 2.0 percent of Segment i-04 (Alternative 3) has been previously investigated. A total of 102 NRHP-eligible sites are projected to occur within Subalternative 3D, and no cultural resources sites are projected to occur along the portion of Alternative 3 that Subalternative 3D would replace.

While the data suggest that Subalternative 3D has a higher potential to affect historic properties based on the disturbance footprint, projected site counts for both Subalternative 3C and Alternative 3 may be the result of low representative Class III survey samples.

Subalternative 3E
Compared to Alternative 3, Subalternative 3E would result in a comparable visual impact (comparable counts of transmission structures) but a greater potential to affect historic properties by ground disturbance (larger footprint of temporary and permanent disturbance).

A total of 29.0 percent of Subalternative 3E has been investigated by Class III survey, while only 2.4 percent of Segment x-05 (Alternative 3) has been previously investigated. A total of 21 cultural resources sites requiring NRHP evaluation are projected to occur within Subalternative 3E, while a total of 93 cultural resources sites are projected to occur along the portion of Alternative 3 that Subalternative 3E would replace.

While the data suggest that Subalternative 3E has a lower potential to affect historic properties based on the disturbance footprint, projected site counts for Subalternative 3E may be the result of low representative Class III survey sample. These effects must be also further evaluated in conjunction with the pairing of Subalternative 3E with Subalternatives 3D and 3G, or 3J.

Subalternative 3F
Compared to Alternative 3, Subalternative 3F would result in a comparable visual impact (comparable count of transmission structures) but less potential to affect historic properties by ground disturbance (smaller footprint of temporary and permanent disturbance).

A total of 23.7 percent of Subalternative 3F has been investigated by Class III survey, while only 23.7 percent of Segment x-06 (Alternative 3) has been previously investigated. A total of 21 NRHP-eligible or NRHP-unevaluated sites are projected to occur within Subalternative 3F, and 104 NRHP-eligible or NRHP-unevaluated sites are projected to occur along the portion of Alternative 3 that Subalternative 3F would replace.

The data suggest that Subalternative 3F and Alternative 3 would have a comparable potential to affect historic properties based on projected site counts and the disturbance footprint. These effects must also be further evaluated in conjunction with the pairing of Subalternative 3F with Subalternatives 3D and 3G, or 3J.

Subalternative 3G
Subalternative 3G consists of Segment qn-01. It does not replace a specific segment; for that reason, it is presented in terms of its standalone attributes. A total of 89.6 percent of Subalternative 3G has been investigated by Class III survey. Two NRHP-eligible sites or sites requiring NRHP evaluation are projected to occur within Subalternative 3G, which demonstrates a low sensitivity for cultural resources in the 200-foot analysis corridor.

The potential effect to historic properties by Subalternative 3G must be further evaluated in conjunction with the pairing of Subalternative 3G with Subalternatives 3D, 3E, 3F, 3H, and/or 3J.

Subalternative 3H
Subalternative 3H consists of Segment qn-02. It does not replace a specific segment; for that reason, it is presented in terms of its standalone attributes. A total of 56.6 percent of Subalternative 3H has been investigated by Class III survey. A total of seven NRHP-eligible cultural resources sites or sites requiring NRHP evaluation are projected to occur within Subalternative 3H.

The potential effect to historic properties by Subalternative 3H must be further evaluated in conjunction with the pairing of Subalternative 3H with Subalternatives 3D and 3L.

Subalternative 3J
Subalternative 3J consists of Segment i-05. It does not replace a specific segment; for that reason, it is presented in terms of its standalone attributes. A total of 36.3 percent of Subalternative 3J has

been investigated by Class III survey. A total of three cultural resources sites requiring NRHP evaluation are projected to occur within Subalternative 3J.

The potential effect to historic properties by Subalternative 3J must be further evaluated in conjunction with the pairing of Subalternative 3J with Subalternatives 3E, 3F, or 3G and 3H.

Subalternative 3K
Compared to Alternative 3, Subalternative 3K would result in a greater visual impact (higher count of transmission structures) but less potential to affect historic properties by ground disturbance smaller footprint of temporary and permanent disturbance).

A total of 44.8 percent of Subalternative 3K has been investigated by Class III survey, while 4.9 percent of Segment cb-01 (Alternative 3) has been previously investigated. No cultural resources sites are projected to occur within Subalternative 3K or along the portion of Alternative 3 that Subalternative 3K would replace.

The data suggest that Subalternative 3K and Alternative 3 would have a comparable potential to affect historic properties based on projected site counts and the disturbance footprint.

Subalternative 3L
Compared to Alternative 3, Subalternative 3L would result in a greater visual impact (higher count of transmission structures) and a greater potential to affect historic properties by ground disturbance (larger footprint of temporary and permanent disturbance).

A total of 45.5 percent of Subalternative 3L has been investigated by Class III survey, while 70.6 percent of Segments p-09, p-10, p-11 (Alternative 3) has been previously investigated. A total of 7 NRHP-eligible cultural resource sites are projected to occur within Subalternative 3L, and a total of 7 NRHP-eligible cultural resources sites are projected to occur along the portion of Alternative 3 that Subalternative 3L would replace.

The data suggests that Subalternative 3L has a higher potential to affect historic properties based on the projected site counts and disturbance footprint. However, effects must be further evaluated in conjunction with the pairing of Subalternative 3L with Subalternatives 3D and 3H or 3J, 3G, and 3H.

Subalternative 3M
Compared to Alternative 3, Subalternative 3M would result in a comparable visual impact (comparable count of transmission structures) but a greater potential to affect historic properties by ground disturbance (larger footprint of temporary and permanent disturbance).

A total of 27.0 percent of Subalternative 3M has been investigated by Class III survey, while 4.1 percent of Segments cb-10, x-11, ca-01 (Alternative 3) has been previously investigated. A total of 65 sites requiring NRHP evaluation are projected to occur within Subalternative 3M, and a total of 244 sites requiring NRHP evaluation are projected to occur along the portion of Alternative 3 that Subalternative 3M would replace. This inflated site count for Alternative 3 is the result of a low representative Class III survey sample in Segment ca-01.

While the data suggest that Alternative 3 has a higher potential to affect historic properties than Subalternative 3M based on projected site counts and the disturbance footprint, projected site counts for Alternative 3 may be the result of low representative Class III survey sample.

4.6.8.5 Alternative 4: Public Lands Emphasis Route

A total of 41 NRHP-eligible and NRHP-unevaluated cultural resources sites have been previously recorded within the 200-foot analysis corridor of Alternative 4. A total of 170 NRHP-eligible or NRHP-unevaluated cultural resources sites are projected to occur within the 200-foot analysis corridor of Alternative 4 (Tables 4.6-5, 4.6-6, 4.6-7, and 4.6-8). The projected count of sites may be influenced by skewed metrics resulting from lower Class III survey coverage (2 percent) of Alternative 4 Segment in-01. Direct impacts due to construction could range between negligible (if NRHP-eligible sites could be avoided by Project design) and major (if eligible sites could not be avoided by Project design). Alternative 4 would impact fewer cultural resource sites than the Proposed Action and Alternative 2; but more than Alternative 1 and Alternative 3.

Sensitive sites projected to occur in the 200-foot Alternative 4 analysis corridor include prehistoric trails. These site types have been recorded within one-half mile of Segments d-01, x-04, x-06, x-09, p-10, p-13, p-14, cb-02, cb-06, and ca-09. If these trails qualify as NRHP-eligible properties and exhibit a high degree of setting, feeling, and association, the construction of additional structures may create additional visual intrusions that affect their NRHP character-defining qualities. These potential effects would be assessed as part of the indirect effects analysis. The indirect effects analysis would occur after the execution of the PA and signing of the ROD. If effects to NRHP character-defining qualities are measurable this would constitute a permanent cumulative effect.

Indirect visual effects from the construction of Alternative 4 could occur for the following properties:

- The Limekiln Wash Intaglio, located within the 200-foot analysis corridor of Alternative 4 Segment p-13.
- The NRHP-listed Eagletail Petroglyph Site, located within the 5-mile indirect effects analysis area of Alternative 4 Segment d-01.
- The NRHP-listed Ripley Intaglio Site, located within the 5-mile indirect effects analysis area of Alternative 4 Segment p-15e.

Alternative 4 Segments p-13 and p-15e parallel the existing DPV1 transmission line. the construction of additional transmission structures may create additional visual intrusions on the Limekiln Wash and Ripley Intaglio Site NRHP qualities of integrity. These potential effects would be assessed as part of the indirect effects analysis. The indirect effects analysis would occur after the execution of the PA and signing of the ROD. If effects to NRHP qualities are measurable this would constitute a permanent cumulative effect.

The landscape of Alternative 4 Segment d-01 is largely native desert and the construction of structures would visually impact this area. Depending on the viewshed, the construction of structures may create visual intrusions that affect the NRHP character-defining qualities of the Eagletail Petroglyph Site. These potential effects would be assessed as part of the indirect effects analysis. The indirect effects analysis would occur after the execution of the PA and signing of the ROD. If effects to NRHP character-defining qualities of the Eagletail Petroglyph Site are measurable, it would constitute a permanent cumulative effect.

Other indirect effects to historic properties could occur if Project roads enhance accessibility, potentially making previously inaccessible properties more vulnerable to increased visitation and vandalism.

Resolution Measures

Potential adverse effects to historic properties would be resolved in accordance with the provisions of the PA and specific HPTPs. Avoidance of historic properties by final design and construction would be the preferred adverse effect resolution measure. APM-CULT-01 and BMP-CULT-03 would be applicable to the resolution of potential adverse effect. For portions of the Project within the CDCA, adverse effect resolution measures as outlined in LUPA-CUL-4 would also be applicable.

Subalternatives to Alternative 4

Resolution measures for all of the subalternative routes would be the same as described for Alternative 4.

Subalternative 4A
Compared to Alternative 4, Subalternative 4A would result in a greater visual impact (higher count of transmission structures) and a greater potential to impact historic properties by ground disturbance (larger footprint of temporary and permanent disturbance).

A total of 43.2 percent of Subalternative 4A has been investigated by Class III survey, while only 5.7 percent of Segment d-01 (Alternative 4) has been previously investigated. A total of 33 NRHP-eligible sites or sites requiring NRHP evaluation are projected to occur within Subalternative 4A, while 35 cultural resources sites requiring NRHP evaluation are projected to occur along the portion of Alternative 4 that Subalternative 4A would replace. In addition, one NRHP-listed property, the Eagletail Petroglyph Site, is located within the 5-mile indirect effects analysis area of Segment d-01.

While the data suggest that Subalternative 4A has a lower potential to affect historic properties based on the disturbance footprint, projected site counts for Alternative 4 may be the result of low representative Class III survey sample.

Subalternative 4B
Compared to Alternative 4, Subalternative 4B would result in a greater visual impact (higher count of transmission structures) and a greater potential to affect historic properties by ground disturbance (larger footprint of temporary and permanent disturbance).

Only 3.6 percent of Subalternative 4B has been investigated by Class III survey, and only 1.9 percent of Segment x-04 (Alternative 4) has been previously investigated. A total of 111 NRHP-eligible sites or sites requiring NRHP evaluation are projected to occur within Subalternative 4B, whereas no cultural resources sites requiring NRHP evaluation are projected to occur along the portion of Alternative 4 that Subalternative 4B would replace.

While the data suggest that Subalternative 4B has a higher potential to affect historic properties based on the disturbance footprint, projected site counts for Subalternative 4B and Alternative 4 may be the result of low representative Class III survey samples.

Subalternative 4C
Subalternative 4C consists of Segment i-04. It does not replace a specific segment; for that reason, it is presented in terms of its standalone attributes. A total of 2.0 percent of Subalternative 4C has been investigated by Class III survey. No cultural resources sites are projected to occur within Subalternative 4C. However, this projected site count must be viewed with caution in consideration of the small representative Class III sample size. The potential effect to affect historic properties by Subalternative 4C must be further evaluated in conjunction with the pairing of Subalternative 4C with Subalternatives 4D or 4J.

Subalternative 4D
Subalternative 4D would result in a comparable visual impact (comparable count of transmission structures) and a lower potential to affect historic properties by ground disturbance (greater footprint of temporary and permanent disturbance).

A total of 5.7 percent of Subalternative 4D has been investigated by Class III survey, and 26.7 percent of Segments i-05 and x-06 (Alternative 4) have been previously investigated. A total of 122 NRHP-eligible or NRHP-unevaluated sites are projected to occur within Subalternative 4D, whereas 22 NRHP-eligible or NRHP-unevaluated sites are projected to occur in the portion of Alternative 4 that Subalternative 4D would replace.

While the data suggests that Subalternative 4D has a higher potential to affect historic properties based on ground disturbance, the high projected site counts for Subalternative 4D are likely due to a low percentage of Class III survey. Any effects must be further evaluated in conjunction with the pairing of Alternative 4 with Subalternative 4C.

Subalternative 4E
Compared to Alternative 4, Subalternative 4E would result in the same visual impact (same count of transmission structures) and comparable potential to impact historic properties by ground disturbance (comparable footprint of temporary and permanent disturbance).

A total of 4.8 percent of Subalternative 4E has been investigated by Class III survey, while 44.8 percent of Segments p-10 and cb-02 (Alternative 4) has been previously investigated. No NRHP-eligible sites or sites requiring NRHP evaluation are projected to occur within Subalternative 4E. Two NRHP-eligible sites or sites requiring NRHP evaluation are projected to occur along the portion of Alternative 4 that Subalternative 4E would replace.

The data suggest that Subalternative 4E and Alternative 4 would have a comparable potential to affect historic properties based on projected site counts and the disturbance footprint.

Subalternative 4F
Compared to Alternative 4, Subalternative 4F would result in the same visual impact (same count of transmission structures) but a lower potential to impact historic properties by ground disturbance (smaller footprint of temporary and permanent disturbance).

A total of 8.7 percent of Subalternative 4F has been investigated by Class III survey, while 62.6 percent of Segments cb-06 and p-13 (Alternative 4) has been previously investigated. No NRHP-eligible sites or sites requiring NRHP evaluation are projected to occur within Subalternative 4F, whereas three cultural resources NRHP-eligible sites are projected to occur along the portion of Alternative 4 that Subalternative 4F would replace.

The data suggest that Subalternative 4F would have a lower potential to affect historic properties based on the disturbance footprint than Alternative 4. However, the null value of projected site counts for Subalternative 4F may be the result of low representative Class III survey sample.

Subalternative 4G
Compared to Alternative 4, Subalternative 4G would result in a comparable visual impact (comparable count of transmission structures) but a lower potential to affect historic properties by ground disturbance (smaller footprint of temporary and permanent disturbance).

A total of 43.7 percent of Subalternative 4F has been investigated by Class III survey, while 29.9 percent of Segments cb-02, cb-04, and cb-06 (Alternative 4) has been previously investigated. A total of two NRHP-eligible sites are projected to occur within Subalternative 4G, whereas a total of ten NRHP-eligible sites are projected to occur along the portion of Alternative 4 that Subalternative 4G would replace.

The data suggest that Subalternative 4G would have a lower potential to affect historic properties based on projected site counts and disturbance footprint than Alternative 4.

Subalternative 4H
Subalternative 4H consists of Segments x-08 and i-07. It does not replace a specific segment; for that reason, it is presented in terms of its standalone attributes. A total of 31.6 percent of Subalternative 4H has been investigated by Class III survey. A total of 12 NRHP-eligible cultural resources sites or sites requiring NRHP evaluation are projected to occur within Subalternative 4H. The potential effect to historic properties by Subalternative 4H must be further evaluated in conjunction with the pairing of Subalternative 4H with Subalternatives 4G and 4K.

Subalternative 4J
Subalternative 4J consists of Segment i-05. It does not replace a specific segment; for that reason, it is presented in terms of its standalone attributes. A total of 36.3 percent of Subalternative 4J has been investigated by Class III survey. A total of three cultural resources sites requiring NRHP evaluation are projected to occur within Subalternative 4J. The potential effect to historic properties by Subalternative 4J must be further evaluated in conjunction with the pairing of Subalternative 4J with Subalternative 4C.

Subalternative 4K
Subalternative 4K consists of Segments i-08s, ca-04, and x-09. It does not replace a specific segment; for that reason, it is presented in terms of its standalone attributes. A total of 30.3 percent of Subalternative 4K has been investigated by Class III survey. No cultural resources sites are projected to occur within Subalternative 4K. The potential effect to historic properties by Subalternative 4K must be further evaluated in conjunction with the pairing of Subalternative 4K with Subalternative 4H and 4N.

Subalternative 4L
Subalternative 4L consists of Segments cb-10 and x-11. It does not replace a specific segment; for that reason, it is presented in terms of its standalone attributes. A total of 7.5 percent of Subalternative 4L has been investigated by Class III survey. A total of 13 sites requiring NRHP evaluation are projected to occur within Subalternative 4L. However, this high projected site count is the result of low representative Class III survey sample in Segment x-11 of Subalternative 4L (1.5 percent). The potential effect to historic properties by Subalternative 4L must be further evaluated in conjunction with the pairing of Subalternative 4L with Subalternative 4M.

Subalternative 4M
Compared to Alternative 4, Subalternative 4M would result in a comparable visual impact (comparable count of transmission structures) and a comparable potential to disturb historic properties based on ground disturbance (comparable footprint of temporary and permanent disturbance).

A total of 2.0 percent of Subalternative 4M has been investigated by Class III survey, and 32.4 percent of Segment p-15w (Alternative 4) has been previously investigated. A total of 442 NRHP-unevaluated sites are projected to occur within Subalternative 4M, while 25 NRHP-eligible sites are projected to occur along Segment p-15w.

The data suggest that Subalternative 4M has a higher potential to effect historic properties based on ground disturbance; however, the high projected site counts for Subalternative 4M may be the result of low representative Class III survey sample. These effects must be also further evaluated in conjunction with the pairing of Subalternative 4M with Subalternative 4L.

Subalternative 4N
Subalternative 4N consists of Segment x-10. It does not replace a specific segment; for that reason, it is presented in terms of its standalone attributes. A total of 60.8 percent of Subalternative 4N has been investigated by Class III survey with negative results. No cultural resources sites are projected to occur within Subalternative 4N. The potential effect to historic properties by Subalternative 4N must be further evaluated in conjunction with the pairing of Subalternative 4N with Subalternatives 4H, 4K, and 4M.

Subalternative 4P
Compared to Alternative 4, Subalternative 4P would result in a higher visual impact (greater count of transmission structures), but a lower potential to affect historic properties by ground disturbance (smaller footprint of temporary and permanent disturbance).

A total of 60.4 percent of Subalternative 4P has been investigated by Class III survey, while 54.0 percent of Segments x-13, x-12, ca-06, ca-07, ca-09, and x-19 (Alternative 4) have been previously investigated. A total of 36 NRHP-eligible sites or sites requiring NRHP evaluation are projected to occur within Subalternative 4P, whereas 74 NRHP-eligible sites or sites requiring NRHP evaluation are projected to occur along the portion of Alternative 4 that Subalternative 4P would replace. Additionally, one NRHP-listed property, the Mule Tank Discontiguous Rock Art District, is within the 1-mile analysis area of Segment p-17 and would need to be evaluated to determine how the visual impacts affect the integrity of the setting and its NRHP status.

The data suggest that Subalternative 4P demonstrates a higher potential to affect historic properties than Alternative 4 segments it would replace. However, Segments p-17 and p- 18 of Subalternative 4P are further discussed in the Project's sensitivity analysis (Appendix 3B).

4.6.9 Residual Impacts

For historic properties that are determined eligible for the NRHP or listed on the NRHP under Criterion D, provided that the provisions of a HPTP for data recovery are followed, no residual impacts would occur. For those historic properties determined eligible for or listed on the NRHP under Criteria A, B, or C, impacts to their NRHP qualities of setting, feeling, and/or association may be considered to be residual. However, it is anticipated that these properties would at least partially retain the NRHP qualities that make them eligible under Criteria A, B, or C. As a result, the residual impact to these properties would be moderate.

4.6.10 CDCA Plan Compliance

CMAs LUPA-CUL-4, LUPA-TRANS-CUL-1 through LUPA-TRANS-CUL-6, and DFA-VPL-CUL-1 through DFA-VPL-CUL-7 would apply to the Project (Appendix 2C). DFA-VPL-CULT-7 would also apply to the Project (Appendix 2C) and would be satisfied by information provided in Sections 3.2.1.1 and 3.7.1.2, as well as Appendix 2D.

LUPA-CUL-4 is specific to the Project design to minimize impacts on cultural resources, including those places of elevated cultural or spiritual significance to Federally recognized tribes. Compliance with LUPA-CUL-4 would be satisfied with BMP-CULT-03, which states that the applicant would follow avoidance and stipulations outlined in the PA (Appendix 2D) and appropriate HPTPs, and APM-CULT-01 and APM-CULT-02 (Appendix 2A, Section 2A.6), in which the applicant commits to following those stipulations.

LUPA-TRANS-CUL-1 and DFA-VPL-CUL-1 are specific to the responsibility of the Project applicant to pay for costs associated with the Project's cultural resources compliance. Compliance with LUPA-TRANS-CUL-1 and DFA-VPL-CUL-1 would be satisfied by APM-CULT-01 and APM-CULT-02 (Appendix 2A, Section 2A.6), in which the applicant commits to conducting a cultural resources inventory of the direct and indirect APE, preparing HPTPs, and conducting cultural resource monitoring during Project construction, operations, maintenance, and decommissioning (as appropriate) to meet stipulations outlined in the PA (Appendix 2D).

LUPA-TRANS-CUL-2 and DFA-VPL-CUL-2 are specific to the applicant's payment of compensatory mitigation fees for cumulative and indirect effects to historic properties as a result of Project construction, operations, maintenance, and decommissioning. Compliance with LUPA-TRANS-CULT-2 and DFA-VPL-CUL-2 would be satisfied by BMP-CULT-05, which outlines the fee structure of the compensatory mitigation fee. The compensatory mitigation fee structure is also outlined in the stipulations contained within the PA (Appendix 2D).

LUPA-TRANS-CUL-3 and DFA-VPL-CUL-3 are specific to the applicant's payment of management fees as part of the compensatory mitigation fee contained in LUPA-TRANS-CUL-2 and DFA-VPL-CUL-2, respectively. Compliance with LUPA-TRANS-CUL-3 and DFA-VPL-CUL-3 would be satisfied by BMP-CULT- 05 (Appendix 2A, Section 2A.6), which outlines the fee structure of the management fee as part of the compensatory mitigation fee. The management fee and compensatory mitigation fee structure is also outlined in the stipulations contained within the PA (Appendix 2D).

LUPA-TRANS-CUL-4 and DFA-VPL-CUL-4 are specific to the development of a cultural resources sensitivity model based on existing cultural resources data in the CDCA Plan area for consideration in Project planning and alternative selection. Compliance with LUPA-TRANS-CUL-4 and DFA-VPL-CUL-4 would be satisfied with BMP-CUL-06 (Appendix 2A, Section 2A.6). This compliance measure has been met.

LUPA-TRANS-CUL-5 and DFA-VPL-CUL-5 are specific to the provision of a statistically significant cultural resources sample survey to be used in Project planning. Compliance with LUPA-TRANS-CUL-5 and DFA-VPL-CUL-5 would be satisfied by BMP-CULT-07 (Appendix 2A, Section 2A.6), which requires cultural resources Class III survey of Segments p-17 and p-18 to be conducted during the NEPA and CEQA analyses to meet the conditions of LUPA-TRANS-CUL-5 and DFA-VPL-CUL-5. This compliance measure has been met.

LUPA-TRANS-CUL-6 and DFA-VPL-CUL-6 are specific to the applicant's justification to include culturally sensitive areas through NEPA and CEQA analyses. Compliance with LUPA-TRANS-CUL-6 and DFA-VPL-CUL-6 would be satisfied by BMP-CULT-08 (Appendix 2A, Section 2A.6), which requires such justification from the Project applicant. This compliance measure has been met.

DFA-VPL-CUL-7 addresses completion of the Section 106 process. Compliance with DFA-VPL-CUL-7 is satisfied in Sections 3.6.1.1 and 3.7.1.2. Section 3.6.1.1 presents the regulatory requirement of the NHPA that includes Section 106. Section 5.2.2 summarizes the process of drafting the PA. Section 3.7.3.2 presents the efforts of tribal consultation with Indian tribes. Appendix 2D is the revised draft PA for the Project.

4.6.11 Unavoidable Adverse Effects

If historic properties cannot be avoided by Project design and construction, the disturbance, damage, or loss to that property as a result of ground disturbance is considered to be an unavoidable adverse effect.

4.6.12 Cumulative Effects

The Project Area is crossed by numerous utility and transportation corridors, including I-10, SR 78, SR 95, the CAP canal, the DPV1 transmission line, the El Paso Natural Gas Pipeline, as well as local roads (Tables 3.20-4b and 3.20-5). The landscape has been further altered by the development of the Town of Quartzsite and the City of Blythe, and the expansion of historic and modern agriculture. The scope of this development has resulted in the loss of historic properties by construction, as well as visual impacts to historic properties on the landscape. Large linear projects, such as DPV1, I-10, and the CAP canal have had the effect of altering the viewshed of the native landscape and disrupting the prehistoric trails and elements of traditional native infrastructure across the desert, all of which contribute to cumulative effects.

Reasonably foreseeable future actions include the development of large solar facilities in the western portion of the Project Area (Tables 3.20-5 and 4.6-9), all of which have the potential to cumulatively impact cultural resources. These cumulative effects are manifest in terms of the loss of historic properties due to ground disturbance associated with construction or operations and maintenance, and the changes to the viewshed of historic properties. Those historic properties considered to be especially sensitive to indirect effects are typically those for which integrity of setting, feeling, and association are contributors to the property's NRHP eligibility and its ability to convey a sense of its own significance. Cumulative effects to these properties by the introduction of new vertical elements would be assessed by the Project's indirect effects analysis. Increased visual degradation to properties that are eligible under NRHP Criteria A, B, and C, and that retain integrity of setting, feeling, and association, would result in permanent cumulative impacts.

The La Paz County Land Conveyance would remove 5,935 acres from Federal oversight. However, most of the land in the study area would remain under Federal jurisdiction and therefore be subject to protection afforded by cultural resource laws and evaluation of effects in accordance with NEPA. While the loss of cultural sites eliminates the potential to preserve the sites in place or to study the sites at a later time period when new evaluation techniques might exist, the impact to historic properties would be resolved through data recovery and other methods and would have the benefit of increasing scientific knowledge regarding the past lifeways of prehistoric, protohistoric, and historic populations in the region.

In the western Project Area, within the boundary of the CDCA, the BLM has addressed the reasonably foreseeable cumulative effect of construction and development on public lands through the development of the DRECP PA. This PA contains measures to address cumulative effects not addressed by data recovery or other traditional adverse effect resolution measures and provides for compensatory fees to address the cumulative loss of historic properties.

Table 4.6-9 Potential Disturbance in 5-Mile CEA from Reasonably Foreseeable Projects

ZONE	PROJECT	TYPE	ACRES
EP&K	Harquahala Solar Project	Solar Facility	3,514
EP&K	La Paz County land conveyance	Solar Facility	5,935
QTZ	Plomosa 9 Placer Claim	Mine	20
QTZ	Quartzsite Wastewater Treatment Plant Renovations	Infrastructure	16.7*
CB	West Port Gold	Mine	40
CR&CA	Blythe Energy Power Plant/Sonoran Energy Project	Power Plant	76
CR&CA	Blythe Mesa Solar Project	Solar Facility	7,025
CR&CA	Desert Quartzsite Solar	Solar Facility	4,800
CR&CA	Crimson Quartzsite Solar	Solar Facility	2,700
Total			24,110

* Expansion would be within the existing footprint and is therefore not included in total.

4.6.13 Irreversible and Irretrievable Commitment of Resources

Because cultural resources are non-renewable resources, any disturbance, damage, or loss to a resource that is or may be eligible for the NRHP would constitute an irreversible and irretrievable impact to that resource. However, archaeological data recovery of sites along the transmission line would increase knowledge and understanding about the history of southwestern Arizona and southeastern California, which would be a benefit (positive impact) to science. Data recovery along the Project would contribute to our understanding of prehistoric cultures, as well as to our understanding of historic era transportation, settlement, and mining. Investigations in these areas could help contribute our understanding and knowledge of the use and formation of the landscape in southwestern Arizona and southeastern California.

4.6.14 Relationship of Short-term Uses and Long-term Productivity

The short-term use of the ROW during construction of the Project would result in ground disturbance. If that ground disturbance results in the disturbance, damage, or loss of cultural resources that are or may be eligible for the NRHP, the long-term potential of that resource is reduced or eliminated. This is primarily true of resources eligible under Criterion D; however, if a resource eligible under Criterion A, B, or C is damaged or lost due to construction, that would also affect its long-term potential.

4.7 CONCERNS OF INDIAN TRIBES

4.7.1 Introduction

The Project is within ancestral lands of Indian tribes, and tribal communities have maintained a spiritual stewardship and cultural connection to the landscape. The natural and cultural resources within and near the Project Area contain cultural and spiritual energy for Indian tribes, and continue to play fundamental roles in cultural traditions, group identities, and ongoing religious and ceremonial traditions. Indian tribes with ancestral ties to the Project Area include:

- Agua Caliente Band of Cahuilla Indians
- Ak-Chin Indian Community[2]
- Augustine Band of Cahuilla Indians
- Cabazon Band of Mission Indians
- Chemehuevi Tribe of the Chemehuevi Indian Reservation
- Cocopah Indian Tribe of Arizona
- Colorado River Indian Tribes (CRIT)
- Fort McDowell Yavapai Nation
- Fort Mojave Tribe
- Fort Yuma Quechan Tribe
- Gila River Indian Community[1]
- Hopi Tribe of Arizona

[2] One of the Four Southern Tribes.

- Moapa Band of Paiute Indians
- Morongo Band of Mission Indians
- Salt River Pima-Maricopa Indian Community[1]
- San Manuel Band of Mission Indians
- Soboba Band of Luiseño Indians
- Tohono O'odham Nation
- Torres-Martinez Desert Cahuilla Indians
- Twenty-Nine Palms Band of Mission Indians
- Yavapai-Apache Nation of the Camp Verde Indian Reservation
- Yavapai-Prescott Indian Tribe
- Pueblo of Zuni

Discussion of the concerns of Indian tribes relevant to the Project including regulatory requirements, tribal land use and cultural affiliation, and areas of potential significance and sensitivity to Indian tribes are presented in Section 3.7. The status of consultation in accordance with Section 106 of the NHPA of 1966, as amended, is presented in Section 3.7.3.2.

4.7.2 Methods for Analysis

4.7.2.1 Analysis Area

The analysis area for the Project consists of areas where direct effects to places of Indian tribal concern may occur. Direct effects are defined by areas where ground disturbance would occur for Project construction, such as structure locations, access roads, lay down areas, and spur roads, among others. The analysis area is defined as a 200-foot-wide corridor where direct effects are expected to occur. Baseline data for the analysis area are presented in Section 3.6 and are considered to provide an appropriate measure for the analysis of potential direct effects of the Project. For Section 106 purposes, the APE for direct effects is defined differently (Appendix 2D).

In addition to direct impacts, indirect impacts to resources as a result of the Project may occur. Indirect impacts to resources include visual, atmospheric, and auditory effects. As tabulated and presented in Section 3.6, indirect atmospheric and auditory effects may occur in an area measuring 0.5-mile from each alternative or subalternative. Potential indirect visual effects were delineated to include resources within 5 miles on either side of the alternatives and subalternatives. In certain situations, the 5-mile visual analysis area was adjusted based on the presence of topography that restricts the viewshed. For Section 106 purposes, the APE for direct effects is defined differently (Appendix 2D).

4.7.2.2 Assumptions

The Project is an undertaking subject to the provisions of Section 106 of the NHPA of 1966, as amended. The BLM invited 23 Federally recognized tribes and California Native American tribes to participate in the Section 106 review of the Project based on information provided by the Yuma, Lake Havasu, Hassayampa, and Lower Sonoran field offices in Arizona, and the Palm Springs–South Coast field office in California. The BLM in Arizona also reviewed the consultation maps maintained by the Arizona SHPO in its government-to-government consultation toolkit (https://sites.google.com/view/az-consultation-toolkit/consultation-map), on which tribes have self-identified their areas of interest for agency consultation. The BLM's tribal relations policy consists of notification through letters and outreach, coordination through email, telephone, and conference calls, and formal government-to-government consultation between agency officials and tribal leaders in face-to-face meetings and field trips to project areas. In addition, the BLM has requested tribal input through the NEPA scoping process and workshops. Section 106 consultation is on-going. Section 106 consultation is discussed in Section 3.7.3.2. The purpose of BLM's Section 106 consultation and engagement with Indian tribes through the NEPA scoping process is to identify places of traditional and religious concern of Indian tribes that could be affected by an undertaking on BLM-administered land.

Based on the scope of the Project, the BLM has determined a PA developed in consultation with interested Indian tribes, land-managing and permitting agencies, and other consulting parties is required for the Project.

The PA would refine the direct and indirect APE based on design plans for the selected alternative. The Project's direct effects APE, defined as a corridor where the construction of Project elements such as structures, access and spur roads, and other ancillary elements would occur, would be intensively investigated at the Class III survey level (Section 3.6.1.6).

The PA and ROD would outline protocols for minimizing impacts to areas of concern to Indian tribes, such as options for regulating access, provisions for the inclusions of tribal members in cultural resources investigations and fieldwork, and the preparation of ethnographic studies, among other provisions, as required.

The following assumptions underlie the Section 106 consultation process:

- Indian tribes may choose not to divulge particularly sensitive information outside of the tribal community.
- Community members may have their own beliefs, which may not necessarily be shared by members of the tribal council.
- BLM can only address areas of concern to Indian tribes that are made known.
- Indian tribes may share new concerns during the Section 106 and NEPA process, and the BLM will attempt to address these in the PA.
- Some tribes may defer to other tribes in the decision-making process.

4.7.2.3 Environmental Effects Indicators, Magnitude, and Duration

The status of the BLM's Section 106 consultation process and scoping outreach is detailed in Section 3.7.3.2. To date, the BLM has invited affiliated Indian tribes to participate in the Section 106 consultation, established formal lines of communication for scheduled meetings and conference calls, held Section 106 and PA development meetings, and sponsored a tribal tour of Project alternatives. As a result of those communications, impact indicators have been developed specific to issues of tribal concern. These are not all inclusive, and other areas of concern to Indian tribes may be identified during continued Section 106 consultation.

Based on the result of Section 106 consultation and Project outreach, the following issues have been identified specific to issues of concern to Indian tribes:

- Existing Access: Tribal representatives from the CRIT, Fort Yuma Quechan Tribe, and the Twenty-Nine Palms Band of Mission Indians expressed concerns regarding construction of the Project limiting existing access into areas of tribal spiritual use, especially in the Mule Mountains. For example, DCRT may need to restrict non-Project personnel from entering the work area. While this may temporarily limit access, other access routes outside of the construction zone could continue to be used to accommodate entry to areas of spiritual use. If tribes communicate special occasions when access for religious ceremonies are planned, BLM can include provisions in the PA or the ROD that would limit construction activities in a particular area for short periods of time to accommodate the access (if an alternate route is not available).
- New Access: Tribal representatives from the CRIT, Fort Yuma Quechan Tribe, and the Twenty-Nine Palms Band of Mission Indians all expressed concerns regarding construction of the Project providing new access into sensitive areas that were previously inaccessible because of difficult entry. Tribal concerns were specific to increased OHV use that could lead to the vandalism and damage of cultural resources as a consequence of the Project. Effect resolution measures can be included in the PA and HPTPs.
- Native Infrastructure and Interconnection of the Cultural and Natural Environment: The CRIT, Fort Yuma Quechan Tribe, and Twenty-Nine Palms Band of Mission Indians expressed concerns regarding the interconnectedness of cultural resource sites, natural features of the landscape, and prehistoric trail networks. Concern was expressed regarding the cumulative effects of projects erasing the ancestral footprint of the tribes from the landscape. The direct and indirect effects of the Project on prehistoric properties and features of Native infrastructure (such as trails) are discussed throughout Section 4.6. Effect resolution measures can be included in the PA and HPTPs.
- Places of Elevated Spiritual Importance to Tribes: The CRIT, Fort Yuma Quechan Tribe, and Twenty-Nine Palms Band of Mission Indians all expressed concerns regarding specific culturally sensitive areas, especially in the Mule Mountains and the Palo Verde Mesa. Concern was expressed regarding visual impacts of Project infrastructure to areas of elevated spiritual importance, such as the Ripley Intaglio Site. The direct and indirect effects of the Project on known places of elevated spiritual importance to tribes are discussed throughout Section 4.6.

- The Colorado River: The CRIT, Fort Yuma Quechan Tribe, and Twenty-Nine Palms Band of Mission Indians all expressed concern about the influence of the Colorado River on their spiritual belief and cultural history. As such, the Colorado River crossing and the indirect and direct effects of its siting on the landscape and potential impact to cultural resources are of great concern to the Indian tribes. Effect resolution measures can be included in the PA and HPTPs.
- Treatment of Human Remains: The CRIT expressed concern regarding the treatment of human remains and mortuary items. It is their belief that if human remains are encountered, they should not be removed but avoided entirely and left in place.
- Intrusion on Pristine Landscapes: The CRIT, Fort Yuma Quechan Tribe, and Twenty-Nine Palms Band of Mission Indians all expressed desire to restrict Project disturbance to areas already disturbed in order to limit impacts to pristine landscapes. Pristine and undisturbed landscapes are important to tribal spiritual life and are high-energy places that should be preserved.

The following are impact indicators identified specific to these issues of concern to Indian tribes:

- Project-related changes that would restrict Indian tribal access into traditional use areas and areas of elevated spiritual significance.
- Project-related changes that result in new access into areas where access had previously been limited. This would be the result of new access roads that would open up areas to OHV traffic and could result in vandalism of cultural resources.
- Project ground disturbance that results in the loss or destruction of prehistoric properties and erases the connection between individual sites and natural features of the landscape. Specific information regarding potential effects to prehistoric historic properties are discussed in Section 4.6.
- Project-related changes that modify visual aspects of areas of elevated spiritual importance.
- Project-related changes that would modify visual aspects of the Colorado River.
- Project-related changes resulting in new disturbance in pristine environments that would affect the spiritual energy of a natural landscape.

Non-NRHP eligible cultural resources may be of importance to the tribes and must be considered when assessing impacts to Indian tribes. Impact magnitude and duration definitions specific to concerns to Indian tribes are defined in Table 4.7-1.

Table 4.7-1 Impacts of Concern to Indian Tribes: Magnitude and Duration Definitions

ATTRIBUTE OF IMPACT		DESCRIPTION SPECIFIC TO INDIAN CONCERNS
Magnitude	No impact	There would be no change to the current condition of areas of concern to Indian tribes as a result of Project construction, operation, maintenance, or decommissioning. There would be no effect to the existing access of specific areas; prehistoric or ethnohistoric cultural resources, areas of elevated spiritual importance,or the Colorado River; human remains; or pristine qualities of existing undeveloped landscapes.
	Negligible	There would be no measurable change to the current condition of areas of concern to Indian tribes as a result of Project construction, operation, maintenance, and decommissioning. While a change to the existing access of specific areas may occur, it would not affectthat access. Prehistoric or ethnohistoric cultural resources, areas of elevated spiritual concern and the Colorado River would not be affected to a measurable degree. There would be no measurable change to the pristine qualities of existing undeveloped landscapes.
	Minor	There would be a small, but measurable, change to the current condition of areas of concern to Indian tribes as a result of Project construction, operation, maintenance, and decommissioning. While a small change to the existing access of specific areas may occur, it would not negatively affect that access. While prehistoric or ethnohistoric cultural resources, areas of elevated spiritual concern, the Colorado River, and pristine qualities of existing undeveloped landscapes would be affected, it would not negatively affect those areas of concern.
	Moderate	An easily discernable and measurable change to the current condition of areas of concern to Indian tribes as a result of Project construction, operation, maintenance, and decommissioning would occur. Changes to existing access would occur that would require a general effect resolution measure to minimize impacts. Prehistoric or ethnohistoric cultural resources, areas of elevated spiritual importance, the Colorado River, and the pristine qualities of existing undeveloped landscapes would be affected to a measurable degree.
	Major	A large, easily measurable change in condition to areas of concern to Indian tribes would occur as a result of Project construction, operation, maintenance, and decommissioning. Changes to existing access would occur that would require specific resolution measures to minimize impacts. Prehistoric or ethnohistoric cultural resources, areas of elevated spiritual importance, the Colorado River, and the pristine qualities of existing desert landscapes would be substantially altered. Human remains would be encountered by the Project.
Duration	Temporary	Limited to active construction or maintenance.
	Short term	During construction (1.5–2 years), up to 10 years.
	Long term	More than 10 years.

4.7.3 No Action Alternative

Under the No Action Alternative, no ROW would be granted for the Project and the transmission line, SCS, and ancillary facilities would not be constructed.

The Project Area would not be affected by Project-related ground disturbance, and no effect to traditional native infrastructure and the interconnected natural landscape would occur. There would be no change to existing access, and new access would not be implemented. Project-related support structures and other facilities would not be constructed, so the Colorado River, pristine areas, and areas of elevated spiritual importance to tribes would not be affected. Changes in the environment would be limited to ongoing current actions or from disturbance associated with new actions unrelated to the Project.

4.7.4 Construction of Action Alternative Segments

4.7.4.1 Direct and Indirect Effects Common to All Action Alternatives

<u>Direct Effects</u>

Ground disturbance during construction is expected with the Proposed Action and all Action Alternatives and may affect areas of tribal concern. The magnitude and duration of any potential effect would vary depending on the type of disturbance and the area of tribal concern affected. The primary contributor of permanent ground disturbance would be related to structure and SCS construction as well as the construction of/improvements to access and spur roads. Temporary disturbance during Project construction may also have direct effects to areas of tribal concern. The effects of construction on areas of specific tribal concern are:

- Limitations to tribal access;
- Effects on traditional native infrastructure and the interconnected cultural and natural environment (i.e., traditional cultural landscape);
- New development in areas that are predominantly pristine;
- The location of the crossing of the Colorado River;
- Effects on areas of elevated spiritual importance; and
- Discovery and treatment of human remains.

Impacts to cultural resource sites would be the same as discussed in section 4.5. Should a tribal cultural landscape be identified during additional study, impacts to the landscape would be evaluated. Measures to resolve potential adverse effects to areas of tribal concern as a result of Project construction would be contained in the PA (Appendix 2D), HPTP, and the Tribal Participation Plan. Avoidance of impacts by final design and construction would be the preferred adverse effect resolution measure.

<u>Indirect Effects</u>

Indirect effects to cultural resources and areas of tribal concern could occur in areas where the construction of new roads into the Project Area would provide improved access into previously inaccessible areas. Improved access could lead to site damage by OHV and recreational use of these areas. Such damage could consist of vehicular damage to surface archaeological sites, and vandalism to sensitive areas. However, the number and types of historic properties affected would vary by segment and alternative and would be assessed in detail when an alternative is selected. Effect resolution measures to minimize or resolve potential adverse effects to cultural resources and areas of tribal concern as a result of improved access would be included in the PA, ROD, and Project APMs and BMPs.

Indirect impacts would occur from the presence of structures in sight of areas of tribal concern by altering their setting, feeling, and association. However, the number and types of cultural resources affected would vary by segment and alternative and would be assessed in detail when an alternative is selected. Effect resolution measures to minimize the potential adverse effects of visual intrusions would be contained in the project-specific PA, ROD, Project APMs and BMPs, and implemented by Project design.

Petroglyphs and intaglios are often areas of elevated spiritual importance to Indian tribes and are considered to be sensitive to indirect visual effects. Trails are of significance to Indian tribes as part of traditional native infrastructure associated with the interconnectedness of the cultural and natural environment, and also considered to be sensitive to indirect visual effects. To the extent that a site or prehistoric feature exhibits a high degree of integrity of setting, feeling, and association, the Project could affect its character-defining qualities. These potential effects would be assessed as part of the more detailed indirect effects analysis after BLM selects either a specific action alternative or discontinues further study by selecting the no action alternative. With selection of an action alternative, if effects to prehistoric or ethnohistoric cultural resource character-defining qualities are measurable beyond a small change, this would constitute a moderate to major long-term effect. While the features identified as concerns of Indian tribes are described in the segment and full route alternative analysis, the nature of the effects are common to all (unless specified in the detailed effects analysis) and are not repeated in the segment analysis or full route alternative analysis.

4.7.4.2 East Plains and Kofa Zone

Direct and Indirect Effects Common to All Segments in the Zone

See the discussion of direct and indirect effects common to all Action Alternatives (Section 4.7.4.1).

Direct and Indirect Segment-specific Effects

Potential effects to cultural resource sites by segment are discussed in Section 4.6, including a discussion of impacts, magnitude, and duration. Direct and indirect segment-specific effects to areas of concern to Indian tribes in the East Plains and Kofa Zone are contained in Table 4.7-2. This table summarizes information itemized in the cultural resources assessments of each segment (Section 4.6) and known tribal concerns (Section 3.7). Consultation and coordination with tribes is ongoing, therefore additional areas of concern to Indian tribes may be identified in the future.

Table 4.7-2 Direct and Indirect Segment-Specific Effects to Areas of Concern to Indian Tribes in the East Plains and Kofa Zone

SEGMENT NO.	EXISTING ACCESS	NEW ACCESS	NATIVE INFRASTRUCTURE AND INTERCONNECTEDNESS OF THE CULTURAL AND NATURAL ENVIRONMENT	PLACES OF ELEVATED SPIRITUAL IMPORTANCE	COLORADO RIVER	TREATMENT OF HUMAN REMAINS	INTRUSION ON PRISTINE LANDSCAPES
PROPOSED ACTION							
p-01							
p-02							
p-03							
p-04			X				
p-05							
p-06			X	X			
ALTERNATIVE 1							
p-01							
i-01							
i-02							
i-03			X				
i-04							
ALTERNATIVE 1, SUBALTERNATIVE 1A							
p-02							
p-03							
x-02a			X				
x-02b			X				

SEGMENT NO.	EXISTING ACCESS	NEW ACCESS	NATIVE INFRASTRUCTURE AND INTERCONNECTEDNESS OF THE CULTURAL AND NATURAL ENVIRONMENT	PLACES OF ELEVATED SPIRITUAL IMPORTANCE	COLORADO RIVER	TREATMENT OF HUMAN REMAINS	INTRUSION ON PRISTINE LANDSCAPES
ALTERNATIVE 1, SUBALTERNATIVE 1B							
p-02							
x-01							
x-02a			X				
ALTERNATIVE 1, SUBALTERNATIVE 1C							
in-01							
ALTERNATIVE 2							
i-01							
i-02							
i-03			X				
i-04							
p-01							
ALTERNATIVE 2, SUBALTERNATIVE 2A							
d-01			X	X			
x-02a			X				
x-02b			X				
ALTERNATIVE 2, SUBALTERNATIVE 2B							
p-02							
p-03							
p-04			X				

SEGMENT NO.	EXISTING ACCESS	NEW ACCESS	NATIVE INFRASTRUCTURE AND INTERCONNECTEDNESS OF THE CULTURAL AND NATURAL ENVIRONMENT	PLACES OF ELEVATED SPIRITUAL IMPORTANCE	COLORADO RIVER	TREATMENT OF HUMAN REMAINS	INTRUSION ON PRISTINE LANDSCAPES
x-03							
ALTERNATIVE 3							
i-03			X				
i-04							
p-01							
p-02							
p-03							
p-04			X				
x-03							
ALTERNATIVE 3, SUBALTERNATIVE 3A							
d-01			X	X			
x-02a			X				
x-02b			X				
i-02							
ALTERNATIVE 3, SUBALTERNATIVE 3B							
i-01							
i-02							
ALTERNATIVE 3, SUBALTERNATIVE 3C							
p-05							
x-04			X				X

SEGMENT NO.	EXISTING ACCESS	NEW ACCESS	NATIVE INFRASTRUCTURE AND INTERCONNECTEDNESS OF THE CULTURAL AND NATURAL ENVIRONMENT	PLACES OF ELEVATED SPIRITUAL IMPORTANCE	COLORADO RIVER	TREATMENT OF HUMAN REMAINS	INTRUSION ON PRISTINE LANDSCAPES
ALTERNATIVE 3, SUBALTERNATIVE 3D							
in-01							
ALTERNATIVE 4							
d-01			X	X			
in-01							
p-04			X				
p-05							
x-04			X				X
ALTERNATIVE 4, SUBALTERNATIVE 4A							
p-01							
p-02							
p-03							
ALTERNATIVE 4, SUBALTERNATIVE 4B							
x-03							
i-03			X				
ALTERNATIVE 4, SUBALTERNATIVE 4C							
i-04							

With the exception of Segment x-04, the East Plains and Kofa Zone Alternative segments cross through areas largely disturbed by prior actions, including existing utilities such as transmission lines, the I-10 corridor, agricultural areas, and the CAP canal. Existing access could be utilized through much of this area, thus minimizing new access. The proximity of new transmission line structures near existing utilities and transportation corridors would not eliminate the visual effect but may create additional intrusions that would need to be assessed as part of an indirect effects analysis of any Alternative that may be selected. Segment x-04 crosses through an area of largely undisturbed desert where new access and new visual intrusions would be introduced. As a result, potential impacts of tribal concerns could occur and would require a more detailed assessment by an indirect effects analysis in consideration of Project design details. If these effects are measurable beyond a small change, they would constitute a moderate to major long-term effect.

One cultural resource site potentially sensitive to indirect visual impacts, the Eagletail Petroglyph Site, is located in the 5-mile indirect effects analysis area of Segment d-01 in the Eagletail Mountains. An additional site, the Indian Well Site (AZ-050-1445), consists of two groups of petroglyphs near a spring or seep. It is located within the 1-mile analysis corridor of Segment p-06.

Previously recorded cultural resources sites that contain prehistoric trail segments are located on Segments p-04, p-06, d-01, i-03, x-02, and x-04.

4.7.4.3 Quartzite Zone

Direct and Indirect Effects Common to All Segments in the Zone

See the discussion of direct and indirect effects common to all Alternative segments (Section 4.7.4.1).

Direct and Indirect Segment-specific Effects

Potential effects to cultural resource sites by segment are discussed in Section 4.6, including a discussion of impacts, magnitude, and duration. Direct and indirect segment-specific effects to areas of concern to Indian tribes in the Quartzsite Zone are contained in Table 4.7-3.

With the exception of Segment x-05, the Quartzsite Zone Alternative segments cross through areas largely disturbed by prior actions, including existing utilities such as transmission lines, the I-10 corridor, agricultural areas, residential and commercial development associated with the Town of Quartzsite, LTVA, and local/regional transportation corridors. Existing access could be utilized through much of this area, thus minimizing new access. The proximity of new transmission line structures near existing development would not eliminate the visual effect on resources sensitive to visual change, but may create additional intrusions that would need to be assessed on a case-by-case basis as part of an indirect effects analysis.

Segment x-05 crosses through an area of largely undisturbed desert where new access and new visual intrusions would be introduced. As a result, potential impacts could occur to tribal concerns regarding new access and intrusion on pristine landscapes and would require assessment by an indirect effects analysis. If effects are measurable beyond a small change, they would constitute a moderate to major long-term effect.

Table 4.7-3 Direct and Indirect Segment-Specific Effects to Areas of Concern to Indian Tribes in the Quartzsite Zone

SEGMENT NO.	EXISTING ACCESS	NEW ACCESS	NATIVE INFRASTRUCTURE AND THE INTERCONNECTEDNESS OF THE LANDSCAPE	PLACES OF ELEVATED SPIRITUAL IMPORTANCE	COLORADO RIVER	TREATMENT OF HUMAN REMAINS	INTRUSION ON PRISTINE LANDSCAPES
PROPOSED ACTION							
p-07			X				
p-08							
ALTERNATIVE 1							
i-05							
qs-01			X				
qs-02				X			
ALTERNATIVE 1, SUBALTERNATIVE 1D							
qn-01							
ALTERNATIVE 2							
i-05							
qs-01			X				
x-07			X				
ALTERNATIVE 3							
p-07			X				
p-08							
x-05			X				X
ALTERNATIVE 3, SUBALTERNATIVE 3E							
qs-01			X				
x-07			X				

SEGMENT NO.	EXISTING ACCESS	NEW ACCESS	NATIVE INFRASTRUCTURE AND THE INTERCONNECTEDNESS OF THE LANDSCAPE	PLACES OF ELEVATED SPIRITUAL IMPORTANCE	COLORADO RIVER	TREATMENT OF HUMAN REMAINS	INTRUSION ON PRISTINE LANDSCAPES
ALTERNATIVE 3, SUBALTERNATIVE 3F							
x-06			X				
ALTERNATIVE 3, SUBALTERNATIVE 3G							
qn-01							
ALTERNATIVE 3, SUBALTERNATIVE 3H							
qn-02			X	X			
ALTERNATIVE 3, SUBALTERNATIVE 3J							
i-05							
ALTERNATIVE 4							
p-08							
qn-01							
x-06			X				
ALTERNATIVE 4, SUBALTERNATIVE 4D							
x-05			X				X
p-07			X				
ALTERNATIVE 4, SUBALTERNATIVE 4J							
i-05							

One site located within the 1-mile analysis corridor of Segment qn-02 contains an intaglio. An additional site located within the 1-mile analysis corridor of Segment qs-02 contains an intaglio and prehistoric and historic petroglyphs. Previously recorded cultural resources sites that contain prehistoric trail segments are located on Segments p-07, qn-02, qs-01, x-05, x-06, and x-07.

4.7.4.4 Copper Bottom Zone

Direct and Indirect Effects Common to All Segments in the Zone

See the discussion of direct and indirect effects common to all Alternative segments (Section 4.7.4.1).

Direct and Indirect Segment-specific Effects

Potential effects to cultural resource sites by segment are discussed in Section 4.6, including a discussion of impacts, magnitude, and duration. Direct and indirect segment-specific effects to areas of concern to Indian tribes in the Copper Bottom Pass Zone are contained in Table 4.7-4.

With the exception of Segments cb-01, cb-02, and cb-04, the Copper Bottom Zone segments cross through areas largely disturbed by prior actions, including existing utilities such as transmission lines, local/regional transportation corridors, and the I-10 corridor. Existing access could be utilized through much of this area, thus minimizing new access. The proximity of new transmission line structures near existing transmission lines would not eliminate the visual effect on resource sensitive to visual change, but may create additional intrusions that would need to be assessed on a case-by-case basis as part of an indirect effects analysis.

Segments cb-01, cb-02, and cb-04 cross through areas of largely undisturbed desert where new access and new visual intrusions would be introduced. As a result, potential impacts could occur to tribal concerns regarding new access and intrusion on pristine landscapes and would require assessment by an indirect effects analysis. If effects are measurable beyond a small change, they would constitute a moderate to major long-term effect.

One site located within the 1-mile corridor of Segment i-07 contains an intaglio. In addition, petroglyph sites are located within the 1-mile corridor of Segment i-06, and Segment p-13 contains an intaglio within the 200-foot analysis corridor

Previously recorded cultural resources sites that contain prehistoric trail segments are located on Segments p-09, p-10, p-11, p-12, p-13, p-14, p-15e, cb-01, cb-02, cb-03, cb-05, cb-06, cb-10, i-07, and x-08.

Table 4.7-4 Direct and Indirect Segment-Specific Effects to Areas of Concern to Indian Tribes in the Copper Bottom Pass Zone

SEGMENT NO.	EXISTING ACCESS	NEW ACCESS	NATIVE INFRASTRUCTURE AND THE INTERCONNECTEDNESS OF THE LANDSCAPE	PLACES OF ELEVATED SPIRITUAL IMPORTANCE	COLORADO RIVER	TREATMENT OF HUMAN REMAINS	INTRUSION ON PRISTINE LANDSCAPES
PROPOSED ACTION							
p-09			X				
p-10			X				
p-11			X				
p-12			X				
p-13			X	X			
p-14			X				
ALTERNATIVE 1							
i-06				X			
i-07			X	X			
ALTERNATIVE 2							
p-09			X				
p-10			X				
p-11			X				
p-12			X				
p-13			X	X			
p-14			X				

SEGMENT NO.	EXISTING ACCESS	NEW ACCESS	NATIVE INFRASTRUCTURE AND THE INTERCONNECTEDNESS OF THE LANDSCAPE	PLACES OF ELEVATED SPIRITUAL IMPORTANCE	COLORADO RIVER	TREATMENT OF HUMAN REMAINS	INTRUSION ON PRISTINE LANDSCAPES
ALTERNATIVE 2, SUBALTERNATIVE 2C							
cb-02			X				X
cb-04							X
cb-06			X				
ALTERNATIVE 2, SUBALTERNATIVE 2D							
cb-03			X				
ALTERNATIVE 3							
p-09			X				
p-14			X				
cb-01			X				X
cb-04							X
cb-05			X				
ALTERNATIVE 3, SUBALTERNATIVE 3K							
p-10			X				
cb-02			X				X
ALTERNATIVE 3, SUBALTERNATIVE 3L							
i-06				X			
x-08			X				
p-12			X				
p-13			X	X			

SEGMENT NO.	EXISTING ACCESS	NEW ACCESS	NATIVE INFRASTRUCTURE AND THE INTERCONNECTEDNESS OF THE LANDSCAPE	PLACES OF ELEVATED SPIRITUAL IMPORTANCE	COLORADO RIVER	TREATMENT OF HUMAN REMAINS	INTRUSION ON PRISTINE LANDSCAPES
ALTERNATIVE 4							
p-09			X				
p-10			X				
p-13			X	X			
p-14			X				
cb-02			X				X
cb-04							X
cb-06			X				
ALTERNATIVE 4, SUBALTERNATIVE 4E							
cb-01			X				X
ALTERNATIVE 4, SUBALTERNATIVE 4F							
cb-05			X				
ALTERNATIVE 4, SUBALTERNATIVE 4G							
p-11			X				
p-12			X				
ALTERNATIVE 4, SUBALTERNATIVE 4H							
x-08			X				
i-07			X	X			

4.7.4.5 Colorado River and California Zone

<u>Direct and Indirect Effects Common to All Segments in the Zone</u>

See the discussion of direct and indirect effects common to all Alternative segments (Section 4.7.4.1).

<u>Direct and Indirect Segment-specific Effects</u>

Potential effects to cultural resource sites by segment are discussed in Section 4.6, including a discussion of impacts, magnitude, and duration. Direct and indirect segment-specific effects to areas of concern to Indian tribes in the Colorado River and California Zone are contained in Table 4.7-5.

Segments in the Colorado River and California Zone cross through areas largely disturbed by prior actions, including existing utilities such as transmission lines, the I-10 corridor, agricultural areas, and residential and commercial development associated with the City of Blythe, and local/regional transportation corridors. Existing access could be utilized through much of this area, thus minimizing new access. The proximity of new transmission line structures near existing development would not eliminate the visual effect on resources sensitive to visual change, but may create additional intrusions that would need to be assessed as part of an indirect effects analysis.

Segments p-17 and p-18 are of elevated tribal concern in terms of new and existing access, and areas of elevated spiritual importance. Segment p-17 additionally contains cremated bone consistent with a human cremation. Segments p-17 and p-18 are further discussed in the Project's sensitivity analysis (Appendix 3B). The resources along these segments are considered by the tribes to be sensitive to both direct effects and indirect visual effects. These effects would require assessment by an indirect effects analysis. If effects are measurable beyond a small change, they would constitute a moderate to major long-term effect.

One archaeological district containing petroglyphs and intaglios (the Mule Tank Discontiguous Rock Art District) is located within the 1-mile analysis corridor of Segments p-17 and p-18. One site, the Ripley Intaglio Site, is located within the 5-mile indirect effects analysis area of Segment p-15e. Potential visual effects to this site have been expressed by the Quechan Tribe. In addition, petroglyph sites are located along Segment i-08s.

Previously recorded cultural resources sites that contain prehistoric trail segments are located on Segments ca-02, i-08s, x-15, and x-16. Additional trails are known to be present throughout the Colorado River and California Zone, and were utilized by the Mohave people and others. Major trails include the Coco-Maricopa Trail and the Salt Song Trail.

While the Salt Song Trail is metaphysical, and is not physically present on the landscape, consultation received from the Twenty-Nine Palms Band notes that locations named in the Salt Songs may be tied to physical locations of importance in or around the Project (Madrigal [Twenty-Nine Palms Band of Mission Indians] to MacDonald [BLM], 5/12/2017).

Table 4.7-5 Direct and Indirect Segment-Specific Effects to Areas of Concern to Indian Tribes in the Colorado River and California Zone

SEGMENT NO.	EXISTING ACCESS	NEW ACCESS	NATIVE INFRASTRUCTURE AND THE INTERCONNECTEDNESS OF THE LANDSCAPE	PLACES OF ELEVATED SPIRITUAL IMPORTANCE	COLORADO RIVER	TREATMENT OF HUMAN REMAINS	INTRUSION ON PRISTINE LANDSCAPES
PROPOSED ACTION							
p-15e			X	X	X		
p-15w							
p-16							
p-17				X		X	
p-18				X			
ALTERNATIVE 1							
i-08s			X	X			
ca-04					X		
ca-05							
ca-06							
ca-07							
ca-09							
x-09							
x-19							

SEGMENT NO.	EXISTING ACCESS	NEW ACCESS	NATIVE INFRASTRUCTURE AND THE INTERCONNECTEDNESS OF THE LANDSCAPE	PLACES OF ELEVATED SPIRITUAL IMPORTANCE	COLORADO RIVER	TREATMENT OF HUMAN REMAINS	INTRUSION ON PRISTINE LANDSCAPES
ALTERNATIVE 1, SUBALTERNATIVE 1E							
ca-01							
x-10							
x-12							
ALTERNATIVE 2							
p-15e			X	X	X		
p-15w							
p-16			X				
x-15			X				
x-16			X				
ca-07							
ca-09							
x-19							
ALTERNATIVE 2, SUBALTERNATIVE 2E							
x-13							
ca-02			X				
ALTERNATIVE 3							
ca-01							
ca-06							
ca-07							

SEGMENT NO.	EXISTING ACCESS	NEW ACCESS	NATIVE INFRASTRUCTURE AND THE INTERCONNECTEDNESS OF THE LANDSCAPE	PLACES OF ELEVATED SPIRITUAL IMPORTANCE	COLORADO RIVER	TREATMENT OF HUMAN REMAINS	INTRUSION ON PRISTINE LANDSCAPES
ca-09							
cb-10			X		X		
x-11							
x-12							
x-19							
ALTERNATIVE 3, SUBALTERNATIVE 3M							
p-15e			X	X	X		
p-15w							
x-13							
ALTERNATIVE 4							
p-15e			X	X	X		
p-15w							
ca-06							
ca-07							
ca-09							
x-12							
x-13							
x-19							

SEGMENT NO.	EXISTING ACCESS	NEW ACCESS	NATIVE INFRASTRUCTURE AND THE INTERCONNECTEDNESS OF THE LANDSCAPE	PLACES OF ELEVATED SPIRITUAL IMPORTANCE	COLORADO RIVER	TREATMENT OF HUMAN REMAINS	INTRUSION ON PRISTINE LANDSCAPES
ALTERNATIVE 4, SUBALTERNATIVE 4K							
i-08s			X	X			
ca-04							
x-09							
ALTERNATIVE 4, SUBALTERNATIVE 4L							
cb-10			X		X		
x-11							
ALTERNATIVE 4, SUBALTERNATIVE 4M							
ca-01							
ALTERNATIVE 4, SUBALTERNATIVE 4N							
x-10							
ALTERNATIVE 4, SUBALTERNATIVE 4P							
p-16							
p-17							
p-18							

Segments cb-10, ca-04, and p-15e cross the Colorado River. The CRIT, Quechan Tribe of the Fort Yuma Indian Reservation, and Twenty-Nine Palms Band of Mission Indians all expressed concern about the Colorado River, and its influence on their spiritual belief and cultural history. As such, the Colorado River crossing and the indirect and direct effects of its siting on the landscape and potential impact to cultural resources are of great concern to the Indian tribes and should be addressed by an indirect effects analysis and continued government-to-government Section 106 consultation.

4.7.5 Operations, Maintenance, and Decommissioning

The anticipated operations and maintenance duration is 50 years. Though most impacts to historic properties are expected to occur in association with construction, continuing Project-related activities and Project effects to areas of tribal concern would continue after construction, including periodic access and occasional ground disturbance as described in Section 2.2.8.

These maintenance and operating activities would have the potential to affect tribal concern if they take place in culturally sensitive areas by restricting access, or when scheduled at times of years that are spiritually significant to Indian tribes. Such activities should be scheduled in communication with the Indian tribes as to not interfere with tribal ceremonial functions or restrict access to places of tribal importance. These measures should be addressed in the PA or the ROD.

Ground disturbance associated with operation and maintenance activities may have the potential to affect areas of tribal concern if they take place in sensitive areas. These activities are discussed in Section 4.6.5, and should be addressed in the PA.

In addition, Project operation and maintenance may result in the maintenance of access roads established during construction that provide the opportunity for continued access into areas that were previously inaccessible and/or used only intermittently. The maintenance of an expanded road network that could accommodate increased access should be regularly assessed to ensure that no unanticipated adverse effects or vandalism of sensitive cultural resources occur.

Given the length of time of the Project's use life and decommissioning, decommissioning would require further analysis in the future. It is anticipated that decommissioning activities would be addressed by future Section 106 and CEQA analyses.

4.7.6 Resolution Measures for the Resolution of Adverse Effects

Resolution measures for adverse effects to cultural resources and areas of concern to Indian tribes would be outlined in the PA and HPTPs developed for the treatment of adverse effects to specific historic properties (APM-CULT-01, APM-CULT-03; Appendix 2A, Section 2A.6) and ongoing government-to-government Section 106 consultation. The PA would be finalized prior to the issuance of the Project ROD, and measures contained in the PA and HPTPs would be implemented prior to and during construction and post-construction during maintenance and operation activities (APM-CULT-01, BMP-CULT-02, BMP-CULT-04) (Appendix 2A, Section 2A, Section 2A.6).

Resolution measures for adverse effects to historic properties located within the CDCA Plan area are further outlined by specific compliance requirements discussed in Section 4.6.8. APMs and BMPs for minimizing effects to areas of tribal concern are contained in Appendix 2A.

4.7.7 Construction of Full Route Alternative and Subalternative Effects

4.7.7.1 Proposed Action

The Proposed Action follows the existing DPV1 transmission line; as a result, concerns to Indian tribes regarding new disturbance, access considerations, and intrusion on culturally significant environments would be minimized with the following exceptions:

Segment p-17 includes a site with exposed human remains and may indicate an increased potential for encountering additional human remains with ground disturbing activities; Indian tribes have indicated that human remains should not be disturbed and should remain in place. Impacts to concerns to Indian tribes would be major and long term and could be resolved only through avoidance. See discussion in Section 4.7.4.5.

Segments p-17 and p-18 pass through a culturally significant area that Indian tribes do not want physically disturbed by construction, made more accessible to the public through new access roads, nor changed by visual intrusions of Project structures or facilities. Impacts to areas of concern to Indian tribes would be major and long-term. See discussion in Section 4.7.4.5.

Other segments associated with the Proposed Action are near intaglio sites and petroglyphs, both of which are site types of elevated spiritual importance to Indian tribes. If these features are measurably affected by visual changes, the sites would be permanently affected from a perspective of Indian tribes. See discussion regarding Ripley Intaglio (south of Segment p-15e) in Section 4.7.4.5, of Segment p-06 in Section 4.7.4.2, and Segment p-13 in Section 4.7.4.4.

Previously recorded cultural resources sites that contain prehistoric trail segments are located on Segments p-04, p-06, p-07, p-09, p-10, p-11, p-12, p-13, p-14, p-15e. Additional trails are known to be present throughout the Colorado River and California Zone, and were utilized by the Mohave people and others. Major trails include the Coco-Maricopa Trail and the Salt Song Trail (a metaphysical trail). Trails are of significance to Indian tribes as part of traditional native infrastructure associated with travel across the landscape. Trails may also be potentially sensitive to indirect visual effects. Depending on the viewshed and structure placement, indirect visual impacts to trail segments could range between negligible and major. If there are measurable effects, they would be long-term.

Segment p-15e crosses the Colorado River, which is of spiritual importance to Indian tribes. Visual considerations of the river crossing should be considered in an indirect effects analysis. Given that Segment p-15e parallels the existing DPV1 transmission line, visual effects may be minor to moderate, but would be long-term.

Resolution Measures

Resolution measures for concerns to Indian tribes would be developed and outlined in the PA, HPTPs, or the ROD, and identified during ongoing Section 106 government-to-government consultation. The PA would be finalized prior to the issuance of the Project ROD, and measures contained in the PA and HPTPs would be implemented prior to and during construction and post-construction during maintenance activities and operations.

In addition, APMs and BMPs (Appendix 2A) as well as stipulations that would be a part of the ROD outline specific protocols for areas of tribal concern. These APMs, BMPs, and stipulations address, but are not limited to, protocols specific to coordination and communication with Indian tribes, roads and access, compliance with applicable laws, and confidentiality, among other procedures that may resolve potential adverse effects.

4.7.7.2 Alternative 1: I-10 Route

Previously recorded cultural resources sites that contain prehistoric trail segments are located on Alternative 1 Segments i-03, qs-01, i-06, i-07, i-08s, and ca-09. The importance of trails to Indian tribes and the type and magnitude of effects would be the same as those described in Section 4.7.7.1.

Two sites located along Segment i-07 (a component of Alternative 1) contain intaglios. The importance of intaglios to Indian tribes and the type and magnitude of effects would be the same as those described in Section 4.7.4.4.

Segment ca-04 crosses the Colorado River. The Colorado River is of spiritual importance to Indian tribes. Visual considerations of the river crossing should be considered in an indirect effects analysis. Given that Segment ca-04 parallels the existing I-10 freeway corridor, visual effects may be minor to moderate, but would be long-term.

<u>Resolution Measures</u>

Resolution measures for concerns to Indian tribes would be the same as those describe in Section 4.7.7.1.

<u>Subalternatives to Alternative 1</u>

Subalternative 1A
Previously recorded cultural resources sites that contain prehistoric trail segments are located within 0.5-mile of Segments x-02a and x-02b. Segment i-01 (Alternative 1) has no known concerns to Indian tribes. As a result, Subalternative 1A has a greater potential to impact areas of known concern to Indian tribes.

Subalternative 1B
Previously recorded cultural resources sites that contain prehistoric trail segments are located within the 1-mile corridor of Segments x-02a and x-02b. Segment i-01 has no known concerns to Indian tribes. As a result, Subalternative 1B has a greater potential to impact areas of known concern to Indian tribes.

Subalternatives 1C, 1D and 1E.
No concerns to Indian tribes have been identified for Subalternatives 1C, 1D, and 1E.

4.7.7.3 Alternative 2: BLM Utility Corridor Route

Previously recorded cultural resources sites that contain prehistoric trail segments are located on Segments i-03, qs-01, p-09, p-10, p-11, p-12, p-13, p-14, p-15e, p-16, x-07, x-15, x-16, and ca-09.

The importance of trails to Indian tribes and the type and magnitude of effects would be the same as those described in Section 4.7.6.1.

Alternative 2 includes segments near intaglios. The Ripley Intaglio Site is located within the 5-mile indirect effects analysis area of Segment p-15e. Another site containing an intaglio is within the 200-foot analysis corridor of Segment p-13. The importance of intaglios to Indian tribes and the type and magnitude of effects would be the same as those described in Section 4.7.7.1.

Segment p-15e crosses the Colorado River. The Colorado River is of spiritual importance to Indian tribes. Visual considerations of the river crossing should be considered in an indirect effects analysis. Given that Segment p-15e parallels the existing DPV1 transmission line, visual effects may be minor to moderate, but would be long-term.

Resolution Measures

Resolution measures for concerns to Indian tribes would be the same as those describe in Section 4.7.7.1.

Subalternatives to Alternative 2

Subalternative 2A
Trails may potentially exist in Segments d-01, x-02a, and x-02b. Additionally, the Eagletail Petroglyph Site, is within the 5-mile indirect effects analysis area of Segment d-01. Segments p-01 and i-01 (Alternative 2) have no known concerns to Indian tribes. As a result, Subalternative 2A has a greater potential to impact areas of known concern to Indian tribes.

Subalternative 2B
Trails may potentially exist in Segment p-04. Segment i-01 (Alternative 2) has no known concerns to Indian tribes. As a result, Subalternative 2B has a greater potential to impact areas of known concern to Indian tribes.

Subalternative 2C
Trails may potentially exist in Segments cb-02, cb-06, p-11, and p-12. As a result, potential impacts to areas of concern to Indian tribes are comparable between Subalternative 2C and Alternative 2.

Subalternative 2D
Trails may potentially exist in Segments cb-03 and p-11. As a result, potential impacts to areas of concern to Indian tribes are comparable between Subalternative 2D and the segment it replaces.

Subalternative 2E
Trails may potentially exist in Segment ca-02. As a result, potential impacts to areas of Indian tribal concern are comparable between Subalternative 2E and the segments it replaces.

4.7.7.4 Alternative 3: Avoidance Route

Segments cb-01, x-05, and cb-04 cross through areas of largely undisturbed desert where new access and new visual intrusions would be introduced. As a result, potential impacts to concerns to Indian tribes regarding new access and intrusion on pristine landscapes would be moderate to major and long-term.

Previously recorded cultural resources that contain prehistoric trail segments are potentially located on Segments i-03, p-07, p-09, p-14, x-05, cb-01, cb-05, ca-09, and cb-10. The importance of trails to Indian tribes and the type and magnitude of effects would be the same as those described in Section 4.7.7.1.

Segment cb-10 crosses the Colorado River, which is of spiritual importance to Indian tribes. Visual considerations of the river crossing should be considered. Given that Segment cb-10 is located in an agricultural landscape, visual effects may be moderate to major, but would be long-term.

Resolution Measures

Resolution measures for concerns to Indian tribes would be the same as those describe in Section 4.7.7.1.

Subalternatives to Alternative 3

Subalternative 3A
Trails may potentially exist in Segments d-01, x-02a, and x-02b. Additionally, the Eagletail Petroglyph Site, is within the 5-mile indirect effects analysis area of Segment d-01. Segments p-01 and i-01 (Alternative 3) have no known concerns to Indian tribes. As a result, Subalternative 3A has a greater potential to impact areas of known concern to Indian tribes.

Subalternative 3B
There are no known issues of concern to Indian tribes in Segments i-01 or i-02. Trails may potentially exist in Segment p-04 (Alternative 3). As a result, Subalternative 3B has a lower potential to impact areas of known concern to Indian tribes.

Subalternative 3C
Trails may potentially exist in Segment x-04 and i-03. As a result, potential impacts to areas of concern to Indian tribes are comparable between Subalternative 3C and Alternative 3.

Subalternative 3D
No issues of concern to Indian tribes have been identified for Subalternative 3D or Alternative 3, and effects to areas of concern to Indian tribes would be comparable.

Subalternative 3E
Subalternative 3E consists of Segments qs-01 and x-07. It would replace Segment x-05, and must be combined with Subalternatives 3D and 3G, or 3J. Subalternative 3E and Segment x-05 may all contain trails; however, Segment x-05 crosses through an undeveloped landscape that would potentially impact concerns to Indian tribes regarding new access and intrusion on pristine landscapes. As a result, Subalternative 3E appears to have a lesser impact to areas of concern to Indian tribes. While Subalternative 3E needs to be assessed in conjunction with its pairing with Subalternatives 3D and 3G, or 3J, none of these subalternatives have known issues of concern to Indian tribes.

Subalternative 3F
Subalternative 3F consists of Segment x-06. It would replace Segment x-05 (Alternative 3) and would need to be combined with Subalternatives 3D and 3G, or 3J. Subalternative 3F and Segment x-05 contain trails, however, Segment x-05 crosses through an undeveloped landscape and that

would potentially impact concerns to Indian tribes regarding new access and intrusion on pristine landscapes. As a result, Subalternative 3F appears to have a lesser impact to areas of concern to Indian tribes. While Subalternative 3F needs to be assessed in conjunction with its pairing with Subalternatives 3D and 3G, or 3J, none of these subalternatives have known issues of concern to Indian tribes.

Subalternative 3G
Subalternative 3G consists of Segment qn-01. No known issues of concern to Indian tribes are present on Segment qn-01. However, Subalternative 3G should be further assessed in conjunction with its pairing with Subalternatives 3D, 3E, 3F, 3H, and/or 3J.

Subalternative 3H
Subalternative 3H consists of Segment qn-02. No known issues of concern to Indian tribes are present on Segment qn-02. However, Subalternative 3H should be further assessed in conjunction with its pairing with Subalternatives 3D and 3L.

Subalternative 3J
Subalternative 3J consists of Segment i-05. No known issues of concern to Indian tribes are present on Segment i-05. However, Subalternative 3J should be further assessed in conjunction with its pairing with Subalternatives 3E, 3F, or 3G, and 3H.

Subalternative 3K
Trails may potentially exist on Subalternative 3K. There are no known issues of concern to Indian tribes on Segment cb-04 (Alternative 3). As a result, Subalternative 3K has a greater potential to impact areas of known concern to Indian tribes.

Subalternative 3L
Trails may potentially exist in Subalternative 3L and the segments of Alternative 3 it replaces. As a result, potential impacts to areas of concern to Indian tribes are comparable between Subalternative 3L and the segments it replaces. Potential impacts must be assessed in conjunction with its pairing with Subalternative 3H, although Subalternative 3H has no known areas of concern to Indian tribes.

Subalternative 3M
The crossing at the Colorado River in Segment p-15e parallels the existing DPV1 transmission line so the visual impact of the crossing would be less intrusive than that of Alternative 3. Subalternative 3M appears to have a similar potential to impact areas of known concern to Indian tribes.

4.7.7.5 Alternative 4: Public Lands Emphasis Route

Previously recorded cultural resources sites that contain prehistoric trail segments are potentially located on Segments d-01, x-04, x-06, x-09, p-10, p-13, p-14, cb-02, cb-06, and ca-09. The importance of trails to Indian tribes and the type and magnitude of effects would be the same as those described in Section 4.7.7.1.

The Eagletail Petroglyph Site, potentially sensitive to indirect visual impacts, is located within the 5-mile indirect effects analysis area of Segment d-01 in the Eagletail Mountains. Depending on the viewshed and structure placement, indirect visual impacts to this property could range between negligible and moderate. If there is a measurable effect, it would be long-term.

Alternative 4 includes segments near intaglios. The Ripley Intaglio Site is located within the 5-mile indirect effects analysis area of Segment p-15e. Another site containing an intaglio is within the 200-foot analysis corridor of Segment p-13. The importance of intaglios to Indian tribes and the type and magnitude of effects would be the same as those described in Section 4.7.7.1.

Segments cb-02 and cb-04 cross through areas of largely undisturbed desert where new access and new visual intrusions would be introduced. As a result, potential impacts to concerns to Indian tribes regarding new access and intrusion on pristine landscapes would be moderate to major and long-term.

Segment p-15e crosses the Colorado River, which is of spiritual significance to Indian tribes. Visual considerations of the river crossing should be considered in an indirect effects analysis. Given that Segment p-15e parallels the existing DPV1 transmission line, visual effects may be minor to moderate, but would be long-term.

Resolution Measures

Resolution measures for concerns to Indian tribes would be the same as those describe in Section 4.7.7.1.

Subalternatives to Alternative 4

Subalternative 4A
There are no known issues of concern to Indian tribes on Subalternative 4A and is less likely to impact areas of known concern to Indian tribes.

Subalternative 4B
Subalternative 4B would have impacts to areas of concern to Indian tribes that are comparable between Subalternative 4B and the segment of Alternative 4 it replaces.

Subalternative 4C
Subalternative 4C has no known issues of concern to Indian tribes on Subalternative 4C. However, potential impacts must be further assessed in conjunction with pairing Subalternative 4C with Subalternatives 4D or 4J.

Subalternative 4D
Both segments of Subalternative 4D are projected to contain trails; in addition, Segment x-05 crosses through an undeveloped landscape that would potentially impact concerns to Indian tribes regarding new access and intrusion on pristine landscapes. Subalternative 4D would be paired with Subalternatives 4C or 4J, which have no known concerns to Indian tribes. Because it crosses through an undeveloped landscape, Subalternative 4D would have a greater potential to impact areas of known concern to Indian tribes than the segments of Alternative 4 it would replace.

Subalternative 4E
Subalternative 4E is projected to contain trails and both Segments cb-01 and cb-02 (Alternative 4) cross through undeveloped landscapes that would potentially impact concerns to Indian tribes

regarding new access and intrusion on pristine landscapes. As a result, potential impacts to areas of concern to Indian tribes are comparable between Subalternative 4E and the segments of Alternative 4 it replaces.

Subalternative 4F
Subalternative 4F is projected to contain trails. As a result, potential impacts to areas of concerns to Indian tribes are comparable between Subalternative 4F and the segments of Alternative 4 it replaces.

Subalternative 4G
Both segments of Subalternative 4G are projected to contain trails, as does Segment cb-02 of Alternative 4. However, Segment cb-02 and cb-04 of Alternative 4 cross through undeveloped landscapes that would potentially impact concerns to Indian tribes regarding new access and intrusion on pristine landscapes. As a result, Subalternative 4G would have a lesser potential to impact areas of known concern to Indian tribes than the segments of Alternative 4 it replaces.

Subalternative 4H
Subalternative 4H, which includes Segment i-07, is projected to contain trails, and the Limekiln Wash Intaglio is within the segment's 200-foot analysis corridor. As a result, Subalternative 4H has high potential to have a major to moderate effect on areas of concern to Indian tribes. These potential impacts must be further assessed in conjunction with the pairing of Subalternative 4H with Subalternatives 4G and 4K, which also are identified as including features of concern to Indian tribes.

Subalternative 4J
There are no known issues of concern to Indian tribes on Subalternative 4J. Any potential impacts must be further assessed in conjunction with the pairing of Subalternative 4J with Subalternative 4H, which has a high potential to have a moderate to major effect on areas of concern to Indian tribes.

Subalternative 4K
Subalternative 4K is projected to contain trails; as a result, Subalternative 4K demonstrates the potential to impact areas of known concern to Indian tribes. The potential effect to areas of concern to Indian tribes by Subalternative 4K must be further evaluated in conjunction with its potential pairing with Subalternative 4H, which also has areas of concern to Indian tribes, and Subalternative 4N.

Subalternative 4L
Subalternative 4L contains trails and crosses the Colorado River in an agricultural landscape. Because the Colorado River is of spiritual significance to Indian tribes, the visual impacts of this crossing would need to be assessed. As a result, Subalternative 4L would have potential to impact areas of known concern to Indian tribes. The potential effect to areas of concern to Indian tribes by Subalternative 4L must be further evaluated in conjunction with its pairing with Subalternative 4M, although no areas of concern have been identified for Subalternative 4M.

Subalternative 4M
There are no known issues of concern to Indian tribes on Subalternative 4M or the segment of Alternative 4 it replaces. The potential effect to areas of concern to Indian tribes by Subalternative 4M must be further evaluated in conjunction with its pairing with Subalternative 4L.

Subalternative 4N
There are no known issues of concern to Indian tribes on Subalternative 4N. The potential effect to areas of concern to Indian tribes by Subalternative 4N must be further evaluated in conjunction with the concerns to Indian tribes identified for Subalternatives 4H, 4K, and 4M.

Subalternative 4P
Segments p-17 and p-18 of Subalternative 4P contain numerous issues of concern to Indian tribes. Human remains are known to exist along Segment p-17, and the area surrounding both segments is still utilized by modern Indian tribes. Additionally, the Mule Tank Discontiguous Rock Art District, is located within the 1-mile analysis corridor of Segment p-17 and would need to be evaluated for visual impacts. While trails are projected to occur along Alternative 4, the potential impact to areas of concern to Indian tribes is substantially greater on Subalternative 4P.

4.7.8 Residual Impacts

The construction of a new transmission line on the landscape would have some residual effect on issues of concern to Indian tribes because of the permanence of the infrastructure for the life of the Project. In particular, the visual effects of the transmission line infrastructure would have a residual impact on the environment and continue to contribute to the erasing the ancestral footprint of the Indian tribes from the landscape. The residual effect would be more pronounced in locations where the transmission line does not parallel existing infrastructure. Visual aspects can also be addressed through Project design and resolution of adverse effects, but the changes to environmental conditions cannot be avoided.

Secondly, the access requirements for operations and maintenance leave the residual possibility of increasing recreational access into areas that may currently be visited infrequently. This increases the risk of inadvertent damage or vandalism to features significant to Indian tribes. Access concerns may be addressed in the PA or the ROD by including specific protocols to restrict access into sensitive areas by barrier placement or providing regular patrols to prevent damage or vandalism.

4.7.9 CDCA Plan Compliance

The same CMAs, BMPs, and APMs CMAs discussed under Section 4.6.8 above are applicable to areas of Indian tribal concern. CMAs LUPA-CUL-4, LUPA-TRANS-CUL-1 through LUPA-TRANS-CUL-6, and DFA-VPL-CUL-1 through DFA-VPL-CUL-7 would apply to the Project (Appendix 2C). DFA-VPL-CULT-7 would also apply to the Project (Appendix 2C) and would be satisfied by information provided in Sections 3.2.1.1, 5.2.2, and 5.3, as well as Appendix 2D.

LUPA-CUL-4 is specific to the Project design to minimize impacts on cultural resources, including those places of elevated cultural or spiritual significance to Federally recognized tribes. Compliance with LUPA-CUL-4 would be satisfied with BMP-CULT-03, which states that the applicant would follow avoidance and stipulations outlined in the PA and appropriate HPTPs, and

APM-CULT-01 and APM-CULT-02 (Appendix 2A, Section 2A.6), in which the applicant commits to following those stipulations.

LUPA-TRANS-CUL-1 and DFA-VPL-CUL-1 are specific to the responsibility of the Project applicant to pay for costs associated with the Project's cultural resources compliance. Compliance with LUPA-TRANS-CUL-1 and DFA-VPL-CUL-1 would be satisfied by APM-CULT-01 and APM-CULT-02, in which the applicant commits to conducting a cultural resources inventory of the direct and indirect APE, preparing HPTPs, and conducting cultural resource monitoring during Project construction, operations, maintenance, and decommissioning (as appropriate) to meet stipulations outlined in the PA (Appendix 2D).

LUPA-TRANS-CUL-2 and DFA-VPL-CUL-2 are specific to the applicant's payment of compensatory mitigation fees for cumulative and indirect effects to historic properties as a result of Project construction, operations, maintenance, and decommissioning. Compliance with LUPA-TRANS-CULT-2 and DFA-VPL-CUL-2 would be satisfied by BMP-CULT-05 (Appendix 2A, Section 2A.6), which outlines the fee structure of the compensatory mitigation fee. The compensatory mitigation fee structure is also outlined in the stipulations contained within the PA (Appendix 2D).

LUPA-TRANS-CUL-3 and DFA-VPL-CUL-3 are specific to the applicant's payment of management fees as part of the compensatory mitigation fee contained in LUPA-TRANS-CUL-2 and DFA-VPL-CUL-2, respectively. Compliance with LUPA-TRANS-CUL-3 and DFA-VPL-CUL-3 would be satisfied by BMP-CULT-05, which outlines the fee structure of the management fee as part of the compensatory mitigation fee. The management fee and compensatory mitigation fee structure is also outlined in the stipulations contained within the PA (Appendix 2D).

LUPA-TRANS-CUL-4 and DFA-VPL-CUL-4 are specific to the development of a cultural resources sensitivity analysis based on existing cultural resources data in the CDCA Plan area for consideration in Project planning and alternative selection. Compliance with LUPA-TRANS-CUL-4 and DFA-VPL-CUL-4 would be satisfied with BMP-CUL-06. The BLM has prepared a sensitivity analysis (Kline 2017).

LUPA-TRANS-CUL-5 and DFA-VPL-CUL-5 are specific to the provision of a statistically significant cultural resources sample survey to be used in Project planning. Compliance with LUPA-TRANS-CUL-5 and DFA-VPL-CUL-5 would be satisfied by BMP-CULT-07 (Appendix 2A, Section 2A.6), which requires cultural resources Class III survey of segments p-17 and p-18 to be conducted during the NEPA and CEQA analyses to meet the conditions of LUPA-TRANS-CUL-5 and DFA-VPL-CUL-5. The Class III survey of Segments p-17 and p-18 has been conducted.

LUPA-TRANS-CUL-6 and DFA-VPL-CUL-6 is specific to the applicant's justification to consider areas sensitive to cultural resources in NEPA and CEQA analyses. Compliance with LUPA-TRANS-CUL-6 and DFA-VPL-CUL-6 would be satisfied by BMP-CULT-08, which requires such justification from the Project applicant.

DFA-VPL-CUL-7 speaks to completion of the Section 106 process. Compliance with DFA-VPL-CUL-7 is satisfied in Sections 3.6.1.1 and 3.7.1.2. Section 3.6.1.1 presents the regulatory requirement of the NHPA that includes Section 106. Section 3.6.1.1 summarizes the process of drafting the PA. Section 3.7.1.2 presents the efforts of consultation with Indian tribes. Appendix 2D is the revised draft PA for the Project.

4.7.10 Unavoidable Adverse Effects

Changes to the landscape and access changes would be an unavoidable adverse effect if concerns to Indian tribes cannot be avoided by Project design, APMs, BMPs, and resolution measures. The CRIT have expressed that the Project would result in adverse impacts on CRIT land that appreciably exceed those of the general population, as development impacts their ancestral ties to the land.

Prior to construction, continuing Section 106 consultation would be required to identify areas of elevated spiritual importance to Indian tribes to identify these areas for avoidance. Class III cultural resource surveys would be conducted to identify sites that need to be avoided or addressed by adverse effect resolution measures. Monitoring during construction would minimize the potential for inadvertent damage to intact subsurface deposits that could not be identified during Class III surveys. However, if excavation damages cultural features or disturbs human remains, the damage done would be unavoidable.

Areas of concern to Indian tribes that are sensitive to visual change would need to be assessed so that impacts could be minimized through analysis of the viewshed and structure placement. An unavoidable impact would occur to the extent that transmission line infrastructure can be seen from intaglios, petroglyphs, or other resources of elevated concern to Indian tribes. Project elements that introduce intrusion to pristine landscapes and the crossing of the Colorado River would also constitute an unavoidable adverse effect to Indian tribes.

Unavoidable adverse effects may also occur if the Project changes existing access to culturally important areas to tribes, or if new access results in damage to resources that have previously been largely inaccessible.

4.7.11 Cumulative Effects

The Project Area is crossed by numerous utility and transportation corridors, including the I-10 corridor, SR 78, US 95, SR 95, the DPV1 transmission line, numerous local transmission and distribution lines, solar facilities, and the EPNG pipeline, as well as local roads. The landscape has been further altered by the development of the Town of Quartzsite and the City of Blythe, and the expansion of historic and modern agriculture. Future plans for the area include the development of additional large solar facilities in the western portion of the Project Area (Table 3.20-5).

Various tribes have been consulted and informed of the Project. Tribes have expressed interest and concern about potential effects to the native landscape, the viewshed, trails and elements of Native infrastructure across the desert, cultural resource sites, and areas of elevated spiritual importance that are within their traditional territories and may have been inhabited or used by their ancestors. Noted concerns include the transmission lines and solar facilities within the viewshed. Past actions affecting concerns of Indian tribes include vandalism and looting of prehistoric sites, unauthorized excavation of prehistoric sites, recreational use that impacts cultural resources, roadway and infrastructure construction, and urban and rural developments. Past, present, and reasonably foreseeable future development (Table 3.20-5; and Figure 3.20-1, Appendix 1) would contribute to cumulative impacts to concerns of Indian tribes in the region.

All of this development has had the effect of substantially altering the native landscape of affiliated Indian tribes. Large linear projects, such as DPV1 and the construction of I-10 and the CAP canal have had the effect of altering the viewshed of the native landscape and disrupting the trails and elements of traditional native infrastructure across the desert. In particular, the DPV1 transmission corridor crosses the viewshed of the Mule Tank Discontiguous Rock Art District. Additional structures along Segments p-17 and p-18 in the line of site of this resource would continue to cumulatively affect the viewshed. The increase in visual degradation, combined with all previous disturbances and developments, may result in a moderate to major cumulative impact on the Mule Tank Discontiguous Rock Art District.

Future projects in the western portion of the Project Area include large solar facilities (Blythe Mesa Solar, Desert Quartzite Solar, and Crimson Solar Projects) and the Blythe Energy Power Plant and Sonoran Energy Project, all of which cumulatively affect issues of concerns to Indian tribes, including potential visual impacts to the Mule Mountains, an area of importance to the tribes. These cumulative effects are manifest in terms of the loss of pristine environment, erasure of the tribal footprint on the landscape, vandalism of archaeological sites due to increased OHV traffic and visitation, potential restriction to areas of elevated spiritual importance for Indian tribal ceremonies, and the disruption of Native infrastructure. Cumulative impacts to cultural resource sites would be the same as those described in Section 4.5.11. Impacts to prehistoric cultural resources that convey the significance of the landscape, including those not eligible for the NRHP and historic properties mitigated through data recovery, cumulatively impact the cultural landscape and linkage. The development of the Project further contributes to these cumulative effects. Minimization of cumulative effects of this Project would be addressed through implementation of the PA which directs avoidance of sites and minimization of the Project footprint before any consideration of mitigation of sites and data recovery.

4.7.12 Irreversible and Irretrievable Commitment of Resources

Given the strong ancestral ties of Indian communities to the landscape of the Project, construction related to the Project that would measurably affect existing tribal access into spiritual areas; enhance public access into previously remote areas and increase the risk of resource damage; result in the loss or diminishment of the Indian cultural landscapes, TCPs, and pristine areas; or result in the disturbance of human remains would constitute an irreversible and irretrievable impact to Indian values. Impacts to cultural resources, including those not eligible for the NRHP, as well as sites mitigated, represent an irreversible and irretrievable commitment of those resources. However, provisions of the PA (Appendix 2D) requiring detailed ethnographic and ethnobotanical studies, and cultural landscape overviews, would be a benefit (positive impact) to the tribes by compiling their traditional use of the landscape into a reference for future generations.

4.7.13 Relationship of Short-term Uses and Long-term Productivity

The short-term use of the ROW during construction of the Project could result in measurable effects to areas of tribal concern by altering existing tribal access into spiritual areas; enhancing public access into previously remote areas; the loss or diminishment of the tribal cultural landscapes, TCPs, and pristine areas; or the disturbance of human remains. If the short-term use of the ROW results in the measurable alteration of these areas of concern to Indian tribes, the long-term potential of their qualities would be reduced or eliminated.

4.8 LAND USE

4.8.1 Introduction

Potential impacts to land use are discussed in terms of land ownership, compliance with management of lands, land use authorizations and ROWs (including lands and realty actions), and future or planned land uses.

4.8.2 Methods for Analysis

4.8.2.1 Analysis Area

The analysis area for land use includes a 4,000-foot corridor encompassing the Project. Because there is some flexibility in final siting of the temporary use areas (construction), Project structures, and SCS, this analysis area will include all potential disturbance areas along with areas where indirect effects could occur.

4.8.2.2 Assumptions

No assumptions were made when performing the analysis of Project impacts on land use.

4.8.2.3 Environmental Effect Indicators, Magnitude, and Duration

The following indicators were used when analyzing potential impacts to land use:

- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including but not limited to the general plan, specific plan, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect;
- Conflict with existing utility ROWs;
- Conflict with existing or authorized land uses, specifically where the Project would create a direct long-term impact;
- Physical conflict with existing residential, commercial, industrial, military, or agricultural uses (i.e., displacement of homes, businesses, solar energy facilities, center-pivot irrigation agriculture fields);
- Conflict with planned land uses, specifically residential subdivisions or other sensitive land uses at the final plat approval stage;
- Existing land uses not being restored to allow for pre-construction uses or activities (for areas disturbed and not containing permanent structures);
- Significant nuisance impacts to existing land uses; or

- Interference with military operations at the YPG.

Impacts to land use may be negligible, minor, moderate, or major, and may have durations that are qualified as temporary, short term, or long term (Table 4.8-1, Section 4.1).

Table 4.8-1 Land Use Impact Magnitude and Duration Definitions

ATTRIBUTE OF IMPACT		DESCRIPTION SPECIFIC TO LAND USE
Magnitude	Negligible	Very little effect on land uses such that the effect would not be perceptible to a human observer or user. Action would be in compliance with land management plans and zoning and would not conflict with existing ROWs or other authorized uses. Less than 5 percent of a land area associated with a particular use would be affected.
	Minor	Action would be in compliance with land management plans and zoning and would not conflict with existing ROWs or other authorized uses. Less than 10 percent of a land area associated with a particular use would be affected.
	Moderate	Action may or may not be in compliance with land management plans and zoning and may or may not conflict with existing ROWs or other authorized uses. Less than 25 percent of a land area associated with a particular use would be affected.
	Major	Action would not be in compliance with land management plans and zoning or would conflict with existing ROWs or other authorized uses. More than 25 percent of a land area associated with a particular use would be affected.
Duration	Temporary	Limited to active construction or decommissioning.
	Short-term	10 years or less.
	Long-term	More than 10 years.

4.8.3 No Action Alternative

Under the No Action Alternative, no ROW would be granted for the Project and the transmission line, SCS, and ancillary facilities would not be constructed. The BLM-administered land on which the Project is proposed would continue to be managed as it currently exists. Lands in the analysis area would remain as is, which is primarily undeveloped desert land available for grazing, subject to existing closures or restrictions. Current land uses in the analysis area described in Section 3.8 would continue under the No Action Alternative. There would be no changes that would alter existing land uses beyond current conditions.

4.8.4 Construction of Action Alternative Segments

4.8.4.1 Direct and Indirect Effects Common to All Action Alternatives

Land Use Authorizations and Rights-of-Way

BLM-authorized land uses, such as roadways, transmission lines, utilities, and pipelines; oil, gas, solar energy, and mining leases; and other permits, leases, and easements (HDR 2017d); may be temporarily affected by changes in access, but these uses would not be precluded by construction of the Project. For non-BLM lands, ROWs would be obtained as easements or leases, as appropriate. Encroachment permits would be obtained for the crossing of federal, state, and county roadways, as applicable.

Residential

Private landowners may experience minor, temporary nuisance impacts in residential areas where the temporary activities involved with construction (i.e., noise, dust, and heavy equipment) is typically incompatible with local zoning restrictions. Where private lands would be intersected outside of existing ROWs, easements would be negotiated with the landowner. The temporary impacts would be short term and would cease once construction activities are completed at a segment. No new access roads would be developed in the residential areas of the municipalities that occur within the analysis area.

Agricultural

Construction activities may temporarily disrupt agricultural activities and remove croplands, NRCS-classified farmlands, and Williamson Act farmlands from production. NRCS-classified and Williamson Act farmlands would be affected by soil disturbance during construction, including soil erosion, disruption of drainage patterns, mixing of topsoil and subsoil, potential loss of topsoil, and soil compaction. These effects would be long term, but minor because the actual acreage of prime farmlands affected would be substantially less than that available in the analysis area.

Military

Construction of the Project may interfere with the YPG's military operations if construction requires the use of YPG roads. Construction vehicles and equipment on these roads could interfere with YPG military vehicles.

Industrial

Construction of the Project may interfere with construction of other industrial facilities or maintenance of existing facilities by causing changes in access or generating dust.

4.8.4.2 East Plains and Kofa Zone

Direct and Indirect Effects Common to All Segments in the Zone

Land Use Authorizations and Rights-of-Way
BLM-administered land in the East Plains and Kofa Zone falls under the management of the Bradshaw-Harquahala, Lake Havasu, Lower Sonoran, and Yuma RMPs. Segments that occur within the management of the Bradshaw-Harquahala, Lake Havasu, and Yuma RMPs must occur within a designated utility corridor. Approximately 72 percent of the Proposed Action and Alternative Segments on BLM-administered land would be within designated utility corridors. All of the segments within the Bradshaw-Harquahala, Lake Havasu, and Lower Sonoran Field Offices would be within designated corridors -and thus be in compliance. However, several segments that are within the 28 percent not in designated corridors are in the YFO, and therefore would not be in compliance with that RMP (Table 4.8-2).

A portion of the East Plains and Kofa Zone is within La Paz County; Alternative Segments in La Paz County that are not within a designated corridor, along a state highway or Interstate, or other developed linear facility would not be consistent with the La Paz County Zoning Plan.

The authorization of a ROW within the Kofa NWR requires a "Finding of Appropriateness of a Refuge Use" to determine whether the use meets the criteria for an appropriate use. The Kofa NWR was established in 1939 "for the conservation and development of natural wildlife resources, with an emphasis on conservation of desert bighorn sheep" (USFWS 2017). Management objectives include to "maintain and enhance the natural diversity of flora and fauna…" and to "recover population and maximize genetic diversity of desert bighorn sheep; reintroduce Sonoran pronghorn and establish a viable population; manage fire; manage wildlife waters; and prevent establishment of invasive species" (USFWS 2017). Upon review of the application for the ROW for this segment, the USFWS determined that the Project does not meet the criteria for an appropriate use because it "does not promote wildlife-dependent recreation and does not support the purpose for which the refuge was established and the mission of the NWR System" (USFWS 2017).

The USFWS (2017) found that the construction and maintenance of the Project on the Kofa NWR:

- "May cause habitat fragmentation, degrade habitat quality through introduction of contaminants, disrupt wildlife movement corridors, alter hydrology, facilitate introduction of invasive species, and disturb wildlife";
- "Would conflict with the legal requirements to maintain biological integrity, diversity, and environmental health";
- "Will create additional traffic on the east-west road across the northern part of Kofa NWR…" that "will increase the likelihood of off-road vehicular incursions";
- "Would increase fire danger from the power line directly";
- Would be "damaging and detrimental to the quality of wildlife-dependent recreation including hunting, wildlife viewing, wildlife photography, and interpretation"; and that
- The cumulative and incremental impacts of the new proposed ROW in addition to the existing power line and pipeline ROWs may pose the greatest impact to the refuge (USFWS 2017).

The Project was found not to be an appropriate use on the refuge; therefore, this would be a major impact on land use if the Project were approved.

Residential
There are 61 residential parcels on 2,968 acres in the land use analysis area in the East Plains and Kofa Zone. This is approximately 3 percent of the analysis area, which is a negligible amount of the analysis area. Impacts to residential uses would be the same as those described in Section 4.8.4.1.

Agricultural
There are 4,908 acres of prime farmland and 426 acres of farmland of unique importance in the East Plains and Kofa Zone. This is approximately 3 percent of the analysis area, which is a

negligible amount of the analysis area. Impacts to agricultural uses would be the same as those described in Section 4.8.4.1.

Direct and Indirect Segment-specific Effects

Land Use Authorizations and Rights-of-Way

Segments x-01, x-02b, x-03 and x-04 cross BLM-administered land that is not within a designated utility corridor; a utility corridor would need to be designated for the segments to be in compliance with the Yuma RMP. A portion of Segment i-03 would fall approximately 0.2-mile outside of a designated corridor; this portion would not be in compliance with the Yuma RMP (Section 4.8.5.2). Alternative Segments x-01 through x-04 would not be consistent with the La Paz County Zoning Plan.

Most of the segments in the East Plains and Kofa Zone would cross Arizona state trust land; between 0.5 miles (Segments p-02 and p-04) and 6 miles (Segment i-03) of Arizona state trust land parcels would be crossed. In general, the crossing of Arizona state trust land would not occur along section or Arizona state trust land parcel boundaries, which may limit the future sale or lease of these parcels to other developers by the ASLD. This would be a minor to moderate, long-term impact to future ASLD management decisions in the East Plains and Kofa Zone depending on the location and length of the Arizona state trust land crossing.

Segment p-06 would cross 24 miles of the Kofa NWR; however, the Project was not found to be an appropriate use on the refuge and therefore approval to cross the Kofa NWR would not be granted to DCRT. Segment d-01 would cross an area designated in the Lower Sonoran RMP as low known sensitivity area which indicates it does not undermine proposed allocations. Therefore, Segment d-01 would be in compliance with this RMP.

Residential

The analysis area for Proposed Segments p-01 and p-02 would be the only Proposed segments in the East Plains and Kofa Zone that contain residential land. Within the Alternative segments, the analysis area for Segments i-02, i-04, in-01, and x-03 do not contain any residential land, but all other Alternative segments contain residential land. Impacts to residential land would be the same as those in Section 4.8.4.1.

Agricultural

Segments p-01, p-02, and p-03 would temporarily affect 166 acres and permanently remove up to 79 acres of agricultural land in the East Plains and Kofa Zone; although a small amount (136 acres) of NRCS-classified lands are present in the zone it is unlikely that there would be measurable impacts to NRCS-classified lands. This would be a permanent loss under the Proposed Action of less than 1 percent of the agricultural land or NRCS-classified lands in the zone which would be a negligible effect. Of the Alternative segments, Segment d-01 includes all of the prime farmland (4,772.2 acres) and farmland of unique importance (426.4 acres) in the East Plains and Kofa Zone.

Industrial

Alternative Segments i-01 and i-03 would cross the CAP and its associated ROW; however, the Project would span the CAP and ROW and would not infringe on this utility.

4.8.4.3 Quartzsite Zone

Direct and Indirect Effects Common to All Segments in the Zone

Land Use Authorizations and Rights-of-Way
BLM-administered land in the Quartzsite Zone falls under the management of the Lake Havasu and Yuma RMPs. Segments that occur within the management of the Lake Havasu RMP must occur within a designated utility corridor. Approximately 41 percent of the segments on BLM-administered land would be within designated utility corridors. All of the segments within the Lake Havasu Field Office would be within designated corridors and thus be in compliance. However, several segments that are within the 59 percent not in designated corridors are in the YFO, and therefore would not be in compliance with that RMP (Table 4.8-2).

Segments in the Quartzsite Zone, where they occur along the DPV1, other transmission lines, or I-10, would be consistent with the La Paz County Zoning Plan. Segments outside of these areas would not be consistent with this plan (Table 4.8-2). The land use study area in the Quartzsite Zone would include an area designated in the Town of Quartzsite General Plan as a Tier III growth area, which is identified for growth beyond the year 2035. The Project would have a minor impact on this land use and would not be in compliance with the General Plan (Table 4.8-2). The land use study area also includes the La Posa LTVA and Dome Rock 14-Day Camping Area; effects on these recreational land uses are discussed in Section 4.10.4.3.

Residential
There are 13 residential parcels on 619 acres in the land use analysis area in the Quartzsite Zone. This is approximately 2 percent of the analysis area, which is a negligible amount of the analysis area. Impacts to residential uses would be the same as those described in Section 4.8.4.1.

Agricultural
There is no NRCS-classified farmland in the Quartzsite Zone. Impacts to agricultural uses would be the same as those described in Section 4.8.4.1.

Direct and Indirect Segment-specific Effects

Land Use Authorizations and Rights of Way
The BLM-administered land in Alternative Segments qn-02, x-05, and x-06, and a portion of the BLM-administered land in Segments qs-01 and qs-02, would not be within a designated utility corridor, which would therefore not be in compliance with the Yuma RMP (Section 4.8.5.2). Alternative Segments x-05 and x-06 would not be consistent with the La Paz County Zoning Plan, which would be a moderate effect on the land use goals of La Paz County. Alternative segment qn-02 crosses a Tier III growth area, which is identified for growth beyond 2035. This would be a minor, long-term impact on land use and this segment would not be in compliance with the Town of Quartzsite General Plan (Table 4.8-2). The only segment in the Quartzsite Zone that would cross Arizona state trust land is Segment qn-02, which would cross 1 mile of Arizona state trust land along or near the boundary of the Arizona state trust land parcels. This would be a negligible to minor long-term effect on future ASLD management decisions in the Quartzsite Zone because, in general, the presence of the Project would have a negligible to minor impact on future land sales or leases.

Residential
The analysis area for the Proposed Segments does not contain any residential land. All of the residential land in the analysis area is contained within Alternative Segments qn-02, qs-01, and qs-02. Impacts to residential land would be the same as those described in Section 4.8.4.1.

Agricultural
There is no agricultural land associated with the Proposed segments in the Quartzsite Zone. Impacts to agricultural uses associated with Alternative segments would be the same as those described in Section 4.8.4.1.

4.8.4.4 Copper Bottom Zone

<u>Direct and Indirect Effects Common to All Segments in the Zone</u>

Land Use Authorizations and Rights-of-Way
BLM-administered land in the Copper Bottom Zone falls under the management of the Yuma RMP which states that new infrastructure should be within designated utility corridors unless locating it outside a designated corridor is the only practicable alternative. Approximately 72 percent of the Proposed Action and Alternative Segments on BLM-administered land would be within designated utility corridors and would be in compliance with the Yuma RMP. Several segments that are within the 28 percent not in designated corridors would not be in compliance with the Yuma RMP (Table 4.8-2). Segments in the Copper Bottom Zone, where they occur outside designated corridors, would be consistent with the La Paz County Zoning Plan.

Residential
There is very little residential land (seven parcels on 113 acres) in the Copper Bottom Zone, amounting to less than 1 percent of the analysis area which would be a negligible amount of the analysis area. Impacts to residential uses would be the same as those described in Section 4.8.4.1.

Agricultural
There is no NRCS-classified farmland in the Copper Bottom Zone Impacts to agricultural uses would be the same as those described in Section 4.8.4.1.

Military
There is approximately 270 acres of land under the jurisdiction of the YPG in the Copper Bottom Zone, amounting to less than 0.1 percent of the YPG which would be a negligible effect. Impacts to military uses on the YPG would be the same as those described in Section 4.8.4.1.

<u>Direct and Indirect Segment-specific Effects</u>

Land Use Authorizations and Rights-of-Way
None of the BLM-administered land in Segments cb-01, cb-02, cb-04, cb-05, and cb-06 would be within a designated utility corridor, which would not be in compliance with the Yuma RMP (Section 4.8.5.2). Proposed Segment p-11 and Alternative Segments cb-03 and i-06 cross the CRIT reservation and thus would require an easement. Alternative Segments cb-01, cb-02, cb-04, cb-05, and cb-06 would not be consistent with the La Paz County Zoning Plan, which would be a moderate effect on the land use goals of La Paz County.

The only segments in the Copper Bottom Zone that would cross Arizona state trust land are Segments i-06 and i-07, which would cross 1.7 and 1.3 miles of Arizona state trust land, respectively. The crossings would occur through the middle of some Arizona state trust land parcels and along section or Arizona state trust land parcel boundaries in other parcels. Where Segment i-06 or i-07 would not cross Arizona state trust land along section or Arizona state trust land parcel boundaries, the Project may limit the future sale or lease of these parcels to other developers by the ASLD. This would be a moderate, long-term impact to future ASLD management decisions associated with the affected parcels. The only residential land is contained within Segment i-07.

Residential
The analysis area for Proposed Segment p-07 and Alternative Segment i-07 are the only analysis areas that contain residential land in the Copper Bottom Zone. Impacts to residential land would be the same as those described in Section 4.8.4.1.

Agricultural
There would not be any impacts to NRCS-classified land in the Copper Bottom Zone. Impacts to agricultural land would be the same as those described in Section 4.8.4.1.

Military
Proposed Segment p-09 would cross a small portion of the northeast corner of the YPG. No Project structures would be constructed on the YPG. There would be negligible impacts on the YPG designated land uses and mission in this location.

4.8.4.5 Colorado River and California Zone

<u>Direct and Indirect Effects Common to All Segments in the Zone</u>

Land Use Authorizations and Rights-of-Way
Although the majority of the analysis area in the Colorado River and California Zone is private land, BLM-administered land in the Colorado River and California Zone falls under the management of the Yuma RMP and the CDCA Plan. The CDCA Plan requires that new transmission lines be within a DFA (per the DRECP) or a designated utility corridor. All Proposed and Alternative Segments would be within a DFA (Appendix 1, Figure 3.11-1c) per the CDCA Plan and therefore would comply with the CDCA Plan. Additionally, approximately 80 percent of the Proposed Action and Alternative Segments on BLM-administered land would be within designated utility corridors.

The land use analysis area in the Colorado River and California Zone would include the Colorado River special policy area designated under the Palo Verde Valley Area Plan. This plan includes a land use concept that is intended to preserve the agricultural character of the analysis area. The presence of the Project would change a negligible amount of the agricultural character of the analysis area.

Residential
There are 224 residential parcels on 2,441 acres in the land use analysis area in the Colorado River and California Zone, which is a higher residential density than other zones (average of 11 acres per parcel in the Colorado River to California Zone versus an average of 48 acres per parcel in the East Plains and Kofa and Quartzsite zones [Sections 4.8.4.2 and 4.8.4.3]). This residential land is

approximately 13 percent of the analysis area and has a higher residential density than other zones. This is a minor amount of the analysis area. Impacts to residential uses would be the same as those described in Section 4.8.4.1.

Agricultural
The majority of the Colorado River and California Zone is agricultural. The primarily agricultural land use in this zone differs substantially from the primarily undeveloped and range land uses in the other zones. Impacts to agricultural uses would be the same as those described in Section 4.8.4.1.

Industrial
The land use study area in the Colorado River and California Zone would include the existing NextEra Energy Blythe solar energy and McCoy Solar Energy facility and the approved but not yet constructed Blythe Mesa Solar Project. In addition to the approved projects, First Solar Energy Desert Quartzite Solar Project and the Recurrent Energy Crimson Solar Project are pending applications within the land use study area. Construction of the Project may interfere with construction of these facilities or maintenance of existing facilities; these would be short-term, minor effects. Further, construction of the Project could generate dust that would require additional cleaning of the existing solar facility panels beyond normal maintenance; this would be a short-term, minor effect.

<u>Direct and Indirect Segment-specifics Effects</u>

Land Use Authorizations and Rights-of-Way
All segments, where located on BLM-administered land, would be consistent with the applicable RMP and CDCA Plan. Segments p-15e, cb-10, and i-08s would cross between 0.1 mile (i-08s) and 1.3 mile (p-15e) of Arizona state trust land. The crossings would occur through the middle of some Arizona state trust land parcels and along section or Arizona state trust land parcel boundaries in other parcels. Where a segment would not cross Arizona state trust land along section or Arizona state trust land parcel boundaries, the Project may limit the future sale or lease of these parcels to other developers by the ASLD. This would be a moderate, long-term impact to future ASLD management decisions associated with the affected parcels. Segments p-15w and x-11 would also cross California state land (both 0.1 mile and associated with the submerged lands of the Colorado River). This would have a negligible effect on CSLC management of California state land in the Colorado River and California Zone.

Residential
The study areas for Proposed Segment p-15w and Alternative Segments ca-01 and ca-05 contain the majority (23, 21, and 27%, respectively) of the residential land in the Colorado River and California Zone land use study area. Impacts to residential uses would be the same as those described in Section 4.8.4.1.

Agricultural
The Proposed Segments would temporarily affect 141 acres (121 acres in California) and permanently remove up to 39 acres (34 acres in California) of agricultural land in the Colorado River and California Zone, which could include NRCS-classified lands or Williamson Act lands. This would be a permanent loss of less than 1 percent of the agricultural land or NRCS-classified lands or Williamson Act lands in the zone which would be a negligible effect.

Although the Colorado River and California Zone includes the most NRCS-classified farmland of any zone, Segments p-15w, ca-01, and ca-05 contain the most NRCS-classified prime farmland and farmland of statewide importance. These segments also include a substantial acreage of Williamson Act lands. Impacts to agricultural uses would be the same as those described in Section 4.8.4.1.

Industrial
Proposed Segment p-18 and Alternative Segments ca-06, ca-07, and ca-09, and x-19 would occur within or adjacent to existing or approved but not yet constructed solar energy facilities.

4.8.5 Operations, Maintenance, and Decommissioning

4.8.5.1 Land Use Plan Compliance

The analysis area is located within several Federal, state, and local planning areas. Table 4.8-2 outlines the plans that are applicable within the analysis area, land use goals and objectives therein, and the compliance of the Project with land use goals, objectives, and/or policy associated with these plans.

Table 4.8-2 Land Use Compliance with Relevant Land Use Plans

PLAN	GOALS/OBJECTIVES/POLICY	COMPLIANCE DETERMINATION
BLM Yuma RMP	The YFO has identified eight utility corridors in its planning area. New major ROWs and utility facilities should be located in designated ROW corridors, unless an evaluation of the project demonstrates location outside of a designated corridor is the only practicable alternative. The BLM has stated that the Project ROW must be in designated corridors or would be out of compliance with the RMP.	Several segments would be out of compliance with the ROW requirements of the Yuma RMP and would require an RMP amendment (Section 4.8.5.2). Several segments would not conform with designated VRM classes (Section 4.18.7.1) and would require an RMP amendment (Section 4.8.5.2).
BLM Bradshaw-Harquahala RMP	The Hassayampa Field Office has identified utility corridors as a specific land use allocation and has listed the types of projects for which utility corridors may be designated. To minimize impacts on BLM-administered land, new infrastructure should be within these designated corridors. The BLM has the authority to designate new utility corridors for facilities that fall within one of three categories (including electric transmission); however, other land uses, such as avoiding sensitive or special resources, must be taken into consideration.	The Project would be consistent with the Bradshaw-Harquahala RMP.

PLAN	GOALS/OBJECTIVES/POLICY	COMPLIANCE DETERMINATION
BLM Lower Sonoran RMP	The Lower Sonoran Field Office has identified utility corridors as a specific land use allocation in which all compatible major linear utilities will be allowed. The RMP states that linear facilities may be authorized outside of the utility corridor if they are due and necessary and connecting a generating facility to the closest designated utility corridor.	The Project would be consistent with the Lower Sonoran RMP.
BLM Lake Havasu RMP	The Lake Havasu Field Office has identified utility corridors as a land use authorization pursuant to Title 5 of the FLPMA. Uses authorized by a ROW issued under Title 5 may include power lines. The Lake Havasu Field Office has identified 12 utility corridors in its planning area that are either existing corridors or additional/revised corridors tying together existing corridors. To minimize impacts and the proliferation of separate ROWs on BLM-administered land, new infrastructure should be within these identified corridors.	One Alternative Segment would not conform with designated VRM classes (Section 4.18.7.1) and would require an RMP amendment (Section 4.8.5.2).
Kofa National Wildlife Refuge and Wilderness…Interagency Management Plan	Within the Interagency Management Plan, shared land uses are described, which include designated utility corridors. To grant use of a ROW, the USFWS would need to find the use appropriate for the refuge based on the conditions in chapter 603 FW 1 of the USFWS Fish and Wildlife Service Manual and would also need to conduct a compatibility determination if the use is found appropriate.	The Project was found to not be an appropriate use on the Kofa NWR (USFWS 2017).
CDCA Plan of 1980, as amended	The Project would fall within a development focus area (DFA) identified in the CDCA Plan. In addition to being pre-screened and allowed for development, projects in DFAs benefit from consistent and predictable mitigation requirements identified in the DRECP and can take advantage of the database of resource data collected as part of the DRECP. New projects must comply with applicable CMAs in the CDCA Plan.	The Project would be consistent with this plan and all CMAs that would apply to the Project, except for LUPA-BIO-PLANT-2 (Appendix 2C). An amendment to the CDCA Plan would be required for all California segments to be in compliance (Section 4.8.5.2).
Maricopa County Comprehensive Plan	The plan does not specifically discuss regulations or policies for transmission lines or other utilities; however, the plan includes a Land Use Policy that states, “Maricopa County supports land use buffers and compatible land use strategies near existing and future high voltage electric utility line corridors.” This Land Use Policy points toward the use of corridors for transmission lines.	The Project would be consistent with this plan.

PLAN	GOALS/OBJECTIVES/POLICY	COMPLIANCE DETERMINATION
Tonopah/Arlington Area Plan	This area plan does not designate specific corridors for utility infrastructure or provide detail on how transmission line infrastructure should occur.	The Project would be consistent with this plan.
La Paz County Zoning Plan	Although the plan does not expressly identify utility corridors for transmission infrastructure, it states that "[a]ny new industrial development should be located along a major arterial corridor, rail connection, [or] state highway, or in close proximity to the Interstate corridor."	The Proposed Action and Alternative Segments, where they occur along the DPV1 or I-10, would be consistent with this plan. Alternative segments outside of these areas would not be consistent with this plan.
Riverside County General Plan	The plan objectives include ensuring that development and conservation land uses do not infringe on existing essential public facilities and public utility corridors, taking into consideration utility easements and linear ROWs in land development and conservation proposal reviews, and avoiding crossing ridge tops to avoid bird collisions.	The Project would be consistent with this Plan.
Riverside County Palo Verde Area Plan	This area plan does not define land specifically for the use of utility infrastructure; however, it is intended to be consistent with the Riverside County General Plan, the City of Blythe General Plan, and the City of Blythe Colorado River Corridor Plan.	The Project would be consistent with this Plan.
Town of Quartzsite General Plan	One of the goals of this plan is to promote an efficient land use development pattern where utility infrastructure is available. Although the plan does not identify particular corridors for utilities, the strategy supporting this goal is to coordinate infrastructure improvement with existing and projected development activity and, therefore, place utilities in areas that are beneficial to the community and complement the plan.	The Alternative Segments that cross existing development, e.g., the La Posa LTVA, Dome Rock 14-Day Camping Area, or a Tier III growth area, would not be consistent with this plan. This plan does not apply to the Proposed Action segments because they are outside its planning boundary.
City of Blythe General Plan 2025	Although specific corridors are not identified for utility infrastructure in this plan, the guiding policies indicate the city's intent to protect existing uses (e.g., agriculture, recreation, sensitive habitats) and minimize conflicts between urban and open space uses by requiring buffers and greenbelts.	The Project would be consistent with this Plan.

PLAN	GOALS/OBJECTIVES/POLICY	COMPLIANCE DETERMINATION
City of Blythe Colorado River Corridor Plan	Although this plan does not discuss transmission line corridors or utility ROWs, it is intended to be consistent with the City of Blythe General Plan, and the city would assess placement of these ROWs in the same manner.	The Project would be consistent with this Plan.

4.8.5.2 Land Use Plan Amendments

Yuma RMP

The BLM YFO has stated that all ROWs, for transmission lines greater than 115kV, must be located in a designated utility corridor. The Yuma RMP does not provide for such a utility corridor in all locations where Project segments could be located; therefore, an amendment to the Yuma RMP would be required to grant a, 200-foot ROW for these segments (Table 4.8-3). There are no such segments in the Colorado River and California Zone that would require an amendment to the Yuma RMP to grant the Project ROW.

The acreage of BLM-administered land that would be required for the Project outside of a designated utility corridor where a Yuma RMP amendment would be required is 2,122 acres in aggregate (Table 4.8-3). This would affect less than 0.1 percent of the 1.3 million acres of lands managed under the Yuma RMP. The impact of the RMP amendment to land use is that these additional lands would be open to ROW development.

Table 4.8-3 Segments Requiring Yuma RMP Amendment for ROW Grant

SEGMENT	ZONE	LENGTH BLM	ACRES BLM
i-03	East Plains and Kofa	12.2	295.8
x-01	East Plains and Kofa	1.0	24
x-02b	East Plains and Kofa	0.1	2.4
x-03	East Plains and Kofa	5.6	134.4
x-04	East Plains and Kofa	21.5	521.2
qn-02	Quartzsite	9.8	235.2
qs-01[1]	Quartzsite	3.1	74.4
qs-02[1]	Quartzsite	4.8	115.2
x-05	Quartzsite	10.2	244.8
x-06	Quartzsite	9.2	220.8
cb-01	Copper Bottom	3.2	76.8
cb-02	Copper Bottom	2.2	52.8
cb-04	Copper Bottom	1.7	40.8
cb-05	Copper Bottom	3.9	93.6
cb-06	Copper Bottom	1.3	31.2
TOTAL		**88.4**	**2,121.6**

[1] Only a portion would be outside of a designated corridor; only this portion would require an RMP amendment. The total BLM acreage is included to be conservative.

Some Project segments would be located on BLM-administered land classified as VRM Class II which does not allow the degree of change to the visual landscape that would be associated with the Project. The determination of RMP amendments needed to address VRM non-conformance is described in Section 4.18. An amendment to the Yuma RMP to address VRM non-conformance would not have any effects on land use.

Lake Havasu RMP

A portion of Alternative Segment in-01 crosses VRM Class II designated lands and would not conform to class objectives. An RMP amendment would be required to change the portion of this segment designated VRM Class II to Class IV within the BLM utility corridor crossing VRM Class II lands. The determination of RMP amendments needed to address VRM non-conformance is described in Section 4.18. An amendment to the Lake Havasu RMP to address VRM non-conformance would not have any effects on land use.

CDCA Plan

None of the Proposed or Alternative segments in California would be in compliance with CMA LUPA-BIO-PLANT-2, the intent of which is to protect the ecological process of special status plant species in order to sustain viable, healthy populations. This CMA would apply to Harwood's eriastrum which occurs in the biology study area. This CMA would be further amended in the CDCA Plan to authorize construction of the Project within 0.25-mile of occurrences of Harwood's eriastrum, provided that a Rare Plant Linear ROW Protection Plan for Harwood's eriastrum is developed and approved by the BLM California State Director. The effects of the amendment on Harwood's eriastrum populations is provided in Section 4.5.9.

The amendment to the CDCA Plan to bring the Project into compliance with CMA LUPA-BIO-PLANT-2 would not result in any effects on current land uses in the study area. This amendment would not conflict with any other management direction in the CDCA Plan.

4.8.5.3 Designated Utility Corridors, Land Use Authorizations, and Rights-of-Way

The Project would be authorized on BLM-managed land with a ROW grant containing terms and conditions the holder must comply with to prevent undue and unnecessary degradation, including that the Project will not conflict with any existing authorizations. The terms and conditions would come from DRECP's CMAs (Appendix 2C), applicable Interagency Operating Procedures within the WWEC corridor 30-52, ROW regulation and policy, APMs, and BMPs, as necessary. Further, the designation of the utility corridor is for the use proposed. Thus, there would not be significant impacts to designated utility corridors.

Where necessary to construct transmission facilities across canals or other conveyance systems (e.g., the CAP canal), the Project would be constructed to allow conductors to span these facilities, resulting in low or minimal impacts to the canal or other conveyance systems. An encroachment permit would be required by the managing agency (e.g., Reclamation) to cross these facilities in accordance with Federal and local regulations. Similarly, if the Project was constructed on CRIT land or the YPG, encroachment permits or other permits required by the CRIT or US Army would be required. The Project would across numerous Federal, state, county, and local highways and railroads, electric transmission and delivery lines, and gas and oil pipelines. The exact alignment and design configurations of these crossings would be in accordance with applicable regulations and codes.

4.8.5.4 Residential

The presence and operation of the Project may affect residential land uses in the analysis area by causing noise disturbance related to corona effect (Section 4.12), potentially posing an impact to residents' health related to EMF (Section 4.14), potentially affecting residential property values (Section 4.15), and changing residents' views (Section 4.18). The majority of the land use analysis area is classified as rural residential, indicating that the residential density is low. Micrositing of the Project would allow for avoidance of residential structures.

Although there are currently no proposed or approved, but not yet constructed, residential subdivisions in the land use analysis area, the Project would potentially reduce the desirability of new residential development in areas close to the Project and remove acreage of residential land that could be developed in the future, which would have long term effects. However, in general only residential sites immediately adjacent to the ROW would become less desirable for development, and the amount of residential land that would be removed during the life of the Project would be substantially less than that available in the land use analysis area; therefore, these effects would be minor and long term.

4.8.5.5 Agricultural

The Project would remove agricultural, NRCS-classified farmlands, and Williamson Act farmlands from production during the life of the Project but would not preclude agricultural uses. During Project operations, croplands occupied by Project facilities would no longer be available for crop production. The economic effects on agriculture are provided in Section 4.15. The impacts to prime farmlands would be the same as during construction, and would occur within, not in addition to, the construction disturbance area. These effects would be long term, but minor because the actual acreage of prime farmlands affected would be substantially less than that available in the analysis area.

Aerial crop spraying would be affected by the presence of Project structures and lines; to avoid potential collision hazards, some parts of agricultural fields might not be treatable using aerial spraying due to safety concerns. Although there are currently no center-pivot irrigation systems in the land use irrigation analysis area, crop production that involves other types of mechanical irrigation, automated farming methods, or farming equipment with large spans (up to 100 feet) could also be adversely affected by the placement of overhead conductors and support structures. Micrositing the transmission line should allow the Project to avoid crossing most fields with these features and reduce the potential for this type of disruption. If crossing a field is necessary, structures would be placed on the outside edges of the field or parallel to the rows, and diagonal field crossings would be avoided where possible.

4.8.5.6 Military

Approximately 1,000 feet of Copper Bottom segment p-09 would cross the very northeast corner of the YPG. There would not be any structures or Project construction facilities on the YPG; the Project would span this area. Periodic Project maintenance or unscheduled/emergency maintenance may require use of new or existing roads on the YPG to access the Project, which may conflict with military vehicles. Because there would not be any structures on the YPG and only a very small portion would span the YPG, this would be a negligible to minor effect on the YPG. Additionally, new access roads associated with the Project could increase the potential for OHV trespass on the YPG, which would be a negligible to minor, long-term effect on the mission of the YPG because of the limited area affected. Sections 4.10 and 4.14 provide further information regarding impacts to the YPG related to OHVs.

The EMF associated with the Project could cause interference with YPG military radio frequencies. This impact is described in Section 4.14.5.3 and 4.14.11.

4.8.5.7 Industrial

Colorado River to California Segments p-18, ca-06, ca-07, ca-09, and x-19 would cross or be adjacent to solar energy facilities. For segments that would cross an existing solar facility, the Project structures would be sited to avoid all solar energy facility components. However, the Project would have the potential to affect the performance of the solar array, due to shading from the Project structures. Micrositing of the poles, as well as pole type selection, would reduce the potential for this effect. Therefore, this would be a negligible to minor effect on solar energy facilities in the Colorado River and California Zone.

The presence of the Project would not physically conflict with other present or planned industrial facilities. The presence of the Project may change the micrositing necessary for the approved but not yet constructed solar energy facilities. This would be a minor effect on these facilities. The location of the Project within a DFA (Appendix 1, Figure 3.11-1c) would reduce the overall acreage available for future energy production facilities in the planning area. This would be a negligible effect on the acreage available for these future facilities.

4.8.6 Mitigation Measures

There are no MMs identified for land use for any of the specific segments and thus, no MMs have been identified for any of the full route alternatives or subalternatives described below. The applicant has committed to APMs, and the BLM developed required BMPs, that would further reduce impacts to land use.

4.8.7 Construction of Full Route Alternative and Subalternative Effects

4.8.7.1 Proposed Action

Segment p-06 was determined to not be an appropriate use on the Kofa NWR (USFWS 2017); therefore, the USFWS would not issue approval for a ROW for Segment p-06. Except for impacts to ASLD-management of Arizona state trust lands, there would be negligible impacts to land use under the Proposed Action. Proposed segments that would not cross Arizona state trust lands along section or Arizona state trust land parcel boundaries may limit the future sale or lease of these parcels to other developers by the ASLD.

RMP Amendments

No amendment to the Yuma RMP would be necessary to grant the Project ROW under the Proposed Action, as all proposed segments would be within designated corridors.

The Proposed segments in California would not be in compliance with the CDCA Plan (CMA LUPA-BIO-PLANT-2); therefore, an amendment to the CDCA Plan would be necessary for the Project to be in compliance with CMA LUPA-BIO-PLANT-2.

4.8.7.2 Alternative 1: I-10 Route

Alternative 1 would avoid the Kofa NWR and the YPG, would cross through more Arizona state trust land, would affect more residential land and NRCS-classified farmland in California, and would affect more solar energy facilities. Alternative 1 would not be consistent with the Town of Quartzsite General Plan (Table 4.8-1) where the alternative passes through the Dome Rock 14-Day Camping Area within the Quartzsite planning area (Section 3.10.4.2), and portions of it would not be consistent with the La Paz County Zoning Plan. Overall, besides avoiding the Kofa NWR and YPG Alternative 1 would have greater impacts to land use (as described in Sections 4.8.4.1 and 4.8.5) than the Proposed Action.

RMP Amendments

Unlike the Proposed Action, a Yuma RMP amendment would be necessary prior to granting the Project ROW under Alternative 1, because three Alternative segments would not be within a designated corridor. As under the Proposed Action, the Proposed and Alternative segments in California would not be in compliance with the CDCA Plan (CMA LUPA-BIO-PLANT-2); therefore, an amendment to the CDCA Plan would be necessary for the Project to be in compliance with CMA LUPA-BIO-PLANT-2.

Subalternatives to Alternative 1 (1A through 1E)

One segment under Alternative 1 would require a Yuma RMP amendment for a ROW under Subalternatives 1A and 1B. Subalternative 1C would include a route portion that crosses VRM Class II designated lands in the Lake Havasu FO. An RMP amendment would be required to change the portion of this segment designated VRM Class II to Class IV within the BLM utility corridor.

4.8.7.3 Alternative 2: BLM Utility Corridor Route

Alternative 2 would avoid the Kofa NWR. Alternative 2 would not be consistent with the La Paz County Zoning Plan (Table 4.8-2) where the alternative would not occur along the DPV1 or I-10 in the La Paz County planning area, and would not be consistent with the Town of Quartzsite General Plan (Table 4.8-2) where the alternative passes through the La Posa LTVA and Dome Rock 14-Day Camping Area within the Quartzsite planning area (Section 3.10.4.2), and portions of it would not be consistent with the La Paz County Zoning Plan. Alternative 2 would affect more solar energy facility than the Proposed Action. Overall, besides avoiding the Kofa NWR and YPG Alternative 2 would have greater impacts to land use (as described in Sections 4.8.4.1 and 4.8.5) than the Proposed Action.

RMP Amendment Effects

Unlike the Proposed Action, a Yuma RMP amendment would be necessary to grant the ROW under Alternative 2, because two Alternative segments would not be within a designated corridor. As under the Proposed Action, the Proposed and Alternative segments in California would not be in compliance with the CDCA Plan (CMA LUPA-BIO-PLANT-2); therefore, an amendment to the CDCA Plan would be necessary for the Project to be in compliance with CMA LUPA-BIO-PLANT-2.

Subalternatives to Alternative 2 (2A through 2E)

Under Subalternative 2A, the route would pass through an area classified as a low known sensitivity area which indicates it does not undermine proposed allocations. Subalternative 2A would also include more NRCS-classified farmland in California. Under Subalternatives 2A and 2B, one additional segment than under Alternative 2 would require an RMP amendment prior to granting the Project ROW and under Subalternative 2C three additional segments than under Alternative 2 would require an RMP amendment to grant a ROW. The impacts under Subalternatives 2D and 2E would not differ from Alternative 2.

4.8.7.4 Alternative 3: Avoidance Route

Alternative 3 would avoid the Kofa NWR. Alternative 3 would not be consistent with the La Paz County Zoning Plan where the alternative would not occur along the DPV1 or I-10 in the La Paz County planning area (Table 4.8-2). Alternative 3 would affect more NRCS-classified farmland and more solar energy facility than the Proposed Action. Overall, besides avoiding the Kofa NWR Alternative 3 would have greater impacts to land use (as described in Sections 4.8.4.1 and 4.8.5) than the Proposed Action.

RMP Amendments

Unlike the Proposed Action, a Yuma RMP amendment would be necessary to grant the ROW under Alternative 3, because five alternative segments would not be within a designated corridor. As under the Proposed Action, the Proposed and Alternative segments in California would not be in compliance with the CDCA Plan (CMA LUPA-BIO-PLANT-2); therefore, an amendment to the CDCA Plan would be necessary for the Project to be in compliance with CMA LUPA-BIO-PLANT-2.

Subalternatives to Alternative 3 (3A through 3M)

Table 4.8-4 summarizes the differences in land use effects and plan consistency between the Alternative 3 subalternatives (3A through 3M) and Alternative 3.

Table 4.8-4 Comparison of Subalternatives with Alternative 3

SUBALT.	ZONE	DIFFERENCES FROM ALTERNATIVE 3
3A	East Plains and Kofa	Route would pass through an area classified as a low known sensitivity area which indicates it does not undermine proposed allocations. This subalternative would cross more Arizona state trust land and more NRCS-classified farmland than Alternative 3. One additional segment than under Alternative 3 would require an RMP amendment for a ROW.
3B	East Plains and Kofa	This subalternative would cross more Arizona state trust land than Alternative 3.
3C	East Plains and Kofa	This subalternative would cross less Arizona state trust land than Alternative 3. One less segment than under Alternative 3 would require an RMP amendment for a ROW.
3D	East Plains and Kofa	This Subalternative would include a route portion that crosses VRM Class II designated lands in the Lake Havasu FO. An RMP amendment would be required to change the portion of this segment designated VRM Class II to Class IV within the BLM utility corridor.
3E	Quartzsite	Route would go through the La Posa LTVA, which would not be consistent with the Town of Quartzsite General Plan.
3F	Quartzsite	None
3G	Quartzsite	None
3H	Quartzsite	Route would cross a Tier III growth area, which is identified for growth beyond 2035. One additional segment than under Alternative 3 would require an RMP amendment for a ROW.
3J	Quartzsite	None
3K	Copper Bottom	None

4.8.7.5 Alternative 4: Public Lands Emphasis Route

Alternative 4 would not cross the Kofa NWR. Alternative 4 would not be consistent with the La Paz County Zoning Plan where the alternative would not occur along the DPV1 or I-10 in the La Paz County planning area (Table 4.8-2). Alternative 4 would affect more NRCS-classified farmland and more solar energy facility than the Proposed Action. Overall, besides avoiding the Kofa NWR Alternative 4 would have greater impacts to land use (as described in Sections 4.8.4.1 and 4.8.5) than the Proposed Action.

RMP Amendments

Unlike the Proposed Action, a Yuma RMP amendment would be necessary to grant the ROW under Alternative 4, because five Alternative segments would not be within a designated corridor.

As under the Proposed Action, the Proposed and Alternative segments in California would not be in compliance with the CDCA Plan (CMA LUPA-BIO-PLANT-2); therefore, an amendment to the CDCA Plan would be necessary for the Project to be in compliance with CMA LUPA-BIO-PLANT-2. Alternative 4 would include a route portion that crosses VRM Class II designated lands in the Lake Havasu FO. An RMP amendment would be required to change the portion of this segment designated VRM Class II to Class IV within the BLM utility corridor.

Subalternatives to Alternative 4 (4A through 4P)

Subalternative 4B would cross more Arizona state trust land than Alternative 4 and Subalternative 4M would cross more NRCS-classified farmland than Alternative 4. One additional segment than under Alternative 4 would require an RMP amendment prior to granting a ROW under Subalternatives 4B and 4D.

4.8.8 Residual Impacts

There would not be any mitigation for land use; therefore, there would not be any residual impacts.

4.8.9 CDCA Plan Compliance

CMA LUPA-LANDS-8 would apply to the Project; all new transmission lines of 161kV or greater must be located in a designated utility corridor unless it would be located within a DFA (Appendix 2C). Because all Proposed and Alternative segments would be located within a DFA (Appendix 1, Figure 3.11-1c), the Project would be in compliance with this CMA.

Except for CMA LUPA-BIO-PLANT-2, the Project would be in compliance with all of the CMAs in the CDCA Plan that apply to the Project (Appendix 2C). CDCA Plan compliance with CMA LUPA-BIO-PLANT-2 would be achieved through BMP-BIO-31 (Section 4.5.9; (Appendix 2A, Section 2A.4)).

4.8.10 Unavoidable Adverse Effects

The potential effect on performance of solar energy facilities in the Blythe area would be a negligible to minor, unavoidable adverse effect.

4.8.11 Cumulative Effects

The past and present land uses in the CEA (Table 3.20-4a) have had a direct effect on the conversion of lands from one use to another (i.e., undeveloped land that is converted to a power plant, transmission line ROW, solar energy facility, etc.). Land in the CEA located east of the Colorado River and outside designated ROWs is largely undeveloped and is characterized by vacant desert, agricultural lands, and by areas used for grazing, transportation corridors, utilities, recreation, and widely dispersed, low-density residential development.

Past development has increased human use of land in the CEA. However, because of the limited availability of water east of the Colorado River, human development in that portion of the CEA has been limited to small scattered towns and cities and various isolated or linear projects such as the Ehrenberg Wash Pit and Plomosa Mine Quarry, the El Paso Natural Gas pipeline, and transmission lines, among large tracts of undeveloped land.

Reasonably foreseeable actions in the CEA that, when combined with the Project, may have cumulative land use effects include solar energy facilities, a power plant, and mines (Table 4.3-2). The overall cumulative impact of these developments is generally consistent with the long-term management planning tools such as BLM RMPs and numerous state, county, and municipal-level long-range planning documents.

The Project would have moderate, short-term cumulative impacts to the management of lands and future or planned land uses since the Project would limit non-compatible future or planned land uses such as other transmission lines, pipelines, or renewable energy development from being located within the same footprint as the Project. This would also be true for other similar projects provided in Table 3.20-5 since they would also limit other projects from being located in the same footprint. As development occurs, the rural environment would become increasingly more residential, commercial, and industrial; however, the limited availability of water would limit expansive future residential, commercial, and water-dependent industrial development, as it has in the past.

Currently, 43,977 acres or 6.2 percent of the CEA is under agricultural use, the majority of which is in California (Section 4.8.10.1). Potential construction of projects identified in Table 3.20-6 and quantified in Table 4.3-2 would cumulatively add to the loss of NRCS-classified farmland, especially in the California portion of the land use and agriculture CEA. Additionally, construction of transmission lines associated with power plants and solar energy facilities has resulted and future projects will result in effects to farming operations, such as mechanical irrigation and crop spraying in the CEA.

Increasing the transmission line infrastructure may contribute to the likelihood of future solar development, and when considered cumulatively with the Project, would further limit the availability of lands available for farming/agriculture resulting in an incremental impact to farms. Like the Project, these projects would likely avoid directly impacting existing active farmlands by converting them to non-agricultural land uses. However, development of these projects, in combination with past and present actions, would result in the conversion of areas classified by the NRCS as farmland into non-farmable land, creating a long-term adverse cumulative impact by reducing the amount of available farmable land. The cumulative impact on farmland would be considered minor because of the extensive amount of land currently available for farming and the relatively small portion of farmland that existing development plus the Project and reasonably foreseeable future actions would remove; however, the cumulative impact would be long-term since it could take years for the farmlands to return to pre-developed conditions, even with reclamation.

In general, an increase in development would contribute to changes in land use and the modification of the character of the CEA. As development occurs, the rural environment would become increasingly more residential, commercial, and industrial. If populations increase as a result of development, the use of designated recreation areas and dispersed recreation within the CEA also could increase. The cumulative effects of past, present, and reasonably foreseeable projects to land use would be minor to moderate, although this Project would contribute only negligibly to this overall cumulative effect.

Cumulative impacts to recreational land uses and visual resources are presented in their respective sections, Sections 4.10.10 and 4.18.10.

4.8.11.1 Zone-Specific Cumulative Effects

East Plains and Kofa Zone

Past and present developments and disturbances related to land use were presented in Section 3.20. The majority of land in the CEA is currently undeveloped with open desert and wilderness areas (Appendix 1, Figure 3.8-1). The land in the East Plains and Kofa Zone CEA would be incrementally affected by the minor cumulative effect on land use by the Project when combined with multiple transmission lines, industrial facilities, and I-10.

As presented in Table 3.20-4a, within the East Plains and Kofa Zone CEA, there are 742.0 acres of agricultural lands or 0.2 percent of the East Plains and Kofa Zone CEA. Agricultural and NRCS-classified farmlands within the East Plains and Kofa zone CEA have likely been removed from crop production from previous residential, commercial, and industrial development, and additional agricultural and NRCS-classified farmlands may be removed through development of facilities such as the Harquahala Solar Project. This cumulative removal of agricultural land from production as a result of the Project would be minor.

Quartzsite Zone

Of the 74,297 acres within the Quartzsite Zone portion of the CEA, the majority of land is currently undeveloped with open desert and recreation areas (Appendix 1, Figure 3.8-1). About 68,410 acres or 92.1 percent of the land is under BLM jurisdiction (Table 3.20-3a). Other lands include 4,206 acres of private lands (5.7 percent), 1,279 acres of USFWS lands (1.7 percent), and 401 acres of state trust lands (0.5 percent). Land uses include the Town of Quartzsite, the El Paso natural gas pipeline, I-10, La Posa LTVA, and DPV1. There are no agricultural lands within the Quartzsite Zone CEA. Reasonably foreseeable future projects in the Quartzsite Zone include the Plomosa 9 Placer Claim mine and the Quartzsite Wastewater Treatment Plant expansion/renovation. The Quartzsite Wastewater Treatment Plant project would be within its current footprint so itself would not contribute to cumulative changes to land use. In conjunction with past, present, and reasonably foreseeable future projects, cumulative impacts from the Project to land use would be negligible.

Copper Bottom Zone

There are 88,502 acres within the Copper Bottom Zone portion of the CEA (Table 3.20-3a). This includes 49,862 acres of BLM-administered land (56.3 percent), 8,878 acres of Reclamation-administered lands (10 percent), 14,618 acres of military lands (16.5 percent), 8,718 acres of CRIT reservation (9.9 percent), 4,535 acres of state trust lands (5.1 percent), 15.5 acres of county land (<0.1 percent) and 1,876 acres of private lands (2.1 percent). There are no agricultural lands within the Copper Bottom Zone CEA (Table 3.20-4a).

Colorado River and California Zone

There are 96,490 acres within the Colorado River and California Zone portion of the CEA (Table 3.20-3a). This includes 25,333 acres of BLM-administered land (26.3 percent), 2,350 acres of Reclamation-administered lands (2.4 percent), 2,579 acres of Arizona state trust lands (2.7

percent), 49.6 acres of California state lands (<0.1 percent), and 66,178 acres of private lands (68.3 percent). As presented in Table 3.20-4a, within the Colorado River and California Zone portion of the CEA, there are 46,575.6 acres of agricultural lands or 48.3 percent of the Colorado River and California Zone CEA.

Construction of multiple projects within this portion of the CEA could create a substantial adverse cumulative effect to surrounding land and realty uses if the projects were built on or adjacent to areas with planned land and realty uses or with existing easements of ROW.

It is unknown whether reasonably foreseeable future projects would require amendments to the CDCA Plan. The amendment to the CDCA Plan to bring this Project into compliance with CMA LUPA-BIO-PLANT-2 would not result in any effects on current land uses in the study area; therefore, it would not contribute to cumulative effects.

4.8.12 Irreversible and Irretrievable Commitment of Resources

There would not be an irreversible commitment of land use resulting from the Project. Land use allocations and encumbrances could be reversed if the Project and associated facilities were removed in the future.

There would be an irreversible loss of minimal acreage of productive farmland where impacts to this resource cannot be avoided. Loss of some rangeland would also occur, but the reduction in grazing acreage available would have a negligible overall impact on stocking rates. The temporary disturbance to farmlands would not be considered an irretrievable loss.

4.8.13 Relationship of Short-term Uses and Long-term Productivity

Short-term effects on land uses in the analysis area would result if a ROW were granted for the Project and the subsequent encumbrance of the lands involved any other uses such as recreational use. These short-term effects would only occur in areas where construction activities for the transmission structures or ancillary facilities physically occupy the ROW. Long-term impacts to land use would be expected for the areas in which the physical occupation of the transmission line structures, access roads, and SCS would preclude recreational use and grazing activities; future removal of the transmission line and ancillary facilities at the end of the life of the Project would not preclude land use form reverting to previous uses or to be converted to new uses, as allowed under managing land use plans.

Impacts to recreational use would result from construction activities and physical, permanent occupancy of the transmission structures and ancillary facilities. Long-term losses in the productivity of recreational resources would not be expected, since recreational opportunity would be restored with rehabilitation of the ROW at the end of the life of the Project.

Projects are subject to the Farmland Protection Policy Act requirements if they may irreversibly convert farmland (directly or indirectly) to nonagricultural use. Short-term effects on farmlands would result if laydown areas were located in active agricultural areas with permission to lease the land from the landowner. However, these impacts would be minimal because laydown areas would be largely or entirely selected to be located on previously disturbed areas. Any laydown areas that are not able to be located on previously disturbed areas would revert back to productive agriculture following termination of construction activities.

No irreversible loss of temporarily disturbed prime or unique farmlands would be expected to occur since these lands are more easily rehabilitated by planting and irrigation.

4.9 GRAZING AND RANGELAND

4.9.1 Introduction

Potential impacts to grazing and rangeland are discussed in terms of AUMs, land availability, and degradation of lands.

4.9.2 Methods for Analysis

4.9.2.1 Analysis Area

The analysis area for direct effects to grazing and rangeland includes a 4,000-foot corridor encompassing the Project. Because there is some flexibility in final siting of the temporary use areas (construction), Project structures, and SCS, this analysis area will include all potential disturbance areas along with areas where indirect effects could occur.

4.9.2.2 Assumptions

The following assumptions were made when performing the analysis of Project effects on grazing and rangeland:

- There is an average of 0.04 AUMs per acre in the analysis area (Table 3.9-1);
- The average AUMs per acre on ASLD lease grazing lands and the BLM Cibola-Trigo HMA is the same as the BLM grazing allotments.

4.9.2.3 Environmental Effects Indicators, Magnitude, and Duration

Effects to grazing and rangeland would occur as a result of:

- Changes in access or disturbance to livestock or existing range improvement facilities;
- Loss of rangeland relative to changes in AUMs;
- Fragmentation of grazing allotments due to Project facilities; or
- Substantial degradation in range quality resulting from introduction or increased spread of noxious weeds per EO 13112 – Invasive Weed Species.

Effects to grazing and rangeland may be negligible, minor, moderate, or major, and may have durations that are qualified as temporary, short term, or long term (Table 4.9-1, Section 4.1).

Table 4.9-1 Grazing and Rangelands Effect Magnitude and Duration Definitions

ATTRIBUTE OF EFFECT		DESCRIPTION SPECIFIC TO RECREATION
Magnitude	Negligible	Very little effect on grazing or rangelands such that the effect would not be perceptible to a human observer or user. Less than 5 percent of the grazing allotment would be affected.
	Minor	An effect that changes less than 10 percent of grazing or rangelands. More than 5 percent but less than 10 percent of the grazing allotment would be affected.
	Moderate	An effect that changes 10 to 25 percent of grazing or rangelands. More than 10 percent but less than 25 percent of the total land use or grazing allotment would be affected.
	Major	An effect that changes more than 25 percent of a land use. Action would not be in compliance with land management plans and zoning and would not conflict with existing ROWs or other authorized uses. More than 25 percent of the grazing allotment would be affected.
Duration	Temporary	Limited to active construction or decommissioning.
	Short-term	10 years or less.
	Long-term	More than 10 years.

4.9.3 No Action Alternative

Under the No Action Alternative, no ROW would be granted for the Project and the transmission line, SCS, and ancillary facilities would not be constructed. The BLM-administered land on which the Project is proposed would continue to be managed as it currently exists. Lands in the analysis area would remain as is, which is primarily undeveloped desert land available for grazing, subject to existing availability or restrictions. Current grazing and rangeland practices in the analysis area described in Section 3.9 would continue under the No Action Alternative. There would be no changes that would alter existing grazing or rangelands beyond current conditions.

4.9.4 Construction of Action Alternative Segments

4.9.4.1 Direct and Indirect Effects Common to All Action Alternatives

Construction activities could have minor effects on livestock and WHB access to grazing, and seasonal movement of herds by causing temporary fragmentation of grazing allotments, ASLD lease lands, or the Cibola-Trigo HMA. Construction activities involving helicopters could displace livestock and WHB grazing in the area and affect forage vegetation with fugitive dust. In addition, disturbance within grazing allotments would cause a negligible reduction in the forage available in the allotment until revegetation is successful on disturbance sites. Degradation of forage by noxious weed encroachment during construction would be prevented by implementation of the Noxious Weed Management Plan (Appendix 2B, Section 2B.11).

Construction could have minor effects on rangeland improvements, such as pasture fencing, corrals, stock tanks, and pipelines. The minor effects to rangeland improvements would only occur where there currently is no physical access to the ROW. Effects to fences would be minimized by installing temporary gates to prevent livestock from escaping pastures and accessing roadways.

Fences and gates would be repaired or replaced to their original, pre-disturbed condition, as required by the landowner or the land manager if they are damaged or destroyed by construction activities. The final siting of the transmission line structures would avoid other improvements such as corrals and stock tanks; therefore, there would be no direct effect to rangeland improvements.

4.9.4.2 East Plains and Kofa Zone

Direct and Indirect Effects Common to All Segments in the Zone

Construction of the Project in the East Plains and Kofa Zone could temporarily affect 1,366 acres of BLM grazing allotments or ASLD lease grazing lands, and 55 AUMs of forage could be temporarily unavailable. This could be approximately 1 percent of the BLM grazing allotments or ASLD lease grazing lands and 1 percent of the AUMs in the East Plains and Kofa Zone study area, which would be negligible overall, but there may be a minor, temporary impact on individual permittees locally if construction occurs within their permitted lease area/pasture. The acreage and AUMs lost during operations and maintenance would be substantially less, therefore effects to rangeland and AUMs in the East Plains and Kofa Zone will not be discussed further.

Direct and Indirect Segment-specific Effects

There are two active permitted stock tanks within the analysis area for Segment p-01 (Beacon Tank and Moore Tank), one within the analysis area for Segment d-01 (Gasline Tank), one within the analysis area for Segment i-01 (Dry Corral), and one within the analysis area for Segment x-01 (Yuma Tank). It is unknown whether construction would preclude or hinder livestock access to these stock tanks. However, given the limited availability of water if construction of the Project impeded livestock access to these stock tanks it would be a moderate, temporary effect on grazing and rangelands. If construction would preclude or hinder livestock access to these stockponds or other livestock water access, DCRT would provide a suitable alternative livestock water source during construction (MM-GR-01) (Section 4.9.6). This would reduce this effect to negligible.

4.9.4.3 Quartzsite Zone

Direct and Indirect Effects Common to All Segments in the Zone

Construction of the Project in the Quartzsite Zone could temporarily affect 537 acres of the Cibola-Trigo HMA and 21 AUMs of forage could be temporarily unavailable. This could be approximately <1 percent of the HMA and <1 percent of the AUMs in the East Plains and Kofa Zone study area, which would be negligible. Therefore, effects to the HMA and AUMs in the Quartzsite Zone will not be discussed further.

Direct and Indirect Segment-specific Effects

There are no important or unique grazing or rangeland characteristics associated with any of the segments in the Quartzsite Zone.

4.9.4.4 Copper Bottom Zone

Direct and Indirect Effects Common to All Segments in the Zone

There are no BLM grazing allotments in the Copper Bottom Zone, and no range improvements. However, there is 1,623 acres of ASLD-lease grazing lands and 29,729 acres of the Cibola-Trigo HMA in the Copper Bottom Zone. Construction of the Project in the Copper Bottom Zone could temporarily affect 719 acres of ASLD lease grazing lands or the Cibola-Trigo HMA and 29 AUMs of forage could be temporarily unavailable. This could be approximately 2 percent of the ASLD lease grazing lands or Cibola-Trigo HMA and 2 percent of the AUMs in the Copper Bottom analysis area, which would be negligible. Therefore, effects to AUMs in the Copper Bottom Zone will not be discussed further.

Direct and Indirect Segment-specific Effects

Helicopter fly yards would be located within Segments p-09, p-10, p-11, and cb-01/cb-02, which include over 1,796 acres of the Cibola-Trigo herd area and HMA. This activity would disturb WHB and livestock and fugitive dust could affect grazing forage in the vicinity of the fly yards. While grazing animals would likely leave the area during helicopter activity, they would return following the conclusion of construction and restoration of rangeland. The Erosion, Dust, and Air Quality Plan would include information about the reduction of dust emissions generated from helicopter use. Therefore, these effects would be negligible to minor and short term.

4.9.4.5 Colorado River and California Zone

Direct and Indirect Effects Common to All Segments in the Zone

There are no BLM grazing allotments or HMA within the Colorado River and California Zone analysis area. Therefore, there would not be any effects to grazing and rangelands.

Direct and Indirect Segment-specifics Effects

There are no important or unique grazing or rangeland characteristics associated with any of the segments in the Colorado River and California Zone.

4.9.5 Operations, Maintenance, and Decommissioning

During Project operations, rangeland and pasture occupied by support structures, the SCS, or access roads would not be available for grazing. Maintenance activities would be unlikely to affect grazing and rangelands. Post-operations decommissioning of the transmission line would cause similar levels of disturbance and disruption as construction. However, once successful reclamation is complete, areas would be restored to the prior range condition.

The estimated acres of the grazing and rangelands analysis area that would be permanently affected by the Project would be less than those temporarily affected by construction; therefore, the effects to grazing and rangelands during operations, maintenance, and decommissioning would also be negligible.

4.9.6 Mitigation Measures

The following MM has been identified:

MM-GR-01: If construction would preclude or hinder livestock access to these stockponds or other livestock water sources, DCRT would provide a suitable alternate livestock water source during construction.

The applicant has committed to APMs, and the BLM developed required BMPs that would further reduce impacts to grazing and rangeland.

4.9.7 Construction of Full Route Alternative and Subalternative Effects

4.9.7.1 Proposed Action

Measurable effects to grazing and rangeland would include those related to two stock tanks (Beacon Tank and Moore Tank) that could result if construction of Segment p-01 impeded livestock access to these stock tanks; this would be a moderate, temporary effect on grazing and rangelands under the Proposed Action (Section 4.9.4.2). MM-GR-01 would reduce this effect to negligible. Also, the use of helicopter fly yards would be a negligible to minor impact on grazing within the Cibola-Trigo herd area and HMA.

4.9.7.2 Alternative 1: I-10 Route

The measurable effects to stockwater access would be greater than those under the Proposed Action, because in addition to the two stock tanks associated with Segment p-01, construction of Alternative 1 could impede livestock access to a stock tank associated with Segment i-01 (Dry Corral) (Section 4.9.4.2). However, there would not be any helicopter fly yards under Alternative 1, and therefore no measurable effect to grazing on the Cibola-Trigo herd area and HMA.

<u>Subalternatives to Alternative 1 (1A through 1E)</u>

The grazing and rangeland effects of Subalternatives 1A and 1B would differ from those of Alternative 1; the effects under Subalternatives 1C through 1E would not differ from those of Alternative 1. Under both Subalternative 1A and 1B, the replacement of Segment i-01 would eliminate the effects associated with the Dry Corral stock tank. However, under Subalternative 1B the construction of Segment x-01 instead could affect the Yuma Tank (Section 4.9.4.2). MM-GR-01 would reduce this effect to negligible.

4.9.7.3 Alternative 2: BLM Utility Corridor Route

The effects to grazing and rangelands of Alternative 2 would be similar to those under the Proposed Action.

<u>Subalternatives to Alternative 2 (2A through 2E)</u>

The grazing and rangeland effects of Subalternatives 2A and 2B would differ from those of Alternative 2; the effects of Subalternatives 2C through 2E would not differ from those of Alternative 2. Under both Subalternatives 2A and 2B, the replacement of Segment i-01 would eliminate the effects associated with the Dry Corral stock tank. Additionally, under Subalternative 2A replacement of Segment p-01 would also eliminate the effects associated with the Beacon and Moore Tanks.

4.9.7.4 Alternative 3: Avoidance Route

The effects to grazing and rangelands under Alternative 3 would be similar to those under the Proposed Action.

Subalternatives to Alternative 3 (3A through 3M)

The grazing and rangeland effects of Subalternatives 3A, 3B, and 3L would differ from those of Alternative 3 (Table 4.9-2).

Table 4.9-2 Comparison of Subalternatives with Alternative 3

SUBALT.	ZONE	DIFFERENCES FROM ALTERNATIVE 3
3A	East Plains and Kofa	The replacement of Segment p-01 would eliminate the effects associated with the Beacon and Moore stock tanks, but construction of Segment d-01 instead could affect the Gasline Tank (Section 4.9.4.2).
3B	East Plains and Kofa	Would add the effects related to the Dry Corral stock tank (Segment i-01) (Section 4.9.4.2). MM-GR-01 would reduce this effect to negligible.
3C	East Plains and Kofa	None
3D	East Plains and Kofa	None
3E	Quartzsite	None
3F	Quartzsite	None
3G	Quartzsite	None
3H	Quartzsite	None
3J	Quartzsite	None
3K	Copper Bottom	None
3L	Copper Bottom	There would not be any helicopter fly yards, and therefore no measurable impacts to grazing on the Cibola-Trigo herd area or HMA.
3M	Colorado River and California	None

4.9.7.5 Alternative 4: Public Lands Emphasis Route

The only measurable effects that differ from the Proposed Action would be those related to the Gasline Tank that could result if construction of Segment d-01 impeded livestock access to this stock tank; this would be a moderate, temporary effect on grazing and rangelands under the Proposed Action (Section 4.9.4.2). MM-GR-01 would reduce this effect to negligible.

Subalternatives to Alternative 4

The only subalternative that would differ from Alternative 4 would be Subalternative 4A. The replacement of Segment d-01 would eliminate the effects associated with the Gasline Tank, but construction of Segment p-01 instead could affect the Beacon and Moore stock tanks (Section 4.9.4.2). MM-GR-01 would reduce this effect to negligible.

4.9.8 Residual Effects

The implementation of MM-GR-01 would reduce the effect of the construction of the Project on livestock access to water from moderate to negligible.

4.9.9 CDCA Plan Compliance

There are no CMAs related to grazing and rangeland that would apply to the Project.

4.9.10 Unavoidable Adverse Effects

There would not be any unavoidable adverse effects to grazing and rangelands.

4.9.11 Cumulative Effects

Of the 711,570.7 acres within the CEA (Table 3.20-3a), 395,687.3 acres or 55.6 percent are under BLM management and are potentially available for grazing. In addition, the majority of the 62,138.7 acres of Arizona state trust lands in the CEA are likely leased for grazing (Section 3.9.3). The Project and other reasonably foreseeable actions in the analysis area have the potential to result in cumulative impacts to rangelands by removing forage habitat from lands permitted for grazing. Increasing the transmission line infrastructure may contribute to the likelihood of future solar development, and when considered cumulatively with the Project, would further limit the availability of lands available for grazing. The development of the Project and projects identified in Tables 3.20-5 and 3.20-6 would also remove areas from active grazing and create a long-term adverse cumulative impact on available rangeland, potentially resulting in a reduction in grazing leases. The cumulative impact to rangeland would be considered minor because of the extensive amount of land currently available for grazing and the relatively small portion of grazing habitat that existing development plus the Project and reasonably foreseeable future actions would remove; however, the cumulative impact would be long term since it could take years for the rangelands to return to pre-developed conditions, even with reclamation.

Reasonably foreseeable projects, as discussed above under Land Use, would result in further changes to the vegetation communities that are used as forage for cattle grazing in the CEA. State trust lands sold or leased for developments would no longer be available for grazing. Commercial development would result in the removal of vegetation communities and forage. Further, construction of roads and freeways would result in the removal and transformation of native vegetation communities to roadways, with a mixture of urban and native vegetation reclamation in the ROWs.

The reasonably foreseeable projects presented in Table 3.20-6 represent an additional 20,596 acres of disturbance within the land use CEA (Table 4.3-2). The Project would convert an additional 136 to 276 acres (Table 4.3-1) of land from generally open desert to utility ROW depending upon the Action Alternative selected. This would represent 3.4 percent of the CEA when combined with the reasonably foreseeable projects. This would further reduce the amount of open space in which to graze cattle.

4.9.11.1 Zone-Specific Cumulative Effects

East Plains and Kofa Zone

During construction of any of the linear RFFPs, grazing activities would be disrupted but would resume after reclamation activities. These projects would cumulatively remove a small amount of grazing lands in comparison to the grazing lands available in the East Plains and Kofa Zone CEA. Larger projects, such as solar facilities, specifically the 5,935-acre La Paz County land conveyance, would permanently remove lands from grazing. In conjunction with past and present projects, cumulative impacts from the Project and reasonably foreseeable future projects to grazing would be negligible to minor.

Quartzsite Zone

Reasonably foreseeable future projects in the Quartzsite Zone include the Plomosa 9 Placer Claim mine and the Quartzsite Wastewater Treatment Plant expansion/renovation. The Quartzsite Wastewater Treatment Plant project would be within its current footprint so itself would not contribute to cumulative changes to grazing. The Plomosa 9 Placer Claim would remove 20 acres of land from potential grazing. In conjunction with past and present projects, cumulative impacts from the Project and reasonably foreseeable future projects to grazing would be negligible.

Copper Bottom Zone

Reasonably foreseeable future projects in the Copper Bottom Zone include the West Port Gold mine. The West Port Gold project would remove 40 acres of land from potential grazing. In conjunction with past and present projects, cumulative impacts from the Project and reasonably foreseeable future projects to grazing would be negligible.

Colorado River and California Zone

There is a limited amount of grazing in this zone, as there are no grazing leases in the California portion. The reasonably foreseeable future projects in this zone, not including the Project, include a power plant and three large scale solar facilities totaling 14,601 acres (Table 4.3-2), more than half of which would be on BLM-administered land (Table 3.20-6). In conjunction with past and present projects, cumulative impacts from the Project and reasonably foreseeable future projects to grazing would be negligible.

4.9.12 Irreversible and Irretrievable Commitment of Resources

Loss of some rangeland would occur, but the reduction in grazing acreage available would have a negligible overall impact on stocking rates. The temporary disturbance to rangelands would not be considered an irretrievable loss.

4.9.13 Relationship of Short-term Uses and Long-term Productivity

Impacts to range resources would result from construction activities and physical, permanent occupancy of the transmission structures and ancillary facilities. Long-term losses in the productivity of range resources would not be expected, since forage would be restored with rehabilitation of the ROW at the end of the life of the Project.

Short-term effects on rangelands would result from laydown areas, since these locations would need fencing to prohibit access from livestock during construction. However, these impacts would be minimal because laydown areas would be largely or entirely selected to be located on previously disturbed areas. As such, these areas would provide little or no forage, and would not represent a reduction in forage. Any laydown areas that are not able to be located on previously disturbed areas would revert back to productive rangelands following termination of construction activities.

The Project would result in long-term losses of rangeland productivity where SCS, roads, and other permanent disturbance would occur. Rehabilitation of the temporary rangeland disturbances in the ROW would be completed, but due to low precipitation and semi-arid conditions in the region, these areas may not be available in the short term for livestock grazing.

4.10 RECREATION

4.10.1 Introduction

Effects to recreation resources are discussed in terms of recreation opportunities and activities, recreation settings, desired recreation experiences, and adjacent recreation areas.

4.10.2 Methods for Analysis

4.10.2.1 Analysis Area

The analysis area for recreation would include all potential disturbance areas along with all portions of the study area where indirect effects could occur.

4.10.2.2 Assumptions

The following assumption was made when performing the analysis of Project effects on recreation:

- OHV routes in Johnson Canyon would need to be closed for the duration of Project construction except for Alternative 1.

4.10.2.3 Environmental Effect Indicators, Magnitude, and Duration

Effects to recreational resources would occur as a result of:

- Project-related changes that alter or otherwise physically affect established, designated, or planned recreation areas, resources, experiences, or activities;

- Increased demand for recreation activities due to the influx of people during construction and operation that would exceed capacity for that activity in a given area such as a campground, wilderness, or hunting area and/or trails;
- Conflicts with applicable Federal, state, or local recreation policies;
- Conflicts with established recreational areas;
- Decreased accessibility to areas established, designated, or planned for recreation;
- An activity that would result in incompatibility as defined by the ROS;
- An activity that would result in new recreation experiences and opportunities;
- An activity that would result in an effect to existing recreational OHV designations/routes, which results in the activity being incompatible with OHV designations (open, closed, closed except for administrative use, etc.) and/or OHV routes;
- Prevents long-term recreational use or use during peak season or impedes or discourages existing recreational activities;
- Increases the use of neighborhood and regional recreational facilities such that the physical deterioration of the facilities would be substantial or accelerated;
- Include recreation facilities or require the construction or expansion of recreation facilities that might have an adverse physical effect on the environment; or
- Physically degrade existing recreation resources.

Effects to recreation may be negligible, minor, moderate, or major, and may have durations that are qualified as temporary, short term, or long term (Table 4.10-1, Section 4.1).

Table 4.10-1 Recreation Effect Magnitude and Duration Definitions

ATTRIBUTE OF EFFECT		DESCRIPTION SPECIFIC TO RECREATION
Magnitude	Negligible	Very little effect on recreation such that although there may be slight modifications to access or a change in the quality of the recreation experience, most users would not be aware of these changes.
	Minor	Some effect on recreation such that although there may be modifications to access or a change in the quality of the recreation experience, users that notice it would not change how they use the recreation resource.
	Moderate	An effect on recreation such that modifications to access or a change in the quality of the recreation experience would be noticeable to most users and a user may change how they use the recreation resource.
	Major	An effect on recreation such that modifications to access or a change in the quality of the recreation experience would be noticeable to all users and would result in the loss of the recreation resource.

ATTRIBUTE OF EFFECT		DESCRIPTION SPECIFIC TO RECREATION
Duration	Temporary	Limited to active construction or decommissioning.
	Short-term	10 years or less.
	Long-term	More than 10 years.

4.10.3 No Action Alternative

Under the No Action Alternative, no ROW would be granted for the Project and the transmission line, SCS, and ancillary facilities would not be constructed. The BLM-administered land on which the Project is proposed would continue to be managed as it currently exists. Lands in the analysis area would remain as is, which is primarily undeveloped desert land available for dispersed and developed recreation, subject to existing closures or restrictions. Current recreational use (recreation opportunities and activities, recreation settings, desired recreation experiences, and adjacent recreation areas) in the analysis area described in Section 3.10 would continue under the No Action Alternative. There would be no changes that would alter existing recreation opportunities and activities, settings, desired experiences, or adjacent recreation areas in the analysis area beyond current conditions and recreation trends.

4.10.4 Construction of Action Alternative Segments

4.10.4.1 Direct and Indirect Effects Common to All Action Alternatives

Recreation Opportunities/Activities

Potential construction related effects would be localized, short-term, and negligible to moderate. Construction of the Project would not permanently preclude the use of or access to any existing recreation opportunities or activities, but some temporary effects to these resources would occur during the construction phases of the Project. Dispersed recreation activities such as hiking, camping, nature viewing, rock climbing, rockhounding, hunting, or OHV use would be temporarily affected as construction noises, visual disturbances, vehicle and equipment travel, and/or the presence of other humans within approximately 1 mile of a recreation area or opportunity could detract from these recreation opportunities and activities. Recreation users that seek opportunities for solitude commonly seek areas where they would be less likely to see other humans. Access to developed and dispersed recreation areas may be temporarily precluded, restricted, or more cumbersome during active construction. Although not all the BLM-administered land within the analysis area have been classified with ROS settings, these effects during construction may be temporarily incompatible with the activities, settings, motivations, and benefits associated with the ROS setting of those areas that are ROS-classified.

As described in Appendix 2A, Section 2A.7, temporary signs directing vehicles to alternative park access and parking would be posted in the event construction temporarily obstructs parking areas near trailheads (BMP-REC-01, BMP-REC-02). Temporary signs advising recreation users of construction activities and directing them to alternative recreation routes, as appropriate, would be posted on both sides of all recreation route intersections or as determined through DCRT coordination with the respective jurisdictional agencies. This may cause adjacent recreation areas unaffected by the construction, whether developed and/or available for dispersed recreation, to become temporarily more crowded while construction in the area is active. For example, those wishing to camp in an area affected by the construction would be more likely to concentrate in campsites unaffected by construction, causing those areas to be more crowded than they might normally be. This would be a short-term, moderate effect on other recreation areas that due to its short duration would not lead to an accelerated deterioration of these areas.

A schedule of construction activities would be posted near entrances to recreational areas as well as the Project website. Signs would be installed near access roads notifying the public of construction activities in the area, as well as to the eventual presence of permanent Project facilities (BMP-REC-01, BMP-REC-02; Appendix 2A, Section 2A.7).

Hunting

The construction of the Project would have localized, minor, and temporary effects on hunting. The AGFD and CDFW would post signs in accordance with their laws and regulations for hunting to indicate the ROW would be closed to hunting during construction activities for the protection of hunters, construction workers, and equipment. However, the actual ROW of the Project represents a small portion of the affected GMUs in Arizona and hunting zones in California, and the overall access for hunting within the affected GMUs and hunting zones would be maintained. There could be site-specific and localized minor effects to individual hunters during construction if their preferred access is temporarily closed or restricted during construction. This effect would not extend to hunting overall, but could represent an obstacle to an individual hunter's preferred access to a particular area.

In addition, human presence and construction activities would likely cause some wildlife species to temporarily avoid these areas (Section 4.5); therefore, the availability of game species may be temporarily affected in active construction areas. Following construction activities, the area would return to existing conditions, wildlife would likely no longer avoid the areas, and effects to hunting would cease.

Off-Highway Vehicles

Construction effects to OHV users would be similar to those described for recreation opportunities/activities, above. OHV users may be temporarily affected by construction noises, visual disturbances, vehicle and equipment travel, and/or the presence of construction workers. Access to designated OHV routes may be temporarily precluded, restricted, or more cumbersome during active construction. As described for Recreation Opportunities/Activities above, BMP-REC-01 and BMP-REC-02 (Appendix 2A) would inform OHV riders of alternative parking areas and OHV routes.

The recreation experience may be affected for some OHV users, in particular those that were familiar with the area prior to construction of the Project. Some unauthorized OHV use could occur during construction when workers are not present (such as on weekends or in between construction phases).

4.10.4.2 East Plains and Kofa Zone

Direct and Indirect Effects Common to All Segments in the Zone

Recreation Areas and ROS

The quality of recreation and some recreation access on the Kofa NWR would be affected by construction activities associated with the proposed route. However, there is a substantial area of the Kofa NWR outside of the ROW on which recreation would not be affected; therefore, the effect on recreation within the Kofa NWR would be negligible. Further, because the portion of the Project on the Kofa NWR would be parallel to the existing DPV1, the long-term effects on recreation would be negligible. The New Water Mountains WA would not be affected by the Project, because nearly all the available recreation access to the New Water Mountains WA is outside of the ROW, and the ROW would not be within this WA.

There would be temporary, minor effects to recreation access to the Big Horn WA (and by extension the Hummingbird Springs WA that adjoins it to the north) during construction of the proposed route. However, the Project ROW would not be on the Big Horn Wilderness WA; therefore, there would be negligible effects to this WA during operations.

There would be construction effects within the ROW to the Yuma East Undeveloped, La Posa Destination, and Plomosa SRMAs; however, there is substantial area of these SRMAs outside of the ROW such that the effects to these SRMAs would be localized, negligible to minor, and temporary. Along the Proposed Action segments, the long-term presence of the Project would have negligible effects on the SRMAs due to the existing presence of the DPV1, and the Project would be compatible with the ROS designation(s) for these recreation areas. Along the Alternate segments, where there is no other transmission line, the effect would be minor. If the Project was constructed on a portion of these recreation areas that was designated as Semi-Primitive, it would be incompatible with the ROS designation which would be a long-term, moderate effect.

Hunting

The affected GMUs would include GMUs 41, 42, 43A, 44A, 44B, 45A, and 45B. Less than 1 percent of any one of these GMUs would be affected by construction of the Project in the segments within this zone, which would be a negligible effect on the GMUs. During operation and maintenance of the Project, the effects to GMUs would be less than those during construction, therefore also a negligible effect.

OHV Routes and the Arizona Peace Trail

The effects to OHV routes in the East Plains and Kofa Zone would be the same as those described in Section 4.10.4.1. There would be a minor, long-term increase in the chance for illegal OHV activity in the East Plains and Kofa Zone. Table 4.10-2 summarizes the miles of OHV routes that would be present within 0.5-mile of each segment in the East Plains and Kofa Zone. The recreation effects on users on the proposed Arizona Peace Trail in the East Plains and Kofa Zone would be minor to moderate.

Table 4.10-2 East Plains and Kofa Zone OHV Routes Effects

ZONE SEGMENT	OHV ROUTE WITHIN 0.5-MI	APT[1] WITHIN 0.5-MI
p-01	0.0	0.0
p-02	1.0	0.0
p-03	3.7	0.0
p-04	17.8	0.0
p-05	4.9	0.0
p-06	52.0	1.1
d-01	16.9	0.0
i-01	0.2	0.0
i-02	2.2	0.0
i-03	17.4	0.9
i-04	29.2	0.0
in-01	53.7	0.0
x-01	2.0	0.0
x-02a	0.1	0.0
x-02b	4.4	0.0
x-03	12.4	0.0
x-04	37.8	0.9
TOTAL	255.7	2.9

[1] Arizona Peace Trail

Direct and Indirect Segment-specific Effects

Recreation Areas and ROS
Segments p-03 through p-06 would affect recreation access on the Kofa NWR, Big Horn Mountains WA, and two SRMAs; however, these effects would be negligible.

With the exception of Segments x-01, i-01, and i-02, all other segments within this zone would affect recreation access to two SRMAs; however, these effects would be negligible.

Hunting
Segments p-01 and p-06 would affect substantially more acreage of GMUs than the other Proposed segments in the East Plains to Kofa Zone (636 acres and 866 acres, respectively). These two segments would also affect a greater number of individual GMUs than the other Proposed segments in this zone (three and four GMUs, respectively). Further, Segment p-06 would cross the Kofa NWR, which is a unique hunting opportunity. Segments p-02 and p-05 would affect the least acreage of GMUs (27 acres and 49 acres, respectively).

Alternative Segments d-01, x-04, and i-03 would affect the most acreage of GMUs (613, 550, and 485 acres, respectively). These three segments would affect approximately the same number of GMUs as the other Alternative segments in the East Plains to Kofa Zone. Alternative Segments x-02a, i-02, and x-02b would affect the least acreage of GMUs (80 acres, 81 acres, and 84 acres, respectively).

OHV Routes and the Arizona Peace Trail
Segment p-06 has substantially more OHV routes located within 0.5-mile of the proposed route (52.0 miles) than the other Proposed segments, and the most proposed Arizona Peace Trail (1.1 miles). Therefore, this segment would affect the recreation experience on more OHV routes than the other Proposed segments in the East Plains and Kofa Zone and would also have the potential for the most increase in illegal OHV use. The ROW would include none or very little OHV routes or proposed Arizona Peace Trail for Segments p-01 or p-02.

Segment in-01 has the greatest amount of OHV routes located with 0.5-mile of the Alternative segments (53.7 miles). Segments i-03 and x-04 have the most amount of proposed Arizona Peace Trail (0.9-mile each). Therefore, these Alternative segments would affect the recreation experience on more OHV routes than the other Alternative segments in the East Plains and Kofa Zone and would also have the potential for the most increase in illegal OHV use. There would be heavy OHV use in the immediate vicinity of Segment i-04 and this segment would include guyed structures; an unacceptable level of impact to OHV rider safety could occur from guys extending from guyed V structures in areas of heavy OHV use. Therefore, structures along Segment i-04 would be replaced by either self-supported lattice structures or monopoles (MM-REC-02; Section 4.10.6). The ROW would include none or very little OHV routes or proposed Arizona Peace Trail for Segments i-01 and x-02a.

4.10.4.3 Quartzsite Zone

Direct and Indirect Effects Common to All Segments in the Zone

Recreation Areas and ROS
Camping would be specifically affected in the Quartzsite Zone by the Alternative segments. The La Posa LTVA and the Dome Rock Camping Area would be crossed by several Alternative segments, and other segments would be adjacent to the La Posa LTVA. There would be localized, minor to moderate temporary effects to camper access into these areas during construction of the Project, and the recreational experience may be affected due to the noise, dust, and equipment activity associated with construction. After construction, the presence of the Project within the Dome Rock Camping Area would be a major, long-term effect for some campers using this recreation area. The Project would bisect the Dome Rock Camping Area and due to the relatively small size of the area (2,215 acres) the Project would be a substantial feature which could affect the camping and recreation experience for users.

The effect to the La Posa LTVA from segments crossing this area would be moderate and long term. Recreational residents of LTVAs would experience visual effects of the Project for longer time periods than transient recreationalists (Section 4.18). The type of effects would be similar to those for the Dome Rock Camping Area. La Posa LTVA is approximately five times larger than the Dome Rock Camping Area, so access would be less affected and the presence of the Project would be less of a substantial feature. Conversely, recreational residents of LTVAs would experience visual effects of the Project for longer time periods than transient recreationalists (Section 4.18).

At both camping areas, sites further from the Project may be more desirable, which could change camping patterns on the areas and concentrate use in portions farther from the Project. Greater deterioration of these portions of the recreation areas may occur due to the concentrated use. This would be a minor to moderate, long-term effect on these camping areas. The Project would be compatible with the designated ROS of both areas.

The effects to SRMAs in the Quartzsite Zone would be similar to those in the East Plains and Kofa Zone (Section 4.10.4.2). A small portion of the Dripping Springs ACEC and the Kofa NWR would be within the analysis area and outside the ROW for Segment x-05; however, they are unlikely to be affected by the Project.

Hunting
The affected GMUs would include GMUs 43A and 44B. Less than 1 percent of either of these GMUs would be affected by the Project which would be a negligible effect on the GMUs. During operation and maintenance of the Project, the effects to GMUs would be less than those during construction, therefore also a negligible effect.

OHV Routes and the Arizona Peace Trail
The effects to OHV routes in the Quartzsite Zone would be the same as those described in Section 4.10.4.1. There would be a minor, long-term increase in the chance for illegal OHV activity in the Quartzsite Zone. Table 4.10-3 summarizes the miles of OHV routes that would be present within 0.5-mile of each segment in the Quartzsite Zone. All of the proposed Arizona Peace Trail within 0.5-mile of the Project would be in undeveloped areas. The recreation effects on users on the proposed Arizona Peace Trail in the Quartzsite Zone would be minor to moderate.

Table 4.10-3 Quartzsite Zone OHV Routes Effects

ZONE SEGMENT	OHV ROUTE WITHIN 0.5-MI	APT[1] WITHIN 0.5-MI
p-07	9.2	0.0
p-08	5.2	0.0
i-05	10.0	0.0
qn-01	2.5	0.0
qn-02	24.6	1.2
qs-01	2.8	2.6
qs-02	14.1	1.9
x-05	19.0	0.0
x-06	10.3	0.0
x-07	8.2	1.7
TOTAL	105.9	7.4

[1] Arizona Peace Trail

Direct and Indirect Segment-specific Effects

Recreation Areas and ROS

Segments qn-02, qs-01, qs-02, and x-07 would have substantially more effects to recreation areas in the Quartzsite Zone than the other Alternative segments. All of these segments would cross both camping areas (La Posa LTVA and Dome Rock Camping Areas).

Hunting

The effects to hunting from the segments in the Quartzsite Zone would be similar to each other.

Segments qn-02, x-05, and x-07 would affect the most acreage of GMUs (263, 249, and 188 acres, respectively). These three segments would affect approximately the same number of GMUs as the other Alternative segments in the Quartzsite Zone. Segment qn-01 would affect the least acreage of GMU (15 acres).

OHV Routes and the Arizona Peace Trail

Both Segments p-07 and p-08 have a substantial amount of OHV routes located within 0.5-mile, but there is no proposed Arizona Peace Trail within 0.5-mile of either segment in the Quartzsite Zone. These segments would have the potential for an increase in illegal OHV use.

Segment qn-02 has the greatest amount of OHV routes located with 0.5-mile of the Alternative segments (24.6 miles). Alternative Segments qs-01 and qs-02 have the most amount of proposed Arizona Peace Trail (2.6 and 1.9 miles, respectively). Therefore, these segments would affect the recreation experience on more OHV routes than the other Alternative segments in the Quartzsite Zone, and would also have the potential for the most increase in illegal OHV use.

There would be heavy OHV use in the immediate vicinity of Segments p-07, p-08, i-06, qn-02, qs-02, x-05, x-06, and x-07 and these segments would include guyed structures; an unacceptable level of impact to OHV rider safety could occur from guys extending from guyed V structures in areas of heavy OHV use. Therefore, structures along these segments would be replaced by either self-supported lattice structures or monopoles (MM-REC-02; Section 4.10.6).

4.10.4.4 Copper Bottom Zone

Direct and Indirect Effects Common to All Segments in the Zone

Recreation Areas and ROS

There would be construction effects within the ROW to the La Posa Destination, Plomosa, and Colorado River Corridor Destination SRMAs; the effects these areas would be similar to those described for SRMAs in the East Plains and Kofa Zone (Section 4.10.4.2).

Also, a substantial portion of the Dome Rock Camping Area would be bisected by Segment i-06. The impacts to the Dome Rock Camping Area would be similar to those described for the Quartzsite Zone (Section 4.10.4.3). A small portion of the Quechan Marina Park would be within the analysis area and outside the ROW for Segment i-07; however, it is unlikely to be affected by the Project.

Hunting

GMU 43A would be the only GMU affected in the Copper Bottom Zone. Less than 1 percent of this GMU would be affected by the Project which would be a negligible effect on the GMU. During operation and maintenance of the Project, the effects to the GMU would be less than those during construction, therefore also a negligible effect.

OHV Routes and the Arizona Peace Trail

The effects to OHV routes in the Copper Bottom Zone would be the same as those described in Section 4.10.4.1, except there would be additional effects to OHV routes and the Arizona Peace Trail during construction. Construction of the Project in Johnson Canyon would require the temporary closure of all OHV routes, including the proposed Arizona Peace Trail, through the canyon to ensure safety. OHV travel through Johnson Canyon is a popular recreation pursuit because of its pristine qualities and technical challenges that are unique to the area (Stantec 2016a; Section 4.10). Although the closure of this portion of the proposed Arizona Peace Trail and of other Johnson Canyon OHV routes during construction would be temporary, it would be a moderate effect on OHV recreation. MM-REC-02 would reduce this to a minor effect.

Table 4.10-4 summarizes the miles of OHV routes that would be present within 0.5-mile of each segment in the Copper Bottom Zone. There is 0.5-mile of the proposed Arizona Peace Trail within the ROW of all segments in the Copper Bottom Zone, including Johnson Canyon (Section 3.10.4.3). The recreation effects on users on the proposed Arizona Peace Trail in the Copper Bottom Zone would be minor to moderate.

Table 4.10-4 Copper Bottom Zone OHV Routes Effects

ZONE SEGMENT	OHV ROUTE WITHIN 0.5-MI	APT[1] WITHIN 0.5-MI
p-09	19.9	2.1
p-10	5.7	2.2
p-11	7.8	1.3
p-12	6.7	2.8
p-13	5.6	4.2
p-14	1.0	0.0
cb-01	4.7	1.3
cb-02	4.9	2.5
cb-03	7.8	1.1
cb-04	5.0	0.8
cb-05	4.6	1.4
cb-06	4.2	1.2
i-06	17.4	0.0
i-07	14.3	0.0
x-08	2.4	0.0

ZONE SEGMENT	OHV ROUTE WITHIN 0.5-MI	APT[1] WITHIN 0.5-MI
TOTAL	112.0	20.9

[1] Arizona Peace Trail

Direct and Indirect Segment-specific Effects

The following sections only identify distinguishing characteristics associated with specific segments in the Copper Bottom Zone. If a specific segment is not identified, it should be assumed that the general effects described in Section 4.10.4.1 for recreation resources would occur.

Recreation Areas and ROS
The effects to recreation areas from the proposed segments in the Copper Bottom Zone would be similar to each other.

Segment i-06 would have substantially more effect on recreation areas in the Copper Bottom Zone than the other Alternative segments. This segment would bisect the Dome Rock Camping Area. Additionally, helicopter fly yards would be located within Segments p-09, p-10, p-11, and cb-01/cb-02. The recreation experience for some users within the La Posa and Colorado River Corridor SRMAs in the vicinity of the fly yards may be affected due to the presence and noise of helicopter activity and fugitive dust. The Erosion, Dust, and Air Quality Plan would include information about the reduction of dust emissions generated from helicopter use. This would be a negligible to minor short-term effect to recreation within these SRMAs on these segments.

Hunting
The effects to hunting from the Proposed and Alternative Segments in the Copper Bottom Zone would be similar to each other.

OHV Routes and the Arizona Peace Trail
Segment p-09 has substantially more OHV route located within 0.5-mile of the proposed route (19.9 miles) than the other Proposed segments, but Segment p-13 has substantially more proposed Arizona Peace Trail within 0.5-mile of the proposed route in the Quartzsite Zone than the other Proposed segments. Proposed Segments p-09 and p-13 would affect the recreation experience on more OHV routes more than the other Proposed segments in the Quartzsite Zone, and would also have the potential for the most increase in illegal OHV use. Proposed Segment p-14 would include little OHV route.

Alternative Segments i-06 and i-07 have substantially more OHV routes located within 0.5-mile of the Project than the other Alternative segments in the Copper Bottom Zone. Segment cb-02 has the most amount of proposed Arizona Peace Trail of the Alternative segments. Therefore, these Alternative segments would affect the recreation experience on more OHV routes than the other Alternative segments in the Quartzsite Zone, and would also have the potential for the most increase in illegal OHV use. In addition, Segment cb-02 includes Johnson Canyon, which in addition to having high OHV recreational value, the proposed Arizona Peace Trail and other OHV routes along this segment would be closed temporarily during construction.

There would be heavy OHV use in the immediate vicinity of Segments p-12, cb-04, cb-05, and cb-06 and these segments would include guyed structures; an unacceptable level of impact to OHV rider safety could occur from guys extending from guyed V structures in areas of heavy OHV use. Therefore, structures along these segments would be replaced by either self-supported lattice structures or monopoles (MM-REC-02; Section 4.10.6).

Helicopter fly yards would be located within Segments p-09, p-10, p-11, and cb-01/cb-02. The recreation experience may be decreased in the vicinity of the fly yards for some OHV riders due to the presence and noise of helicopter activity and fugitive dust. The Erosion, Dust, and Air Quality Plan would include information about the reduction of dust emissions generated from helicopter use. This would be a negligible to minor short-term effect on OHV recreation on these segments.

4.10.4.5 Colorado River and California Zone

Direct and Indirect Effects Common to All Segments in the Zone

Recreation Areas and ROS
A small portion of the north end of the Ehrenberg Sandbowl OHV Area would be crossed by Alternative Segment i-08s. This would be a minor, short-term effect during construction and a minor, long-term effect on the Ehrenberg Sandbowl OHV Area; the majority of the area would not be affected by the presence of the Project, but in the portion that it would occur it would be a new, substantial feature on the landscape that could affect the recreation experience of those using this portion of the area. To mitigate effects related to the temporary construction closure of the area, MM-REC-01 would require that construction of the Project occur outside of peak OHV season.

Several small recreation areas would be within the analysis area of the Proposed and Alternative segments, including Quechan Marina Park, the Colorado River Fairgrounds, Miller Park, Goose Flats Wildlife Area, and Jack Marlowe Park. However, based on the distance and proximity of these areas to the ROW there would be negligible effects on these recreation areas.

Hunting
GMU 43A in Arizona and hunting districts in California would be affected in the Colorado River and California Zone. Less than 1 percent of this GMU and the California hunting districts would be affected which would be a negligible effect on these hunting areas. During operation and maintenance of the Project, the effects to the hunting areas would be less than those during construction, therefore also a negligible effect.

OHV Routes and the Arizona Peace Trail
The proposed Arizona Peace Trail is not present in Colorado River and California Zone. The effects to OHV routes in the Colorado River and California Zone would be the same as those described in Section 4.10.4.1. There would be a minor, long-term increase in the chance for illegal OHV activity in the Colorado River and California Zone. Table 4.10-5 summarizes the miles of OHV routes that would be present within 0.5-mile of each segment in the Colorado River and California Zone.

Table 4.10-5 Colorado River and California Zone OHV Routes Effects

ZONE SEGMENT[1]	OHV ROUTE WITHIN 0.5-MI
p-15e	3.2
cb-10	3.0
i-08s	4.7
p-15w	1.0
p-16	3.66
p-17	8.3
p-18	2.6
ca-01	1.0
ca-02	2.7
ca-05	1.0
ca-06	2.5
ca-07	5.0
ca-09	1.0
x-15	5.8
x-16	8.4
x-19	1.1

Direct and Indirect Segment-specific Effects

The following sections only identify distinguishing characteristics associated with specific segments in the Colorado River and California Zone. If a specific segment is not identified, it should be assumed that the general effects described in Section 4.10.4 for recreation resources would occur.

Recreation Areas and ROS
The construction of segments associated with the crossing of the Colorado River would temporarily inhibit boating activity during wire stringing and pulling (Section 2.2.7.2, *Wire Stringing*). These restrictions would be temporary in nature and boat traffic would be allowed to resume after each wire stringing activity was completed. The effect on recreation would be negligible to minor.

Hunting
The effects to hunting from the Proposed segments in the Colorado River and California Zone would be similar to each other.

Alternative Segments ca-01 and ca-05 would affect the most acreage of California hunting district (162 acres and 161 acres, respectively). These two segments would affect the same GMU and hunting districts as the other Alternative segments in the Colorado River and California Zone. Alternative Segment ca-04 would affect the least acreage of GMU (4 acres).

OHV Routes

Proposed Segment p-17 and Alternative Segments x-15 and x-16 would affect the most amount of classified OHV route. Therefore, these segments would affect the recreation experience on more OHV routes than the other segments in the Colorado River and California Zone (as described in Sections 4.10.4.1 and 4.10.5) and would also have the potential for the most increase in illegal OHV use. Proposed Segment p-15w and Alternative Segments ca-01 and ca-05 contain only routes classified as paved.

4.10.5 Operations, Maintenance, and Decommissioning

4.10.5.1 Recreation Opportunities/Activities

The ROW would generally be open to recreation where on public land unless specifically prohibited by the BLM or other regulatory authority (e.g., OHV use). As described in Appendix 2A, Section 2A.7 (APMs and BMPs), plastic mesh or paint would be used to mark guy wires in areas used for recreation. Permanent high visibility guy markers would be installed during construction (BMP-REC-03).

The presence of a transmission line after construction would not be likely to eliminate a recreational use or access to recreation but the quality of, or experience associated with, a recreational use may be altered. In particular, the effect of the Project on segments not already occupied by the DPV1 or other transmission lines would be greater than on segments within existing transmission ROWs. For example, OHV riding in Johnson Canyon is a popular recreation pursuit because of it has pristine qualities and technical challenges that are unique to the area; OHV users in this area may experience more impacts to their recreational experience than in other areas.

Depending on the perception of the decreased quality to an individual – and the extent of familiarity with the area pre- and post-Project – this effect would be negligible to moderate and long term. Effects to the recreation experience related to views of the Project structures are provided in Section 4.18.

Maintenance activities could result in disturbance to recreationists and would be generally limited to vehicular traffic associated with routine inspections of the line and traffic and noise resulting from scheduled or unscheduled maintenance as well as periodic trimming and removal of vegetation. Maintenance or repair activities would occur intermittently over the life of the Project; however, the effects would be temporary as maintenance would occur only once in many months to years and the effects would cease upon completion of the maintenance or repair activity.

4.10.5.2 Hunting

Hunting would be allowed within the ROW but outside of the footprint of the transmission line, SCS, and ancillary facilities, subject to applicable regulations including ARS Title 17, Chapter 3, "Game and Fish", Articles 17-301 and 17-309 A (12) and CCR Title 14, Division 1, Subdivision 2 "Game, Furbearers, Nongame, and Depredators". The Project would create new predatory bird perching opportunities that could increase predation in game birds such as dove, quail, and other upland game birds, which may have a minor, long-term effect on hunting opportunities for these game birds in the area immediately adjacent to the Project. Otherwise, there would be negligible effects to hunting during operations and maintenance. Intentional acts of destruction with firearms (using Project structures for target shooting) is discussed in Section 4.13.

4.10.5.3 Off-Highway Vehicles

Operation and maintenance effects to OHV users would be similar to those described for recreation opportunities/activities, above. In areas not previously occupied by a transmission line, there would be an increased safety risk to OHV users of collision with guy wires and other Project structures (Section 4.14). This would be a minor to moderate effect on the safety risk to OHV users. The operation of the Project in the presence of the current DPV1 or other transmission lines may increase the risk for some users (by increasing the number of guy lines and structures) or decrease the risk for some users (because users are already aware of the safety risk from these features). Using self-supporting lattice structure or monopoles (Section 2.2.3.1) would mitigate this risk to negligible to minor (MM-REC-02; Section 4.10.6).

Following construction activities, the presence of permanent new or widened roads (Section 2.2.8.3) that would be used for operation and maintenance of the Project could change the OHV use patterns in the area, subject to Federal, state, and local OHV and traffic laws and regulations. New access roads constructed for the Project would be signed and would be closed to the public, but illegal OHV use would not be entirely preventable on the new and widened access roads. This would result in an increased chance for user-created route proliferation. An increase in user-created trails would conflict with the BLM's OHV-use strategies, creating management challenges and potentially increasing user conflicts. The resultant effect from increased OHV use would be a minor to moderate effect to recreation opportunities/activities. In the Copper Bottom Zone, this includes the potential for OHV riders to utilize new Project access roads to trespass on the YPG. OHV trespass on the YPG could affect military operations by creating a safety risk for both OHV riders and military personnel operating in the area (Section 4.14.5.1), potentially conflicting with the YPG mission due to the trespass (Section 4.8.2.4), and natural resource goals in the Draft Integrated Natural Resources Management Plan and EA (YPG 2012) (Section 3.8.3.1). Mitigation of locked gates and signage indicating road status would decrease the magnitude of the potential for illegal OHV use or trespass to negligible to minor (MM-REC-01, Section 4.10.6).

Decommissioning and removal of the transmission line upon completion of the Project would result in relinquishing the ROW. Land previously occupied by the ROW and associated transmission line structures would be available for other land uses and the effect to the recreation experience due to the infrastructure would be removed.

4.10.6 Mitigation Measures

The following MMs have been identified for recreation:

MM-REC-01: To mitigate effects related to the temporary construction closure of the proposed Arizona Peace Trail and other OHV routes through Johnson Canyon, MM-REC-01 would require that construction of the Project occur outside of peak OHV season. Construction in Johnson Canyon would occur between the months of July and September when there are fewer recreational users in the area.

MM-REC-02: In areas of high OHV use, such as in Copper Bottom Zone and the Ehrenberg Sandbowl OHV Area, Project tower structures with guy lines would be replaced with self-supporting (no guy lines) lattice structures or monopoles. Additionally, in all other areas where guyed V structures are used, the anchor position would be placed no less than 50 feet from any trail or road, and the lowest guy line would be at least 15 feet above any road or trail crossed by a guy wire. This would reduce the safety risk to OHV users[3].

MM-REC-03: New access roads will be gated where appropriate, and signage including road status will be posted at all new access road junctions. This would preclude and/or minimize recreational use of access roads

In addition, the BLM developed required BMPs that would further reduce impacts to recreation resources (Appendix 2A, Section 2A.7).

4.10.7 Construction of Full Route Alternative and Subalternative Effects

4.10.7.1 Proposed Action

Recreation Areas and ROS

There would be negligible to minor effects to recreation areas under the Proposed Action. The most substantial effect would be related to temporary changes in access to recreation areas. Under the Proposed Action, the long-term effects to recreation would be negligible because of the presence of the existing DPV1; there would be little change to the present condition.

Hunting

There would be negligible effects to hunting under the Proposed Action. The GMUs and hunting districts are large and therefore the temporary effects on a localized portion during construction would have little effect on the ability for individuals to hunt in the GMU or hunting district. In the long-term, the Project would not prevent hunting in the GMU or hunting district, except for within the footprint of the transmission line.

OHV Routes and the Arizona Peace Trail

There would be negligible to moderate effects on OHV routes and the proposed Arizona Peace Trail. The Project would not preclude use of existing OHV routes, but the ROW and associated new or widened access roads may increase illegal OHV use, in particular in portions of the analysis area and ROW with higher current OHV route densities. Because the Proposed Action would

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[3] Utilizing self-supported tangent or dead-end structures would increase the permanent disturbance to soils, wildlife habitat, and other land-dependent resources to 0.06-acre per structure from <0.01 to 0.01-acre per structure for other structure types. The effects of structures on these resources are analyzed in the individual resource sections.

follow the existing DPV1, the Project would have negligible changes on the recreation experience of OHV users on OHV routes and the proposed Arizona Peace Trail.

4.10.7.2 Alternative 1: I-10 Route

Under Alternative 1, the temporary changes in access to recreation areas during construction would be similar to the Proposed Action. However, the long-term effects to recreation quality on recreation areas in all zones except the East Plains and Kofa (where Alternative 1 would be the same as the Proposed Action) would be greater than those under the Proposed Action, because the Project would be a new, substantial feature on the landscape that would change a recreational user's experience from the current condition.

The most substantial difference in recreation effects between Alternative 1 and the Proposed Action is to camping areas in the Quartzsite and Copper Bottom Zones and to the Ehrenberg Sandbowl OHV Area in the Copper Bottom Zone. The La Posa LTVA and the Dome Rock Camping Area would be crossed by several Alternative 1 segments. There would be minor to major effects to these recreation areas under Alternative 1. Also, the north end of the Ehrenberg Sandbowl OHV Area would be crossed by Alternative 1, but it would not be crossed by the Proposed Action. This would be a minor effect on the Ehrenberg Sandbowl OHV Area. The Kofa NWR would not be crossed, thus no impacts to recreation areas or uses in this area would occur.

There would not be any helicopter fly yards under Alternative 1. The other effects to hunting, OHV routes, and the proposed Arizona Peace Trail under Alternative 1 would be the similar to those under the Proposed Action.

<u>Subalternatives to Alternative 1 (1A through 1E)</u>

There would not be any differences in recreation effects between the Alternative 1 subalternatives (1A through 1E) and Alternative 1.

4.10.7.3 Alternative 2: BLM Utility Corridor Route

Under Alternative 2, the temporary changes in access to recreation areas during construction would be similar to the Proposed Action. The long-term effects to recreation quality on recreation areas would be the same as under the Proposed Action in all zones except the Quartzsite Zone, which would be greater than those under the Proposed Action because the Project would be a new, substantial feature on the landscape that would change a recreational user's experience from the current condition.

A substantial difference in recreation effects between Alternative 2 and the Proposed Action is to the La Posa LTVA in the Quartzsite Zone. The La Posa LTVA would be crossed by two Alternative 2 segments. There would be minor to moderate effects to the La Posa LTVA under Alternative 2. However, in comparison to Alternative 1, Alternative 2 would avoid the Dome Rock Camping Area.

The effects to hunting, OHV routes, and the proposed Arizona Peace Trail under Alternative 2 would be the similar to those under the Proposed Action.

Subalternatives to Alternative 2 (2A through 2E)

The only subalternative that would have differences in effects to recreation from Alternative 2 is Subalternative 2C; the route would go through Johnson Canyon (Segment cb-02) rather than Copper Bottom Pass, which would have a larger effect on OHV use because Johnson Canyon is undeveloped and could take away from the user's experience. Also, during construction of Segment cb-02 the proposed Arizona Peace Trail and other OHV routes would be temporarily closed, which would have moderate effects on OHV users. Mitigation would reduce this to a minor effect (Section 4.10.6).

4.10.7.4 Alternative 3: Avoidance Route

Under Alternative 3, the temporary changes in access to recreation areas during construction would be similar to the Proposed Action. The long-term effects to recreation quality on recreation areas would be the same where Alternative 3 includes Proposed segments and greater where Alternative 3 includes Alternative segments because within Alternative segments the Project would be a new, substantial feature on the landscape that would change a recreational user's experience from the current condition. This alternative would avoid the Kofa NWR. Unlike Alternatives 1 or 2, Alternative 3 would not affect the Dome Rock Camping Area or La Posa LTVA in the Quartzsite and Copper Bottom Zones.

Alternative 3 would avoid both Johnson Canyon and Copper Bottom Pass, which would be less of an effect to OHV routes in this area than the Proposed Action. The effect on hunting would be the same as the Proposed Action.

Subalternatives to Alternative 3 (3A through 3M)

Table 4.10-6 summarizes the differences in recreation effects between the Alternative 3 subalternatives (3A through 3M) and Alternative 3.

Table 4.10-6 Comparison of Subalternatives with Alternative 3

SUBALT.	ZONE	DIFFERENCES FROM ALTERNATIVE 3
3A	East Plains and Kofa	None
3B	East Plains and Kofa	None
3C	East Plains and Kofa	None
3D	East Plains and Kofa	None
3E	Quartzsite	Route would go through the La Posa LTVA, which would increase the recreation effects (Section 4.10.4.3)
3F	Quartzsite	Route would be adjacent to the La Posa LTVA, which would increase the recreation effects (Section 4.10.4.3)
3G	Quartzsite	None
3H	Quartzsite	None
3J	Quartzsite	None

SUBALT.	ZONE	DIFFERENCES FROM ALTERNATIVE 3
3K	Copper Bottom	Route would go through Johnson Canyon rather than Copper Bottom Pass, which would have a larger effect on OHV use because Johnson Canyon is undeveloped; also, the proposed Arizona Peace Trail and other OHV routes in Johnson Canyon would be closed temporarily during construction which would have a moderate effect on OHV users. Mitigation would reduce this to a minor effect (Section 4.10.6).
3L	Copper Bottom	Route would go through the Dome Rock Camping Area, which would increase the recreation effects (Section 4.10.4.4). There would not be any helicopter fly yards.
3M	Colorado River and California	None

4.10.7.5 Alternative 4: Public Lands Emphasis Route

Under Alternative 4, the temporary changes in access to recreation areas during construction would be similar to the Proposed Action. The long-term effects to recreation quality on recreation areas would be the same where Alternative 4 includes Proposed segments and greater where Alternative 4 includes Alternative segments because within Alternative segments the Project would be a new, substantial feature on the landscape that would change a recreational user's experience from the current condition. This alternative would avoid the Kofa NWR. Alternative 4 would avoid the Dome Rock Camping Area but would run adjacent to the La Posa LTVA.

Alternative 4 would run through Johnson Canyon, which would be more of an effect to OHV routes in this area than the Proposed Action. The effect on hunting would be the same as the Proposed Action.

Subalternatives to Alternative 4 (4A through 4P)

The only subalternative that would have differences in effects to recreation resources from Alternative 4 is Subalternative 4E: the route would avoid Johnson Canyon and instead go over Cunningham Peak; this would reduce OHV effects.

4.10.8 Residual Effects

Depending on the alternative (Section 4.10.7), after implementation of MMs, there would be residual negligible to minor effects from illegal OHV use, minor to moderate effects related to the temporary construction closure of the proposed Arizona Peace Trail through Johnson Canyon, and residual negligible to minor increase in safety risk to OHV users, respectively. Additionally, there would be minor to major residual recreation effects under some alternatives from the crossing of the La Posa LTVA and Dome Rock Camping Area near Quartzsite and minor residual recreation effects on the Ehrenberg Sandbowl OHV Area because these effects (other than safety risk to OHV users) would not be mitigated.

4.10.9 CDCA Plan Compliance

CMAs DFA-REC-1, DFA-REC-2, DFA, REC-4, DFA-REC-5, DFA-REC-7 would apply to the Project (Appendix 2C). The Project would comply with these CMAs through BMP-REC-01 (Appendix 2A, Section 2A.7).

4.10.10 Unavoidable Adverse Effects

Under some alternatives (Section 4.10.7), during construction the temporary closure of OHV use in portions of the Copper Bottom Pass area, and the proximity to Quartzsite camping areas would be an unavoidable, short-term, adverse, moderate effect on OHV users on the proposed Arizona Peace Trail and other OHV routes. The effect of temporary OHV closures and the safety risk to OHV users would be mitigated to a minor effect (Section 4.10.6).

In the long term, under all alternatives the main unavoidable adverse effect would be increased development in natural areas heavily used for recreation. The addition of the Project would impact the scenic views of recreationists, increasing the perception of development and clutter in conjunction with the existing DPV1 transmission line. New or expanded access routes would remain after construction, increasing the access in and around otherwise natural areas, which would affect the character of the recreation environment in some areas. This would be an unavoidable, long-term, adverse negligible to moderate impact.

4.10.11 Cumulative Effects

Historic proliferation of authorized and unauthorized roads and trails, the establishment of Federal, state, County and private lands, and community development have all shaped the recreation opportunities, settings, and desired experiences in the CEA. Though land in the analysis area is largely undeveloped, it is characterized by both developed (i.e., utility ROWs) and undeveloped desert, agricultural lands, and by areas used for grazing, transportation corridors, utilities, recreation, and widely dispersed, low-density residential development. In general, construction activities from the Project, when considered with other linear ROW projects (e.g., solar energy facility generation tie-in lines, transmission lines, and pipeline projects) would contribute to the modification of the character of the recreation setting, which would contribute to potentially detracting from desired recreation experiences. Construction activities of the Project and other reasonably foreseeable actions may detract from or temporarily hamper access to recreational opportunities.

Where the Project would occur in existing ROWs and currently developed/disturbed areas, the likelihood that users are currently pursuing primitive or unconfined recreational settings and solitude is low, therefore no cumulative impacts are anticipated. However, it is more possible that users will be pursuing primitive and unconfined recreational opportunities and solitude in currently undeveloped areas of the CEA. In conjunction with the Project, reasonably foreseeable future actions in undeveloped areas would have a minor cumulative effect on the recreation experience and availability of primitive or unconfined recreational settings and solitude in the CEA. Larger projects, such as solar facilities, and specifically the proposed 5,935-acre La Paz County land conveyance, would permanently remove lands from recreation.

The Proposed Action and portions of the other alternative routes would be constructed adjacent to the existing DPV1. The DPV1 was constructed across or adjacent to recreation areas in La Paz and Maricopa Counties in Arizona, and Riverside County in California, including the Kofa NWR. Adding the Project adjacent to this existing ROW would intensify the overall development that crosses these recreational resources. Any additional projects that may traverse these recreational areas would further increase the industrial development and further reduce the undeveloped, natural landscape of the recreational areas.

OHV riders may have cumulatively more opportunities available as a result of the Project and other past transmission line and pipeline development projects, since these projects required new access roads just as the Project would. New access roads used for construction (as well as maintenance) provide additional avenues for riders to gain access to locations that were previously unavailable. Adding the Project structures with guy wires adjacent to a ROW that already contains the DPV1 or other transmission lines would cumulatively add to the safety risk to OHV riders in some cases; however, MM-REC-02 would reduce this cumulative effect in these locations (Section 4.10.6). Both increasing authorized and unauthorized OHV use is likely to result in increasing complaints from landowners and the public. As the Project adds to road density at the same time OHV use increases, there would be a need for additional enforcement and physical barriers to protect some areas.

The quality of the recreational setting and desired experiences could be degraded by the loss of undeveloped landscape character and visual intrusion on the landscape as a result of the cumulative impact of the Project construction and the past, present, and reasonably foreseeable actions identified in Tables 3.20-5 and 3.20-6. The cumulative impact of this temporary alteration of the recreation setting would be minor since recreation settings would be available in adjacent settings, other cumulative actions would be far-removed and would not affect adjacent lands along the entire ROW and would be returned to existing settings following construction. Operation and maintenance activities of the Project would result in minor cumulative effects, since the Project would already be constructed and standard operation and maintenance activities would be so periodic as to not affect recreation opportunities, experiences, or desired settings.

4.10.11.1 Zone-Specific Cumulative Effects

East Plains and Kofa Zone

During construction of any of the linear RFFPs, recreation would be disrupted but would resume after reclamation activities. These projects would cumulatively remove a small amount of lands available for recreation in comparison to the lands available for recreation in the East Plains and Kofa Zone CEA. Larger projects, such as solar facilities, specifically the 5,935-acre La Paz County land conveyance, would permanently remove lands from recreation. In conjunction with past and present projects, cumulative impacts from the Project and reasonably foreseeable future projects to recreation would be negligible to minor.

Quartzsite Zone

Reasonably foreseeable future projects in the Quartzsite Zone include the Plomosa 9 Placer Claim mine and the Quartzsite Wastewater Treatment Plant expansion/renovation. The Quartzsite Wastewater Treatment Plant project would be within its current footprint so itself would not contribute to cumulative changes to recreation. The Plomosa 9 Placer Claim would remove 20 acres of land from recreational opportunities. In conjunction with past and present projects, cumulative impacts from the Project and reasonably foreseeable future projects to recreation would be negligible.

Copper Bottom Zone

Reasonably foreseeable future projects in the Copper Bottom Zone include the West Port Gold mine. The West Port Gold project would remove 40 acres of land from potential recreation. In conjunction with past and present projects, cumulative impacts from the Project and reasonably foreseeable future projects to recreation would be negligible.

Colorado River and California Zone

There is a limited amount of recreation in this zone, as the California portion consists mostly of cropland, residential, and commercial lands. The reasonably foreseeable future projects in this zone, not including the Project, include a power plant and three large scale solar facilities totaling 14,601 acres (Table 4.3-2), more than half of which would be on BLM-administered land (Table 3.20-6). In conjunction with past and present projects, cumulative impacts from the Project and reasonably foreseeable future projects to recreation would be negligible.

4.10.12 Irreversible and Irretrievable Commitment of Resources

There would not be an irreversible commitment to recreation resulting from the Project. Existing recreation opportunities and activities, recreation settings, desired recreation experiences, and adjacent recreation areas could be restored to existing conditions if the Project and facilities were removed in the future.

However, as for recreation setting, it could take years before the Project footprint is no longer visible to recreation users. Even when vegetation is established during reclamation efforts, the composition of plant species in the recovery area is often different than the original vegetation community. Typically, grasses establish early on, whereas shrubs take much longer to reestablish. Because of the desert environment, reclamation and revegetation to achieve a visually naturalized state is extremely difficult, if not impossible and may never fully visually recover.

4.10.13 Relationship of Short-term Uses and Long-term Productivity

Construction and operation and maintenance of the Project would result in use of land and other resources for energy transmission and would preclude recreation in areas occupied by the transmission line structures, the SCS, and ancillary facilities. This change in land use and subsequent loss of recreation opportunities would be a very small amount (and thus a negligible impact) of acreage. Implementation of the Project would not completely eliminate recreational access and activities in any of these areas in the long term. The temporary and negligible impacts to recreation are not anticipated to be long-term changes in hunting, hiking, and motorized vehicle use patterns because construction of the Project would not substantially decrease (or in the case of new access roads, increase) the areas available for dispersed recreation. Implementation of the Project may create long-term disruptions of the visual quality due to the contrast that transmission facilities create upon the existing landscape, but these impacts would not affect all users. There would be no maintenance or enhancement of recreational resources, but all existing access to recreation areas would be maintained during construction and operation and maintenance. However, due to the nature of the Project occurring in areas that largely already experience these types of impacts (e.g., vehicle use patterns, desired recreation setting), the impact is negligible since the Project would not eliminate recreation use.

4.11 SPECIAL DESIGNATIONS, MANAGEMENT ALLOCATIONS, AND WILDERNESS RESOURCES

4.11.1 Introduction

Potential effects to special designations, management allocations, and wilderness resources are discussed in terms of Project activities directly or indirectly altering, conflicting, or requiring new management prescriptions for special designations, management allocations, or wilderness resources. SRMAs are discussed in Section 4.10, Recreation.

4.11.2 Methods for Analysis

4.11.2.1 Analysis Area

The analysis area for special designations, management allocations, and wilderness resources is a 4,000-foot wide corridor encompassing the Project. Because there is some flexibility in final siting of the temporary use areas (construction), Project structures, and SCS, this analysis area will include areas where Project-related actions would alter, conflict with, or require new management prescriptions and objectives, or otherwise physically or administratively affect Federally, state, or municipally established, designated, or reasonably foreseeable planned special use areas.

4.11.2.2 Assumptions

The following assumption was made when performing the analysis of Project impacts on special designations:

- Lands with wilderness characteristics in the analysis area will remain as “not managed for wilderness characteristics”.

4.11.2.3 Environmental Effect Indicators, Magnitude, and Duration

Effects to special designations, management allocations, and wilderness resources would occur as a result of:

- Conflicts with the goals, objectives, and resources a particular special designation or management allocation is intended to protect.

Effects to special designations, management allocations, and wilderness resources may be negligible, minor, moderate, or major, and may have durations that are qualified as temporary, short term, or long term (Table 4.11-1, Section 4.1).

Table 4.11-1 Special Designations, Management Allocations, and Wilderness Resources Effect Magnitude and Duration Definitions

ATTRIBUTE OF EFFECT		DESCRIPTION RELATIVE TO SPECIAL DESIGNATIONS, MANAGEMENT ALLOCATIONS, AND WILDERNESS RESOURCES
Magnitude	Negligible	Lands with special designations, management allocations, and wilderness resources may be slightly affected but these effects would not noticeably change the inherent value, management prescriptions, or objectives of the special designation.
	Minor	Lands with special designations, management allocations, and wilderness resources may be affected and these effects may or may not cause an effect on the inherent value, management prescriptions, or objectives of the special designation.
	Moderate	Lands with special designations, management allocations, and wilderness resources may be affected and these effects would cause an effect on the inherent value, management prescriptions, or objectives of the special designation.
	Major	Lands with special designations, management allocations, and wilderness resources would be affected and these effects would cause an effect on the inherent value, management prescriptions, or objectives of the special designation.
Duration	Short-term	10 years or less.
	Long-term	More than 10 years.

4.11.3 No Action Alternative

Under the No Action Alternative, no ROW would be granted for the Project and the transmission line, SCS, and ancillary facilities would not be constructed. There would not be any conflict with special designations, management allocations, or wilderness resources.

4.11.4 Construction of Action Alternative Segments

4.11.4.1 Direct and Indirect Effects Common to All Action Alternatives

Potential direct effects from construction activities on special designations, management allocations, and wilderness resources would include direct ground disturbance and temporary increases in ambient noise levels in areas where the Project could intersect with special designations, management allocations, and wilderness resources. Increases in ambient noise levels, the presence of equipment, and dust would be temporary indirect effects in areas adjacent to special designations, management allocations, and wilderness resources and would decrease with the completion of construction activities. Access to special designations, management allocations, and wilderness resources may be temporarily rerouted during construction, which would be a short-term indirect effect. Effects to special designations, management allocations, and wilderness resources during construction would be minor since the activities would be temporary in nature. The Project's control measures, APMs, and BMPs would minimize the potential for these effects; therefore, construction related impacts would be negligible.

Potential long-term effects to special designations, management allocations, and wilderness resources due to operations, maintenance, and decommissioning could occur where Project facilities would be sited near or within WAs, WHMAs, or lands with wilderness characteristics. Some alternatives would have indirect effects on BLM- and USFWS-managed WAs due to noise, dust, and the proposed presence of heavy equipment during construction.

There would not be effects to DFAs under any of the alternatives. All of the alternatives would be located within a DFA and are an appropriate development within this allocation.

4.11.4.2 East Plains and Kofa Zone

Direct and Indirect Effects Common to All Segments in the Zone

Four WHMAs and three WAs could be indirectly affected in the East Plains and Kofa Zone: the Palomas Plain, Desert Mountains, Wildlife Movement Corridor, and Lake Havasu Field Office WHMAs; and the Big Horn Mountains, Kofa NWR, and Eagletail Mountains WAs. This would be a negligible to minor, long-term indirect effect on these specially designated lands. Of these, the Desert Mountains and Lake Havasu Field Office WHMAs would be crossed by the Project, which would be a negligible effect on the management prescriptions and objectives of these WHMAs.

Direct and Indirect Segment-specific Effects

Three lands with wilderness characteristics polygons would be indirectly affected in the East Plains and Kofa Zone: Polygons 14, 17, and 34. Of these, 42 acres would be removed from the edge of Polygon 34 by Alternative Segment in-01. However, this would not reduce Polygon 34 to less than the 5,000-acre criteria; therefore, Polygon 34 would still meet the criteria for lands with wilderness characteristics.

4.11.4.3 Quartzsite Zone

Direct and Indirect Effects Common to All Segments in the Zone

Two WHMAs and one WA could be indirectly affected in the Quartzsite Zone: the Desert Mountains and Wildlife Movement Corridor WHMAs and the Kofa NWR WA. This would be a negligible to minor, long-term indirect effect on these specially designated lands. Both WHMAs would be crossed by the Project in the Quartzsite Zone, which would be a negligible effect on the management prescriptions and objectives of these WHMAs.

Direct and Indirect Segment-specific Effects

Two lands with wilderness characteristics polygons would be indirectly affected in the Quartzsite Zone: Polygon 13 and Polygon 35_SW. Polygon 35_SW would be reduced by 976 acres by Alternative Segment qn-02. However, this would not reduce Polygon 35_SW to less than the 5,000-acre criteria; therefore, Polygon 35_SW would still meet the criteria for lands with wilderness characteristics.

4.11.4.4 Copper Bottom Zone

Direct and Indirect Effects Common to All Segments in the Zone

Three WHMAs could be indirectly affected in the Copper Bottom Zone: the Desert Mountains, Colorado and Gila River Riparian Area, and Wildlife Movement Corridor WHMAs; no WAs would be affected. This would be a negligible to minor, long-term indirect effect on these specially designated lands. Of these, the Desert Mountains WHMA would be crossed by the Project, which would be a negligible effect on the management prescriptions and objectives of this WHMA.

Direct and Indirect Segment-specific Effects

Lands with wilderness characteristics Polygon 23 would be indirectly and directly affected in the Copper Bottom Zone. Polygon 23 would be reduced by 9 acres by Segment p-09; this segment would not reduce Polygon 23 to less than the 5,000-acre criteria; therefore, it would not affect the wilderness characteristics criteria of the polygon. However, Segments cb-01, cb-02, and cb-04 would reduce Polygon 23 by 624 acres, 408 acres, and 279 acres, respectively, all of which would reduce Polygon 23 to less than the 5,000-acre lands with wilderness characteristics criteria. Therefore, these three segments would represent a long-term, major impact to the lands with wilderness characteristics criteria for Polygon 23.

4.11.4.5 Colorado River and California Zone

Direct and Indirect Effects Common to All Segments in the Zone

The Colorado and Gila River Riparian Area WHMA and the Goose Flats Wildlife Area could be indirectly affected in the Colorado River and California Zone. This would be a negligible to minor, long-term indirect effect on these specially designated lands. There are no WAs or lands with wilderness characteristics that would be affected in the Colorado River and California Zone. The Project would not conflict with the DFA.

Direct and Indirect Segment-specifics Effects

There would not be any substantial effects related to any of the Proposed Action or Alternative Segments in the Colorado River and California Zone.

4.11.5 Operations, Maintenance, and Decommissioning

Potential effects to special designations, management allocations, and wilderness resources could occur where Project facilities would be sited near or within WAs, lands with wilderness characteristics, or WHMAs present within the analysis area (Section 3.11.3.5 and 3.11.3.6). Potential indirect effects could include changes to the natural, cultural, historic, or visual character of these special designations, management allocations, and wilderness resources. Despite potential indirect effects on special designations, management allocations, and wilderness resources from changes in the character of the surrounding lands, the indirect effects to WAs, lands with wilderness characteristics, or WHMAs would be negligible to minor. The Arizona Desert Wilderness Act of 1990 did not intend for the designation of wilderness areas to lead to the creation of protective perimeters and buffer zones. The act states, “The fact that non-wilderness activities or uses can be seen or heard from within the wilderness shall not, of itself, preclude such activities or uses up to the boundary of the wilderness area." As such, while indirect visual or noise-related effects from the Project could affect outstanding opportunities for solitude or primitive and unconfined recreation in WAs or lands with wilderness characteristics, these indirect actions would not affect these areas designation status or lands with wilderness characteristics criteria, respectively.

Direct effects could include increased access to special designations, management allocations, and wilderness resources due to the presence of access roads. This could lead to increased authorized and/or unauthorized use of areas by OHV users, which could conflict with management objectives for some special designations, management allocations, and wilderness resources. Cultural and historic, OHV, and effects are discussed in Sections 4.6, 4.10, and 4.18, respectively. Direct effects would also result if the presence of the Project changed the character of a lands with wilderness characteristics polygon such that it no longer met the lands with wilderness characteristics criteria. There would be no direct effects on WAs, as no Project segments would be within WA boundaries. Direct effects to WHMAs would be unlikely because the management objectives of WHMAs – wildlife management, conservation, and biodiversity; hunting and fishing; wildlife viewing; and tribal interests – would not be affected by the presence of the Project.

Some segments would cross lands with wilderness characteristics polygons. If a lands with wilderness characteristics polygon is fractured by new roads and/or the transmission structures, reducing the acreage of the polygon to less than the 5,000-acre lands with wilderness characteristics criteria, and the polygon is not adjacent to a WA, it would no longer meet the 5,000-acre lands with wilderness characteristics criteria. This would be a direct, long-term, major effect on the lands with wilderness characteristics criteria for the polygon. This direct effect to lands with wilderness characteristics is discussed in Section 4.11.4.

4.11.6 Mitigation Measures

There are no MMs identified for special designations, management allocations, and wilderness resources for any of the specific segments and thus, no MMs have been identified for any of the full route alternatives or subalternatives described below.

4.11.7 Construction of Full Route Alternative and Subalternative Effects

4.11.7.1 Proposed Action

Indirect effects to special designations, management allocations, and wilderness resources under the Proposed Action would be negligible to minor. Direct effects would be negligible.

4.11.7.2 Alternative 1: I-10 Route

Effects to special designations, management allocations, and wilderness resources under Alternative 1 would be similar to those under the Proposed Action.

Subalternatives to Alternative 1 (1A through 1E)

There would not be any difference between Subalternatives 1A through 1E and Alternative 1.

4.11.7.3 Alternative 2: BLM Utility Corridor Route

Effects to special designations, management allocations, and wilderness resources under Alternative 2 would be similar to those under the Proposed Action.

Subalternatives to Alternative 2 (2A through 2E)

Subalternative 2C would include Alternative Segments cb-02 and cb-04 which would have major effects on the lands with wilderness characteristics criteria of Polygon 23. The effects of the other subalternatives would be the same as those under Alternative 2.

4.11.7.4 Alternative 3: Avoidance Route

Alternative 3 would include Alternative Segments cb-01 and cb-04 which would have major effects on the lands with wilderness characteristics criteria of Polygon 23.

Subalternatives to Alternative 3 (3A through 3M)

There would not be any difference between Subalternatives 3A through 3M and Alternative 3.

4.11.7.5 Alternative 4: Public Lands Emphasis Route

Alternative 4 would include Alternative Segments cb-02 and cb-04 which would have major effects on the lands with wilderness characteristics criteria of Polygon 23.

Subalternatives to Alternative 4 (4A through 4P)

Subalternative 4G would not include Segments cb-02 and cb-04; therefore, it would not have the effect on the lands with wilderness characteristics criteria of Polygon 23 that would occur under Alternative 4. All other subalternatives would have the same effects as Alternative 4.

4.11.8 Residual Effects

There would not be any mitigation for special designations, management allocations, and wilderness resources; therefore, there would not be any residual effects.

4.11.9 CDCA Plan Compliance

CMAs DFA-REC-1, DFA-REC-2, DFA, REC-4, DFA-REC-5, DFA-REC-7 would apply to the Project (Appendix 2C). The Project would comply with these CMAs through BMP-REC-01 (Appendix 2A).

4.11.10 Unavoidable Adverse Effects

Unavoidable adverse effects to special designations, management allocations, and wilderness resources would occur from reducing lands with wilderness characteristics Polygon 35_SW to less than 5,000 acres, which would affect its criteria required of lands with wilderness characteristics.

4.11.11 Cumulative Effects

The past uses in the CEA have had a direct effect on special designations, management allocations, and wilderness resources. Potential impacts from past, present, and reasonably foreseeable actions could affect special designations, management allocations, and wilderness resources by indirectly changing the natural, historic, cultural, or visual character of some special designations or by conflicting with management objectives.

Recognition by various agencies of a landscape's unique and valuable resources led to protective measures enacted by Federal, state, and local governments. FLPMA is the primary legislation used to protect special designations, although several other enabling legislative actions may also prescribe special designations, management allocations, and wilderness resources, as stated in Chapter 3. Construction of the Project, when combined with the past and present actions in Table 3.20-6, would not likely have a cumulative effect on WAs since the WA designation precludes the types of uses included in the Project. For example, WAs preclude roads and manmade structures.

Past and present actions have fragmented and reduced lands with wilderness characteristics, and the Project would cumulatively add to this impact. The cumulative impacts from operation and maintenance of the Project and placement of other linear features and human-made structures on the landscape would further decrease the amount of lands with wilderness characteristics in the CEA. Lands with wilderness characteristics directly affected by the Project and any reasonably foreseeable present or future actions could split lands with wilderness characteristics into separate parcels or reduce them in size below the 5,000-acre criteria by placement of human structures and roads. The cumulative effects of operation and maintenance of the Project with other reasonably foreseeable projects could also reduce naturalness in lands with wilderness characteristics by introducing unnatural or human-made objects to the landscape, and affecting or reducing the amount of soils, vegetation, or natural habitats in the region. Impacts to naturalness during operation and maintenance would result from the presence (e.g., in sight) of the transmission line, ancillary facilities, and vegetation clearing of the ROW in combination with other past and present actions such as roadways, transmission lines, and pipelines. Finally, the cumulative effects of operation and maintenance of the Project with other reasonably foreseeable projects could alter the setting required to support opportunities for solitude and/or primitive recreation for visitors to lands with wilderness characteristics.

The Project and reasonably foreseeable future projects would be visible from surrounding lands within the CEA and may be in the viewshed of special designation areas, such as WHMAs. To the extent that distant views of the surrounding landscape are a valuable component of recreational use of the CEA, diminishment of this character could be considered a potentially minor to major cumulative impact. While the structures would tend to blend with the surrounding desert landscape when viewed from a distance and from a viewer superior position, they may be more visible under certain lighting conditions, or the disturbance from the Project may be visible when the Project infrastructure is not. However overall cumulative visual impacts at these distances would be minor.

4.11.11.1 Zone-Specific Cumulative Effects

East Plains and Kofa Zone

There would not be any measurable direct effects to special designations, management allocations, and wilderness resources in the East Plains and Kofa zone. Also, construction of RFFPs in the East Plains and Kofa zone would be unlikely to occur in the same location as the Project near special designations, management allocations, and wilderness resources. Therefore, there would not be any cumulative effects.

Quartzsite Zone

There would be moderate, long-term effects on lands with wilderness characteristics Polygon 35_SW because approximately 20 percent of the lands with wilderness characteristics would be removed because it wouldn't meet the criteria required. Combined with past actions in the zone that have also reduced lands with wilderness characteristics, this would be a minor cumulative effect on lands with wilderness characteristics in the Quartzsite zone.

Copper Bottom Zone

There would be negligible to major, long-term effects on lands with wilderness characteristics Polygon 23 depending on the segment; segments cb-01, cb-02, and cb-04 would cause Polygon 23 to be less than 5,000 acres, impacting its potential for possible future designation as a WA through Congressional action. Combined with past actions in the zone that have also reduced lands with wilderness characteristics, this would be a moderate cumulative effect on lands with wilderness characteristics in the Copper Bottom Zone.

Colorado River and California Zone

There would not be any measurable direct effects to special designations in the Colorado River and California zone. Also, construction of RFFPs in the Colorado River and California zone would be unlikely to occur in the same location as the Project near special designations. Therefore, there would not be any cumulative effects.

4.11.12 Irreversible and Irretrievable Commitment of Resources

No irreversible or irretrievable commitment of special designations, management allocations, and wilderness resources would occur as a result of the Project.

4.11.13 Relationship of Short-term Uses and Long-term Productivity

The Project could cause short-term use impacts for special designations, management allocations, and wilderness resources during construction activities and long-term productivity impacts to lands with wilderness characteristics areas that are reduced to less than 5,000 acres, as they would not qualify for potential WAs. Visual disturbances created by the removal of vegetation within the ROW would persist for many years, but would fade as the structure and function of the natural vegetation was restored. Ultimately there would be no long-term impacts to the productivity of special designations, management allocations, and wilderness resources with regard to the natural setting.

4.12 NOISE

4.12.1 Introduction

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity and that interferes with or disrupts normal activities. Although prolonged exposure to high noise levels has been demonstrated to cause hearing loss (e.g., EPA suggests that noise above 70 dB over an extended period can be related to hearing loss), the principal human response to environmental noise when lower than this threshold is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise; the perceived importance of the noise, and its appropriateness in the setting; the time of day and the type of activity during which the noise occurs; and the sensitivity of the individual.

Much of the Project is relatively rural. As a result, with the exception of areas along major highways and where clusters of development occur, noise levels throughout much of the noise study area are low. Existing noise sources in the study area include highways, roadways, OHV use, agricultural activities, population centers, and natural noise-producing sources such as wind, insects, and other animals. Another low-level source of noise is from existing transmission lines that emit corona noise under certain atmospheric conditions.

In terms of the Project, noise impacts would be associated with construction, operations, maintenance, and decommissioning activities (e.g., from equipment and vehicles and corona noise from transmission lines under foul weather conditions).

4.12.2 Methods for Analysis

4.12.2.1 Analysis Area

Noise impacts associated with the Project are assessed in a study area defined as a 4,000-foot-wide corridor encompassing the Proposed Action and Alternative Segments. Within this area, noise from the Project was assessed.

4.12.2.2 Assumptions

The analysis assumes that all appropriate design features, APMs, and BMPs described in Appendix 2A would be implemented.

The Project is subject to general Federal and state qualitative noise guidelines and a Riverside County ordinance that may limit the hours of construction activity (Table 4.12-1).

Table 4.12-1 Project Noise Guidelines and Requirements

LEVEL	SOURCE	CRITERIA	NOTES
Federal	US Environmental Protection Agency	24-hour noise exposure less than 70 dB	Guideline
Federal	US Environmental Protection Agency	Maximum L_{dn} 55 dBA outdoors	Guideline
Local	Riverside County General Plan (2015a)	Noise attenuation measures required for land use exposed to levels greater than 65 CNEL	Requirement
Local	Riverside County General Plan (2015a)	Stationary source facility-related limits received by sensitive land uses: 45 dBA, 10-minute L_{eq} between 10 p.m. and 7 a.m.	Requirement
Local	Riverside County General Plan (2015a)	Stationary source facility-related limits received by sensitive land uses: 65 dBA, 10-minute L_{eq} between 7 a.m. and 10 p.m.	Requirement
Local	Riverside County General Plan (2015a)	Construction not to occur between 6 p.m.to 6 a.m.	Required June–September
Local	Riverside County General Plan (2015a)	Construction not to occur between 6 p.m. to7 a.m.	Required October–May
Local	City of Blythe General Plan (2007a)	Exterior level of 60 dB L_{dn}	Noise impact criteria
Local	City of Blythe General Plan (2007a)	Interior level of 45 dB L_{dn}	Noise impact criteria

Notes: dB = decibels, L_{dn} = day-night sound level, dBA = A-weighted decibel, CNEL = Community Noise Equivalent Level, L_{eq} = equivalent sound level

4.12.2.3 Environmental Effect Indicators, Magnitude, and Duration

Impacts of noise would result if any of the following were to occur from construction or operation of the Project:

- Exceedance of local, state, or Federal noise regulations or guidelines;
- Increased noise levels that would impose restrictions on land currently planned for residential development or would disturb existing sensitive receptors;
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
- A substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project;
- A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project;
- Exposure of persons residing or working in the Project Area to excessive noise levels due to location within 2 miles of a public airport or public use airport;

- Exposure of persons residing or working in the Project Area to excessive noise levels due to nearby private airstrip;
- Cause off-site noise levels to exceed land use compatibility standards or criteria established in the local general plan;
- Create a long-term impact on noise-sensitive land uses by increasing ambient CNEL levels by 10 dBA or more, even if the resulting noise level is below applicable land use compatibility standards;
- Generate short-term noise levels that pose a risk of hearing damage for persons living or working at off-site locations; and
- Increased noise levels directly or indirectly affecting any places of traditional use identified as important to tribes.

Units to measure change will include:

- Ambient noise levels as measured in decibels (dBA);
- Typical predicted project-related noise levels in decibels (dBA); and
- Distance in feet or miles.

Impacts to noise may be negligible, minor, moderate, or major, and may have durations that are qualified as temporary, short term, or long term (Table 4.1-1, Section 4.1). Increases to noise levels that impose restrictions on land use or that affect cultural sites of concern are analyzed qualitatively herein.

4.12.3 No Action Alternative

Under the No Action Alternative, no ROW would be granted for the Project and the transmission line, SCS, and ancillary facilities would not be constructed. The BLM-administered land on which the Project is proposed would continue to be managed as it currently exists. Lands in the analysis area would remain as is, which is primarily undeveloped desert land available for dispersed and developed recreation, subject to existing closures or restrictions. Existing background noise from highways, roadways, OHV use, agricultural activities, population centers, and natural noise-producing sources such as wind, insects, and other animals, as well as corona noise from existing transmission lines, would be unchanged by the Project.

4.12.4 Construction of Action Alternative Segments

4.12.4.1 Direct and Indirect Effects Common to All Action Alternatives

Noise is a potential issue to sites that are in current use by tribal members. Noise-sensitive receptors (NSR) identified within the analysis area are listed in Table 4.12-2 and illustrated on Figure 3.12-1a-u (Appendix 1). Noise-sensitive receptors include residences, schools and day care facilities, hospitals, long-term care facilities, places of worship, libraries, and parks and recreational areas specifically known for their solitude and tranquility. Segments where NSR were not present (i.e., NSR=0) are not included in Table 4.12-2.

Table 4.12-2 Segments of the Project with Identified Noise-Sensitive Receptors

ZONE	SEGMENT	NOISE-SENSITIVE RECEPTORS	LOCATION
Quartzsite	qn-02	80	Residences and Quartzsite Alliance Church in Quartzsite
Quartzsite	qs-01	251	Residences including La-Z Daze Trailer Park and Rice Ranch RV Park, the Church of Jesus Christ of Latter-day Saints, and La Posa LTVA in Quartzsite
Quartzsite	qs-02	54	Residences including Desert Gardens RV Park and a Super 8 hotel
Quartzsite	x-06	Variable; thousands per year	Adjacent to La Posa LTVA; the number and location of potential noise-sensitive receptors changes over time
Quartzsite	x-07	Variable; thousands per year	Through La Posa LTVA south of Quartzsite, Arizona; the number and location of potential noise-sensitive receptors changes over time
Colorado River and California	p-15w	8	Rural residential area near Ripley, California
Colorado River and California	x-09	2	Residences along the Colorado River in Blythe, California
Colorado River and California	x-10	63	Residences along the Colorado River in Blythe, California
Colorado River and California	x-11	8	Residences along the Colorado River in Blythe, California
Colorado River and California	x-12	2	Rural residential area southwest of Blythe, California
Colorado River and California	x-13	2	Rural residential area near Blythe, California
Colorado River and California	ca-01	8	Rural residential area south of Blythe, California
Colorado River and California	ca-02	1	Rural residential area, southwest of Blythe, California
Colorado River and California	ca-05	21	Rural residential area near the Cyr airfield near Blythe, California
Colorado River and California	ca-06	3	Rural residential area near Blythe, California

As identified in Table 4.12-2, NSR are located in proximity to one Proposed segment in California (p-15w) and 13 Alternative segments in California and Arizona and are generally located in or near Quartzsite and Blythe, within two identified zones: Quartzsite Zone and Colorado River and California Zone.

Although wildlife resources are present throughout many of the segments, sensitive wildlife resources are present along Segment p-06 where it crosses the Kofa NWR. Alternative segments running through or in proximity to Quartzsite and Blythe have the potential to affect more NSR than segments in rural areas. Alternative segments with the highest numbers of noise-sensitive receptors in the noise study area include Segments qn-02, qs-01, qs-02, x-06, x-07, x-10, and ca-05. Alternative Segments ca-01, ca-02, and ca-05 are located near airports or airfields.

The noise levels expected to be generated by construction equipment have been calculated and published in various reference documents. The FHA has published construction noise data for construction projects, which is used to determine construction noise impacts.

While the duration of the operation of the concrete batch plants is short-term (i.e., during construction or up to 5 years), the concrete batch plants can be expected to remain in one location for a longer time than other types of construction equipment. Noise from concrete batch plants is incorporated into the Project construction noise estimates.

Ground-borne vibration impacts are only expected with pile-driving activities. At this time, pile-driving is not anticipated during construction of the Project.

Existing levels of ambient noise within the Project and at NSRs range from <35dBA to 65 dBA (Table 3.12-6; Appendix 1, Figures 3.12-1a-w). Construction noise levels are expected to generally be below 65 dBA within a few hundred feet of the limits of construction (HDR 2016b).

Direct and indirect impacts from construction noise are expected to be negligible (i.e., no measurable change in current conditions) to minor in magnitude (i.e., a small, but measurable change in current conditions) for the following reasons:

- construction impacts would be of limited duration (short term);
- construction activity needs to comply with local noise ordinances;
- expected noise levels near NSR are expected to be similar to existing levels of noise; and
- construction of the transmission line would primarily be limited to daytime hours so it is unlikely that construction equipment noise levels would cause sleep disruption for residents at the determined NSR. Further, in general there are few residents along the Project route and construction activities at any given location would be brief.
- Maintenance activities associated with the Project would be anticipated to occur less frequently, include fewer individual noise point sources, and would be of shorter duration. Decommissioning the Project would be similar in noise level to construction-related activities but would occur much farther in the future.

4.12.4.2 East Plains and Kofa Zone

<u>Direct and Indirect Effects Common to All Segments in the Zone</u>

As identified in Table 4.12-2 and in Section 4.12.4.1 above, NSR were not identified in this zone. As such, the direct and indirect effects of noise in this zone is negligible in magnitude. Noise associated with the Project would be short term in duration.

4.12.4.3 Quartzsite Zone

Direct and Indirect Effects Common to All Segments in the Zone

Alternative Segments qn-01, qn-02, qs-01, qs-02, x-06, and x-07 are north of the Proposed Segments p-07 and p-08. Segment x-07 is located along SR 95 and passes through the La Posa LTVA. Segment x-06 is adjacent to the LTVA. Various numbers of NSR may be present within the LTVA at any given time during the year, because visitors may stay for up to 7 months and records of LTVA residents are kept only for a period of 2 weeks (HDR 2016b). Therefore, an exact number of noise-sensitive receptors cannot be provided. However, the La Posa LTVA attracts tens of thousands of visitors per year, particularly during the winter months. The other Alternative segments in this area are located along I-10 and near Quartzsite. Segments qn-02, qs-01, and qs-02 in this area include nearby NSR within the noise study area. Many of the potential NSRs identified are residences in Quartzsite. The Church of Jesus Christ of Latter-day Saints, Quartzsite Alliance Church, RV and trailer parks, and a Super 8 Hotel are included among these receptors. Segments qs-01 and qs-02 pass through the very northern portion of the La Posa LTVA as well as Quartzsite and have the potential to effect thousands of noise-sensitive receptors.

For the reasons provided above, direct and indirect noise impacts from the Project are expected to be negligible (i.e., no measurable change in current conditions) to minor in magnitude (i.e., a small, but measurable change in current conditions) and short term.

4.12.4.4 Copper Bottom Zone

Direct and Indirect Effects Common to All Segments in the Zone

As identified in Table 4.12-2 and in Section 4.12.4.1, NSR were not identified in this zone. A such, the direct and indirect effects of noise in this zone is negligible. Noise associated with the Project would be short term in duration.

4.12.4.5 Colorado River and California Zone

Direct and Indirect Effects Common to All Segments in the Zone

The Proposed segments include eight NSR along Segment p-15w, while the Alternative segments include numerous NSRs in the noise study area, particularly for Segments ca-01, ca-02, ca-05, i-08s, x-10, and x-11. As with the Proposed segments in Arizona, the Proposed segments in California continue to follow existing utility corridors and would be co-located with the existing DPV1 line. The land character south of Blythe is predominantly rural residential areas and farmland.

For the reasons provided above, direct and indirect noise impacts from the Project are expected to be negligible (i.e., no measurable change in current conditions) to minor in magnitude (i.e., a small, but measurable change in current conditions) and short term.

4.12.5 Operation, Maintenance, Decommissioning

For substation noise, standard acoustical engineering methods were used to determine a range of anticipated sound levels based on the megavolt ampere rating of the substation. Predicted levels at distances of interest were calculated based on geometric spreading attenuation using International Organization for Standardization 9613-2, "Acoustics—Sound Attenuation during Propagation Outdoors" (IOS 1996). Additional attenuation factors, such as intervening terrain, structures, barriers, and air absorption were not considered.

Corona is an electrical discharge associated with transmission lines produced by the ionization of fluid (most often humidity in the air) surrounding an electrically charged conductor. In some instances, this phenomenon can produce low-level audible noise. Corona is not a steady source of noise; rather, it varies with humidity conditions.

The Bonneville Power Administration's CAFE Program was used to predict audible corona noise at 10 representative locations in the Project Area (HDR 2017g). Each location is representative of specific segments of the Project and with varying design configurations (not necessarily by NSR; in some cases, no NSRs have been identified in a corona noise model location) to represent the range of potential configurations for the Project (Table 4.12-3). As such, results of the modeling for these 10 locations can be applied, and considered representative, of the other segments of the Project.

Table 4.12-3 Location of Modeled Corona Noise and Associated Segments of the Project

LOCATION NO.	STATE	SEGMENT
1	AZ	**Segment p-01**: North of Delaney Substation, AZ.
2	AZ	**Segment d-01**: Alternative 1 west of Delaney Substation, AZ.
3	AZ	**Segment i-03**: I-10 Utility Corridor, AZ.
4	AZ	**Segment p-06**: Kofa National Wildlife Refuge, AZ.
5	AZ	**Segment qn-02**: North of I-10 and northeast of Quartzsite, AZ
6	AZ	**Segment x-07**: South of I-10 and south of Quartzsite, AZ.
7	AZ	**Segment cb-04**: Copper Bottom Pass, AZ.
8	CA	**Segment p-15w**: East of Blythe, CA in farmland.
9	CA	**Segment x-16**: East of Colorado River Substation, just west of Blythe, CA.
10	CA	**Segment p-17**: East of Colorado River Substation, west of Blythe, CA.

When weather conditions are favorable (i.e., high humidity) corona noise could occur throughout the length of the Project. Corona noise is also related to the condition of the transmission line. The Project location is generally considered to have fair weather during most of the year; however, foul weather, or rain conditions, occurs periodically and seasonally and this is when coronal noise could manifest.

CAFE modeling of audible noise, including corona noise, under wet weather conditions is presented in Table 4.12-4 (HDR 2017g). Audible noise values were calculated at a height of 5 feet above ground based on a horizontally-configured, single 500-kV circuit on a structure with a median height of 145 feet (Appendix 1, Figure 2.2-3), with a minimum clearance of 36.25 feet above ground at the location of maximum sag between structures (HDR 2017g).

The 10 locations modeled for the Project were predicted to have audible noise levels below the US EPA guideline of 55 dBA during foul weather conditions, with the exception of two sites: one located in Segment d-01 (Alternative 1 west of Delaney Substation) and one located in Segment p-06 (within the Kofa NWR). In both of these segments, modeled existing noise values were above the 55 dBA threshold at the edge of the ROW (58.8 and 55.7, respectively). The modeled results with the Project increased the audible noise level by only 0.1 dBA, a change that is not noticeable by the human ear (Table 4.12-4).

These predicted Project levels are in line with existing levels of ambient noise at the NSRs, which range from <45 to 65 dBA (Table 3.13-6). During dry periods, the corona noise levels will be lower than during wet conditions, which were the conditions assessed with the modeling exercise. In the Project Area, the wettest months are typically July through September (the monsoon season), and December through January (US Climate Data 2017, Arizona State Climate Office 2017).

Corona noise measurements taken near a 500kV double-circuit transmission line near Serrano Substation in Anaheim Hills, when humidity was greater than 80 percent and temperatures were in the range of 60 °F (conditions contributing to high corona noise), ranged from 39 dBA Leq (100 feet from outside the conductor) to 46 dBA Leq (directly under the structure).

Maintenance activities associated with substations and transmission lines would be similar in noise level to construction-related activities, but would be anticipated to occur less frequently, include fewer individual noise point sources such as pieces of heavy equipment and/or OHVs and pickup trucks used along the ROW, and would be of shorter duration. Indeed, these activities are predicted to result in maximum noise levels in the 55 to 58 dBA range at a distance of 0.25-mile from the centerline of the ROW (BLM 2013c). Thus, the expected maximum noise levels are in the range of ambient levels (i.e., <35dBA to 65 dBA; HDR 2016b). Maintenance activities are primarily inspection-related (for example, annual inspection of the transmission line from vehicles) and repair of damaged equipment. Actual maintenance activities would occur over a short period of time at any single location and typically would be of shorter duration than during initial construction activities.

Table 4.12-4 Modeled Maximum Audible Noise Under Foul Conditions at Edge of ROW for Existing and Proposed Configurations

LOCATION NO.	STATE	APPROXIMATE LOCATION (SEGMENT)	EXISTING AUDIBLE NOISE UNDER FOUL CONDITIONS (L50 DBA)			PROPOSED AUDIBLE NOISE UNDER FOUL CONDITIONS (L50 DBA)			PROPOSED AUDIBLE NOISE AT THE EDGE OF ROW[C]		
			PEAK IN ROW	LEFT SIDE[A] OF ROW	RIGHT SIDE[B] OF ROW	PEAK IN ROW	LEFT SIDE[A] OF ROW	RIGHT SIDE[B] OF ROW	INCREASE (YES OR NO)	PERCENT INCREASE	BELOW 55 DBA (YES OR NO)
1	AZ	**p-01**: North of Delaney Substation	61.5	55.0	52.9	61.5	52.4	53.0	No	-5.0	Yes
2	AZ	**d-01**: Alternative 1 west of Delaney Substation	62.5	58.8	56.5	62.5	58.9	53.5	No	-5.3	No
3	AZ	**i-03**: I-10 Utility Corridor	N/A	N/A	N/A	50.6	46.0	46.0	Yes	100.0	Yes
4	AZ	**p-06**: Kofa National Wildlife Refuge	60.1	55.7	55.7	60.2	50.9	55.8	No	-8.6	No
5	AZ	**qn-02**: North of I-10 and northeast of Quartzsite	37.5	34.1	33.6	50.7	46.1	43.1	Yes	35.2	Yes
6	AZ	**x-07**: South of I-10 and south of Quartzsite,	40.8	36.5	36.5	49.3	44.7	42.5	Yes	22.5	Yes
7	AZ	**cb-04**: Copper Bottom Pass	57.1	54.7	52.7	57.2	50.1	52.8	No	-8.4	Yes
8	CA	**p-15w**: farmland east of Blythe	58.7	54.6	54.6	58.8	49.9	54.7	No	-8.6	Yes
9	CA	**x-16**: East of Colorado River Substation	41.8	37.8	33.9	49.3	44.8	39.2	Yes	18.5	Yes
10	CA	**p-17**: East of Colorado River Substation	60.1	55.7	52.4	60.2	50.9	52.6	No	-8.6	Yes

a = Left side is the south side at all locations, but location 1 is on the west side.
b = Right side is the north side at all locations, but location 1 is on the east side.
c = TWL is on the left side of corridor except for Location 2 it is on the right.

Direct and indirect impacts from operation and maintenance noise are expected to be long term and negligible (i.e., no measurable change in current conditions) to minor in magnitude (i.e., a small, but measurable change in current conditions) for the following reasons:

- coronal noise associated with the Project would be infrequent and related to specific foul weather conditions;
- coronal noise associated with the Project is predicted to be lower than corona noise from existing transmission lines in some areas of the Project;
- coronal noise associated with the Project is predicted to be higher than corona noise from existing transmission lines in some areas of the Project but less than the 55 dBA threshold;
- coronal noise associated with the Project is predicted to be within existing ambient noise levels at the NSRs;
- average predicted coronal noise directly under the transmission line (~55 dBA) is higher than what has been measured from a similar active transmission line in California (46 dBA Leq) highlighting the conservatism in the CAFE modeling; and
- noises associated with maintenance activities would be similar in noise level to construction-related activities but would be anticipated to occur less frequently.

It is expected that impacts resulting from the decommissioning process would be very similar to the impacts during construction of the Project.

4.12.6 Mitigation Measures

There are no MMs identified for noise for any of the specific segments and thus, no MMs have been identified for any of the full route alternatives or subalternatives described below. The applicant has committed to APMs, and the BLM developed required BMPs, that would further reduce noise impacts (Appendix 2A).

4.12.7 Construction of Full Route Alternative and Subalternative Effects

As noted in the Final WWEC Programmatic EIS (DOE and DOI 2008:3-143) in arid regions of the 11 western states, corona-generated audible noise would occur infrequently. Whether occurring on Federal or non-Federal land, corona noise would be scarcely discernible within ¼ mile or less from the center of the nearest transmission structure. Corona noise for the Project would be more noticeable in areas where NSR are closest to the transmission line.

4.12.7.1 Proposed Action

There are eight NSR that have been identified within the analysis area of the Proposed Action (p-15w). An existing transmission line also runs within the 2,000 feet of the Proposed Action. For the reasons provided above, direct and indirect noise impacts from the Proposed Action are expected to be negligible (i.e., no measurable change in current conditions) to minor in magnitude (i.e., a small, but measurable change in current conditions).

4.12.7.2 Alternative 1: I-10 Route

Within the Alternative 1 analysis area, 331 NSR were identified in Segments qs-01, qs-02, x-09, ca-05, ca-06. These NSR include residential areas, places of worship, and trailer and RV parks (Table 4.12-2). Much of Alternative 1 runs along I-10 where existing noise levels range from <35 to 75 dBA. Some of these areas include public-use and private-use airports. For the reasons provided above, direct and indirect noise impacts from Alternative 1 are expected to be negligible (i.e., no measurable change in current conditions) to minor in magnitude (i.e., a small, but measurable change in current conditions).

<u>Subalternatives to Alternative 1 (1A through 1E)</u>

Although there would be a difference in the number of NSR among some of subalternatives, there would not be any measurable noise impact differences between Subalternatives 1A through 1E and Alternative 1.

4.12.7.3 Alternative 2: BLM Utility Corridor Route

Within the Alternative 2 analysis area, 251 NSR were identified in Segment qs-01. These NSR include residential areas, places of worship, trailer and RV parks, and LTVA (Table 4.12-2). The number of potential NSR at the La Posa LTVA varies throughout the year and could number in the thousands (Segment x-07). Much of Alternative 2 runs along I-10 or other existing roads where existing noise levels range from <35 to 75 dBA. Some of these areas include public-use and private-use airports. For the reasons provided above, direct and indirect noise impacts from Alternative 2 are expected to be negligible (i.e., no measurable change in current conditions) to minor in magnitude (i.e., a small, but measurable change in current conditions).

<u>Subalternatives to Alternative 2 (2A through 2E)</u>

Although there would be a difference in the number of NSR among some of subalternatives, there would not be any measurable noise impact differences between Subalternatives 2A through 2E and Alternative 2.

4.12.7.4 Alternative 3: Avoidance Route

Within the Alternative 3 analysis area, the number of identified NSR is variable throughout the year. These NSR include residential areas, places of worship, trailer and RV parks, and nearby LTVA (Table 4.12-2). There are fixed rural residential areas and places of worship near Blythe (19 NSR in Segments x-11, ca-01, ca-06) and Quartzsite (80 NSR in Segment qn-02). Some portions of Alternative 3 run along the I-10 where existing noise levels range from <35 to 75 dBA. Some portions include public-use and private-use airports and others are within BLM utility corridors. For the reasons provided above, direct and indirect noise impacts from Alternative 3 are expected to be negligible (i.e., no measurable change in current conditions) to minor in magnitude (i.e., a small, but measurable change in current conditions).

Subalternatives to Alternative 3 (3A through 3M)

Although there would be a difference in the number of NSR among some of subalternatives, there would not be any measurable noise impact differences between Subalternatives 3A through 3D and Alternative 3.

4.12.7.5 Alternative 4: Public Lands Emphasis Route

Within the Alternative 4 analysis area, the number of identified NSR is variable throughout the year. These NSR include residential areas, places of worship, trailer and RV parks, and LTVA (Table 4.12-2). While there are fixed rural residential areas near Blythe (7 NSR in Segments x-12, x-13, ca-06, and 63 in Segment x-10), the number of potential NSR at the nearby La Posa LTVA varies throughout the year and could number in the thousands (Segment x-06). Some portions of Alternative 4 run along the I-10 where existing noise levels range from <35 to 75 dBA. Some portions include public-use and private-use airports and others are within BLM utility corridors. For the reasons provided above, direct and indirect noise impacts from Alternative 4 are expected to be negligible (i.e., no measurable change in current conditions) to minor in magnitude (i.e., a small, but measurable change in current conditions).

Subalternatives to Alternative 4 (4A through 4P)

Although there would be a difference in the number of NSR among some of subalternatives, there would not be measurable noise impact differences between Subalternatives 4A through 4P and Alternative 4.

4.12.8 Residual Impacts

No MMs are required for noise resources based upon the incorporation and implementation of the full route alternatives or subalternatives. As such, there are no expected residual impacts from the Project.

4.12.9 CDCA Plan Compliance

CMA LUPA-BIO-12 would apply to the Project (Appendix 2C). The Project would comply with this CMA through APM-NO-01 and BMP-NO-07 (Appendix 2A).

4.12.10 Unavoidable Adverse Effects

For the reasons provided above, direct and indirect noise impacts from the Project are expected to be negligible (i.e., no measurable change in current conditions) to minor in magnitude (i.e., a small, but measurable change in current conditions). There are no unavoidable adverse effects associated with this resource.

4.12.11 Cumulative Effects

The CEA for potential cumulative impacts to noise represents a reasonable region in which noise, when assessed in combination with other cumulative actions, would be impacted if the Project were implemented. Existing and reasonably foreseeable actions have the potential to result in cumulative impacts by increasing the noise. These projects include the existing DPV1, existing pipelines, existing and planned utility scale solar projects, substation construction and expansions, and the future expansion of the communities and roadways within the analysis area.

Increases in commercial activity in and near the CEA would include construction and operation of electrical generation facilities. These would increase noise levels in the immediate vicinities of these activities. Noise caused by the construction of the Proposed Action or Action Alternatives combined with present and reasonably foreseeable noise effects in and near the CEA would be minor.

4.12.11.1 Zone-Specific Cumulative Effects

East Plains and Kofa Zone

The development of the various large-scale energy facilities, such as the potential La Paz County land conveyance for solar development, would likely result in moderate short-term noise impacts during construction. If construction of the solar facility occurred simultaneously with the Project, there would be a cumulative increase in noise during that time. The Project when combined with past, present, and reasonably foreseeable projects in the East Plains and Kofa Zone portion of the CEA would contribute minor to moderate short-term noise impacts.

Quartzsite Zone

The development of the Plomosa 9 Placer Claim operations and the Quartzsite Wastewater Treatment Plant expansion operations would create long-term minor noise impacts in the CEA, approaching moderate impact levels at only the closest residences. Construction of the Project in the vicinity of these projects would contribute a cumulative increase in noise during that time. The Project when combined with past, present, and reasonably foreseeable projects in the Quartzsite Zone portion of the CEA would contribute minor to moderate short-term noise impacts.

Copper Bottom Zone

The West Port Gold Project mining operations would create long-term minor noise impacts in the CEA, approaching moderate impact levels at only the closest residences. Construction of the Project in the vicinity of these projects would contribute a cumulative increase in noise during that time. The Project when combined with past, present, and reasonably foreseeable projects in the Copper Bottom Zone portion of the CEA would contribute minor to moderate short-term noise impacts.

Colorado River and California Zone

The development of the various power facilities, such as the Blythe Energy Power Plant/Sonoran Energy Project, Blythe Mesa Solar Project, Desert Quartzite Solar Project, and Crimson Solar project, would result in moderate short-term noise impacts during construction, especially if they were constructed concurrently. The Project when combined with past, present, and reasonably foreseeable projects in the Colorado River and California Zone portion of the CEA would contribute minor to moderate short-term noise impacts.

4.12.12 Irreversible and Irretrievable Commitment of Resources

While there would be a limited amount of loss of lower ambient noise levels during Project operation, there would not be any irreversible or irretrievable commitment of resources from the implementation of the Project, as ambient soundscapes would be restored after Project decommissioning.

4.12.13 Relationship of Short-term Uses and Long-term Productivity

The Project would cause some short-term ambient noise level increase during the construction of the transmission line, SCS, and ancillary facilities. This increase in ambient noise would be reduced through the use of built-in design features, incorporated BMPs, and APMs. Long-term impacts would be negligible because operation of the Project would not create noise that would exceed any standard. Therefore, no effects on the maintenance and enhancement of long-term productivity related to noise would occur because of the implementation of the Project.

4.13 HAZARDS AND HAZARDOUS MATERIALS

4.13.1 Introduction

Certain chemicals and materials that would be used during the Project are characterized as hazardous materials. Hazardous materials, wastes, and regulated, nonhazardous solid wastes are governed by the laws, regulations, and policies discussed in Chapter 3. This section describes the potential impacts to human health and the environment from preexisting hazardous materials that may be present along the Project analysis area and from hazardous materials used or generated during construction and decommissioning (which would be the same as construction), or during operation and maintenance of the Project. For the purposes of this analysis, the term hazardous materials includes designated hazardous materials, regulated materials, petroleum products, and other contaminants.

The primary impact from the use of hazardous materials during construction would be from leaks and spills and potential effects to workers and the public, as well as potential contamination of surrounding soils, the atmosphere, surface waters, and groundwater. The section also addresses how potential dangers would be mitigated.

4.13.2 Methods for Analysis

4.13.2.1 Analysis Area

The hazardous materials analysis area is defined as a 1-mile corridor encompassing the Proposed Action and Alternative Segments, which is assumed to include the extent of potential new Project-related disturbance areas.

4.13.2.2 Assumptions

The analysis assumes that all the appropriate design features, APMs, and BMPs would be implemented (Appendix 2A). In addition, a Hazardous Materials Mitigation Sequence has been developed by the applicant and is included below under Section 4.13.6.

The following factors were assumed when identifying hazardous materials sites that could impact or be directly impacted by the Project, hazardous materials potentially used or stored during construction and operation/maintenance of the Project, and the effects of those elements on human health and the environment. It should be noted that many of these elements are required by law, and the plans merely collect the requirements into a plan structure. The distinction is important, as legal requirements are mandatory and enforceable by regulatory agencies. They are also not mitigation, as they are legal requirements.

- A Project-specific Hazardous Materials Management Plan (HMMP) would be developed prior to construction. The HMMP would outline proper hazardous materials use, storage, and transport requirements, as well as applicable handling procedures. The HMMP would identify the types of hazardous materials to be used during the Project and the types of hazardous wastes that are expected to be generated. All debris generated during Project-related demolition of structures, buildings, asphalt, or concrete-paved surface areas would be managed in a manner that would minimize risks to workers, the public, and the environment. Waste materials determined to be regulated material or hazardous waste would be recycled or disposed of at a permitted hazardous waste management facility. Used oil would be sent offsite for recycling, reuse, or proper disposal. Containers used to store hazardous would be properly labeled and maintained in good condition. Construction and operations and maintenance personnel would be provided with project-specific training to safely manage hazardous materials and hazardous wastes. In addition to training, each work crew would have basic hazmat cleanup materials onsite for immediate use.
- Any locations needed for the Project that involve the purchase or long-term leasing of land, purchased transmission line ROWs, and any other property to be acquired would be screened for environmental liabilities to determine the probability of contaminants of concern or other environmental impairment. An ASTM Standard E 1527-13 (or equivalent) Phase I Environmental Site Assessment would be conducted if necessary. Additional actions may include further assessment, characterization, remediation, or selection of alternative property.

4.13.2.3 Environmental Effect Indicators, Magnitude, and Duration

Impacts would result from hazardous materials use or creation of solid wastes if any of the following were to occur during the Project:

- Any handling, transport, use, containment, or disposal of hazardous materials that would violate any local, state, or Federal regulations or create a long-term health risk;
- Improper storage or disposal of solid or sanitary waste generated by the Project that would pose a threat to public health or the environment;

- Spills or releases of hazardous materials, hazardous substances, or oil/petroleum products at or above reportable quantities area that would pose a threat to public health and safety or the environment;
- Impaired implementation of or interference with an adopted emergency hazardous materials spills response plan or emergency evacuation plan;
- Hazardous emissions or the handling of hazardous materials, substances, or waste within 0.25-mile of an existing or proposed school;
- Creation of a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Locating facilities on a site that is included on a list of hazardous materials sites compiled pursuant to California Government Code Section 65962.5 and, as a result, creating a significant hazard to the public or the environment;
- For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, if the project would result in a safety hazard for people residing or working in the project area;
- For a project within the vicinity of a private airstrip, if the project would result in a safety hazard for people residing or working in the project area;
- Increased exposure of humans or the environment to potentially hazardous levels of chemicals due to the disturbance of contaminated soils or to the discharge or disposal of hazardous materials into soils;
- Exposure of people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands;
- Mobilization of contaminants in the soil or groundwater, creating potential pathways of exposure to humans or wildlife that would result in exposure to contaminants at levels that would be expected to be harmful; or
- Exposure of workers to contaminated or hazardous materials at levels in excess of those permitted by the Federal OSHA in CFR 29, Part 1910, and Cal/OSHA in CCR Title 8, or expose members of the public to direct or indirect contact with hazardous materials from proposed project construction or operations.

4.13.3 No Action Alternative

Under the No Action Alternative, no ROW would be granted for the Project and the transmission line, SCS, and ancillary facilities would not be constructed. Hazards and hazardous materials in the analysis area would continue to be managed they are currently. There would be no Project-related changes that would alter hazards and hazardous materials beyond current conditions.

4.13.4 Construction of Action Alternative Segments

4.13.4.1 Direct and Indirect Effects Common to All Action Alternatives

The implementation of the Project would result in the use of regulated and hazardous materials and creation of solid waste during construction. The specific chemicals and materials, and their quantities, have not yet been determined. A "hazardous material," as defined by the USEPA, is any physical, biological, or chemical item, which has the potential to cause harm to living organisms or the environment. Examples of regulated or hazardous materials associated with construction, operations, and decommissioning activities could include solvents, petroleum products (i.e., fuels, lubricants, oils, degreaser, etc.), paint, wood-treated products, detergents, sanitary waste, and other products typically associated with construction sites. Hazardous materials may also include pesticides (i.e., insecticides, fungicides, herbicides, rodenticides, etc.), and wash water associated with these products. Solid wastes may include paper, wood, metal, and general trash. With adherence to laws, ordinances, and regulations, as well as implementation of the APMs and BMPs described in Appendix 2A, Section 2A.9 and in the "Analysis Assumptions" above, there would be negligible impacts from construction-related hazardous materials. Use of rodenticides is prohibited in the CDCA Plan area where Focus and BLM sensitive species (including Mojave desert tortoise, Mojave fringe-toed lizard, and desert kit fox) are known or suspected to occur (BLM 2016a).

Transformers are filled with insulating mineral oil. PCBs are no longer used in transformers. Containment structures are required to prevent equipment oil from getting into the ground or water bodies in the event of a rupture or leak. A Spill Prevention, Control, and Countermeasures (SPCC) Plan would be developed for the Project in conjunction with the operating utility as required. With adherence to laws, ordinances, and regulations, as well as the implementation of the APMs and BMPs described in Appendix 2A, Section 2A.9 and in the assumptions above, there would be negligible impacts from the use of oil-filled transformers.

Sulfur hexafluoride under pressure is used as an insulator in gas-insulated switches. Though it is nontoxic and largely inert, it is considered to be an extremely potent GHG. Small amounts of SF_6 could leak over time, resulting in emissions of this gas. DCRT would follow APMs, BMPs, and other protocols to reduce the potential for GHG emissions, including (1) ensuring that only knowledgeable personnel handle SF_6, and (2) implementing SF_6 recovery and recycling. Because the gas is nontoxic and inert, and because the protocols described above would be implemented, the potentially small amount of gas leaked over time would have no measurable impact on human health or the environment.

As described in Chapter 3, several sites in and adjacent to the analysis area are listed in databases indicating past, current, or potential contamination, before the purchase of property or any construction activity, due diligence would be exercised in screening and evaluating these properties for existing environmental conditions as described in the Hazardous Material Mitigation Sequence, and appropriate measures would be taken to ensure that no contaminants are released or exposed. Therefore, these existing sites would have negligible impact on human health or the environment.

A number of USTs exist in the vicinity of the Project, some of which may be leaking or may have leaked in the past. However, because groundwater is generally deep along the Project (Sections

3.19 and 4.19), the relatively shallow excavations for structure footings are unlikely to intersect any potential groundwater plumes. Therefore, USTs would not have an effect on any of aspects of the Project.

The Project would not impair or impede implementation of, or physically interfere with, an adopted emergency hazardous materials spill response plan or emergency evacuation plan. Structures would not be located in roadways or block transportation routes. Therefore, no impacts to adopted emergency hazardous materials spill response plans or emergency evacuation plans are anticipated.

APMs and BMPs for the Project (Appendix 2A, Section 2A.9) include APM-HAZ-01, the implementation of the BLM's Hazardous Substance and Emergency Response Procedures on BLM lands. These procedures identify methods and techniques to minimize the exposure of the public and site workers to potentially hazardous materials during all phases of Project construction through decommissioning. APM-HAZ-01 is believed to be adequate to address all potential concerns currently identified, including hydrocarbons, agricultural chemicals, and natural gas facilities. APM-HAZ-02, Fire Avoidance and Suppression, ensures that workers will minimize the risk of igniting wildfires through their actions. The presence or discovery of any unexploded ordnance (UXO) on the YPG would be addressed using protocols described in BLM Handbook H-1703-2, "Military Munitions and Explosives of Concern: A Handbook for Federal Land Managers, with Emphasis on Unexploded Ordnance" (BLM and USFWS 2006).

With adherence to the laws, ordinances, regulations, and standards described in Chapter 3, implementation of the APMs and BMPs described in Appendix 2A, Section 2A.9, and implementation of safety-related plans and programs to ensure safe handling, storage, and use of hazardous materials, none of the potential impacts described above would occur during construction of the Project. No violations of local, state, or Federal regulations or long-term risks to human health or the environment are anticipated from handling, transport, use, containment, or disposal of hazardous materials during construction of the Project. The MMs referenced above would be implemented to prevent spills and leaks of hazardous materials and provide for adequate containment and cleanup if spills and leaks do occur.

Impacts during construction would be the same for all zones, thus each zone is not described separately for hazardous materials. That is, with adherence to the laws, ordinances, regulations, and standards described in Chapter 3, implementation of the APMs and BMPs described in Appendix 2A, Section 2A.9, and implementation of safety-related plans and programs to ensure safe handling, storage, and use of hazardous materials, none of the impacts described above would occur during construction of the Project. The MMs referenced above would ensure negligible impacts from hazardous materials as a result of the construction of the Project.

4.13.5 Operations, Maintenance, and Decommissioning

All direct and indirect effects common to all Action Alternatives for construction, as described in Section 4.13.5.1, would apply to the operations, maintenance, and decommissioning phase, except that very little, if any, additional disturbance would be anticipated during this phase of the project. Therefore, a much lower potential for a release of hazardous materials would be expected.

4.13.6 Mitigation Measures

Mitigation measures to prevent and minimize exposure to hazardous materials, should they become necessary, are described in Chapter 2. Additional mitigation is expected to be developed for the HMMP prior to construction. All MMs would apply to any of the Action Alternatives.

DCRT developed the following Hazardous Materials Mitigation Sequence (MM-HAZ-01) to ensure that no existing contaminated sites along the Project route would be disturbed during construction in a manner that adversely impact human health or the environment:

Hazardous Materials Mitigation Sequence

Resource studies establishing baseline conditions for the Project included a screening-level assessment of hazardous materials sites within a 1-mile wide study area encompassing the Proposed Action and Alternative Segments. The screening consisted of searching over 50 government and private databases, including lists specified in California's Government Code Section 65962.5. These databases included the EPA Hazardous Materials Incident Report System, the California "Cortese" Hazardous Waste and Substances Sites List, and the Federal listing of Unexploded Ordnance Sites. No mapped "Superfund" sites or sites on the National Priorities List were documented; however, multiple industrial, commercial, mining, and other potentially contaminated sites are located within the hazardous materials study area.

Results of this screening would be used to guide the continued development of Project design, including structure placement locations within a corridor along the selected route, and where other Project-related ground disturbing activities occur outside of the corridor which could include lay-down areas, pulling stations, and access sites. DCRT would implement the following mitigation sequence to avoid or minimize the potential for hazardous materials-related impacts to construction workers, the public, and the environment:

1. A 600-foot corridor (300 feet on either side of the centerline of the potential alignment) along the selected route would be evaluated to identify locations where hazardous materials sites (for example, contaminated soils or buried waste) are potentially present. Areas outside of the corridor, including access roads, where Project construction-related ground disturbance could occur would also be evaluated, including a 100-foot buffer. The evaluation would be conducted by individuals trained in Phase I and II Environmental Site Assessments as presented in ASTM E1527-13. This evaluation would consist of an in-depth review of the information obtained during the initial screening described above, and may include contacting agency staff, review of aerial photographs, and windshield surveys as appropriate.
2. Sites that are identified within the 600-foot selected route study corridor and ancillary sites where Project construction-related ground disturbance could occur through the activities described above in # 1, where a release has occurred, would be subject to a Phase I Environmental Site Assessment in accordance with ASTM E1527-13.
3. Final Project design and construction plans would take into consideration the results of the Phase I Environmental Site Assessment, with the intent to avoid identified hazardous materials sites through the micrositing process. If a confirmed contamination site can be avoided, it would be and no further action would be indicated.

4. If a hazardous materials site identified during the Phase I Environmental Site Assessment cannot be avoided through micrositing of structures, and the site presents the potential for impacts to the public, Project workers, or the environment, a Phase II Environmental Site Assessment (in accordance with ASTM E1903) would be conducted as appropriate.
5. Depending on the results of the Phase II Environmental Site Assessment, measures may need to be implemented in order to proceed with Project construction. Given the types of hazardous materials sites most likely to be present based on the initial screening, MMs could include, but may not necessarily be limited to, the following:
   - Perform all excavation at the subject site under the direction of a qualified environmental professional who would field-screen soils for contamination and debris. Soils or other media showing indications of contamination based on field screening instruments, analytical sample results, or visual or olfactory observations would be disposed of and treated in a manner to be approved by the BLM and/or the appropriate state agency.
   - Collect samples for chemical analysis as appropriate to characterize the material for disposal.
   - Transport and dispose of any excavated contaminated soils or debris at an approved facility or treat on site.
   - Conduct all site work under a health and safety plan that meets OSHA requirements, including requirements for working training and personal protective equipment.
   - UXOs would be treated per BLM Handbook H-1703-2.

Further, the applicant has committed to APMs, and the BLM developed required BMPs, that would further reduce impacts to hazards and hazardous materials (Appendix 2A, Section 2A.9).

4.13.7 Construction of Full Route Alternative and Subalternative Effects

4.13.7.1 All Action Alternatives

The extent of Federal, state, and local laws, regulations and ordinances pertaining to hazardous materials and their treatment, added to the APMs, BMPs, mitigation and management plans, reduces the potential for a release from mishandling of hazardous materials to a negligible level for all full route alternatives and applicable subalternatives. These would include APM-HAZ-01, APM-HAZ-02, BMP-HAZ-03, the HMMP, and the Hazardous Materials Mitigation Sequence.

4.13.8 Residual Impacts

With adherence to laws, ordinances, regulations, and standards, implementation of the APMs and BMPs described in Chapter 2, and implementation of safety-related plans and programs to ensure safe handling, storage, and use of hazardous materials, no residual impacts are anticipated from preexisting hazardous materials or the use of hazardous materials under any of the Action Alternatives. No residual impacts would be anticipated to occur during the Project. as MMs would be implemented to prevent spills and leaks of hazardous materials and provide for adequate containment and cleanup if spills and leaks do occur.

4.13.9 CDCA Plan Compliance

CMAs LUPA-BIO-9, LUPA-SW-6, LUPA-SW-7, and DFA-VPL-BIO-FIRE-1 would apply to the Project (Appendix 2C). The Project would comply with these CMAs through APM-HAZ-01 and APM-HAZ-02, and BMP-HAZ-03 (Appendix 2A).

4.13.10 Unavoidable Adverse Effects

With adherence to laws, ordinances, regulations, and standards and the implementation of the AMPs and BMPs described in Chapter 2 and in Section 4.13.7 no unavoidable adverse impacts are anticipated from preexisting hazardous materials or the use of hazardous materials under any of the Action Alternatives. No unavoidable adverse impacts would be anticipated to occur during Project as MMs would be implemented to prevent spills and leaks of hazardous materials and provide for adequate containment and cleanup if spills and leaks do occur.

4.13.11 Cumulative Effects

The CEA for hazardous materials and hazardous and solid waste includes a 2-mile buffer surrounding the Proposed Action and Alternatives, a total of 711,573 acres (Appendix 1, Figure 3.20-1). Past and present activities that generate hazardous materials and/or hazardous and solid waste have included mining, residential development, road and utility development (i.e., natural gas pipeline), energy development (i.e., substations, power plants, transmission lines), and military installments. Sites shown on agency databases for hazardous materials include mines, roads, military installations, energy-related generation and transport, and other activities. Active pipelines are among the current activities that carry petroleum products. Disturbance of sites containing potentially hazardous materials, or generation of hazardous waste through construction activities for the Project, have the potential to increase hazardous materials and wastes within the CEA resulting in potential cumulative effects. However, given the APMs, BMPs, and mitigations, cumulative effects for hazardous materials are anticipated to be less than major.

Reasonably foreseeable generators of solid and/or hazardous waste in the CEA include the construction/development of the Plomosa 9 Placer Claim mine, West Port Gold Project, the Blythe Energy Power Plant/Sonoran Energy Project, and several solar projects (Table 3.20-6). All construction projects would be required to comply with all local, state, and Federal regulations relevant to the handling and disposal of all wastes.

All solid and hazardous wastes generated during the construction phase and during the operations phase of the Project would be transported to licensed facilities off-site for treatment and disposal. There are several facilities in proximity to the Project including the La Paz County landfill, Lone Cactus landfill, Sickles Sanitation landfill, and Northwest Regional landfill in Maricopa County, among others, and the Corona landfill in Riverside County. In the context of existing and reasonably foreseeable solid and hazardous waste generation locally and regionally, the Project would constitute a minor increase in waste generation and management, well within existing capacities and infrastructure.

Given the existing capacity and regulatory framework for waste generators, transporters, and treatment, storage, and disposal facilities, the Project in combination with the other reasonably foreseeable projects and activities would have minor cumulative effects on solid and hazardous waste generation and management. The Project would comply with all local, state, and Federal regulatory requirements.

4.13.11.1 Zone-Specific Cumulative Effects

East Plains and Kofa Zone

Within the East Plains and Kofa Zone portion of the CEA, the existing Plomosa Mine Quarry, Harquahala Power Plant, the El Paso Natural Gas Pipeline, and DPV1 and other transmission lines (Table 3.20-5), in addition to reasonably foreseeable future projects such as the La Paz County land conveyance for a solar facility (Table 3.20-6), have the potential to cumulatively contribute hazardous materials or generate hazardous waste. The Project would be a negligible contribution to cumulative effects on solid and hazardous waste generation and management.

Quartzsite Zone

Within the Quartzsite Zone portion of the CEA, the El Paso Natural Gas Pipeline, DPV1, and other transmission lines (Table 3.20-5), in addition to reasonably foreseeable future projects such as Plomosa 9 Placer Claim Mine and the Quartzsite Wastewater Treatment Plant renovation/expansion (Table 3.20-6), have the potential to cumulatively contribute hazardous materials or generate hazardous waste. The Project would be a negligible contribution to cumulative effects on solid and hazardous waste generation and management.

Copper Bottom Zone

Within the Copper Bottom Zone portion of the CEA, the El Paso Natural Gas Pipeline, DPV1 and other transmission lines, Ehrenberg Wash Pit, and the YPG (Table 3.20-5), in addition to reasonably foreseeable future projects such as the West Port Gold Mine (Table 3.20-6), have the potential to cumulatively contribute hazardous materials or generate hazardous waste. The Project would be a negligible contribution to cumulative effects on solid and hazardous waste generation and management.

Colorado River and California Zone

Within the Colorado River and California portion of the CEA, the Blythe Energy Center, the El Paso and Sempra-Southern California natural gas pipelines, DPV1 and other transmission lines, numerous solar facilities (Table 3.20-5), in addition to reasonably foreseeable future projects such as the Blythe Energy Power Plant/Sonoran Energy Project and several solar facilities (Table 3.20-6), have the potential to cumulatively contribute hazardous materials or generate hazardous waste. The Project would be a negligible contribution to cumulative effects on solid and hazardous waste generation and management.

4.13.12 Irreversible and Irretrievable Commitment of Resources

With adherence to laws, ordinances, regulations, and standards and the implementation of the APMs and BMPs described in Appendix 2A, there would be no irreversible commitment of resources caused by the use of hazardous materials. APMs and BMPs would be implemented to prevent spills and leaks of hazardous materials and provide for adequate containment and cleanup if spills and leaks do occur.

4.13.13 Relationship of Short-term Uses and Long-term Productivity

With adherence to laws, ordinances, regulations, and standards and the implementation of the APMs, the productivity of the ROW would not be affected by the use of hazardous materials. The MMs would be implemented to prevent spills and leaks of hazardous materials and provide for adequate containment and cleanup if spills and leaks do occur.

4.14 PUBLIC HEALTH AND SAFETY

4.14.1 Introduction

Potential effects to public health and safety are discussed in terms of general health and safety, fire, EMF, and intentional acts of destruction.

4.14.2 Methods for Analysis

4.14.2.1 Analysis Area

The study area for general public health and safety, inclusive of intentional acts of destruction, is a 4,000-foot wide corridor encompassing the Proposed and Alternative segments. Given the broad range of issues potentially associated with the Project, a 4,000-footwide corridor is sufficient to capture the potential health and safety issues that may come into play due to the Project. The general public health and safety study area encompasses access roads, the SCS, and ancillary facilities.

The study area for the assessment of fire and fuels management includes lands that may be affected by Project construction and operation, and areas within 1 mile of the Proposed and Alternative segments, including associated substations and staging areas. This area encompasses the Delaney and Colorado River substations, permanent and temporary access roads, and staging areas. A 2-mile-wide study area was selected for fire and fuels management to allow these topics to be assessed in areas where there are errors or ambiguities in the recorded locations and boundaries of fires or other incidents, and also due to the unpredictable nature and extent of fires.

The study area for the assessment of EMF is based on an analysis of electric and magnetic field strengths at the center and at the edge of the 200-foot-wide ROW as well as an area extending 100 feet on each side of the ROW.

4.14.2.2 Assumptions

The analysis assumes that all appropriate design features, APMs, BMPs, and any additional monitoring and MMs identified for public health and safety issues for the Project would be implemented.

Federal, state, county laws, ordinances, rules, and regulations govern permitted activities that may affect sensitive receptors or workers during construction of the Project. Many of the laws, regulations, and standards relevant to public health and safety are included in other reports written for this Project such as noise, groundwater contamination, hazardous waste management, and air quality. Specific requirements for the protection of transmission lines and substations are not codified by law; therefore, Federal and state agencies and utility companies use best management practices such as industry-standard physical deterrents (e.g., fencing, cameras, warning signs, rewards, etc.) to help deter theft, vandalism, and unauthorized access to facilities. This analysis assumes that an intentional act of destruction from vandalism and theft would not pose a threat to public health and safety and is therefore not analyzed. Acts of sabotage or terrorism could potentially damage areas adjacent to the transmission line, SCS, and/or ancillary facilities and could potentially disrupt service to the public, including critical services such as emergency response, hospitals, and communications.

4.14.2.3 Environmental Effect Indicators, Magnitude, and Duration

Indicators to determine if impacts to public health and safety would potentially occur from the Project include:

- Amounts and types of hazardous materials; number of workers and sensitive receptors within analysis area;
- Average number of severe occupational accidents/deaths annually and over life of a project from transmission line accidents, including electrocution.
- Number of non-occupational electrocutions annually from contact with transmission lines per mile of transmission line (if possible);
- Exposure of workers, residents, or visitors to valley fever from inhalation of *coccidioides* spores in Project soils during construction;
- Project-area severe weather, fire, and lightning strike statistics; transmission line failure rate per mile;
- Vehicle accident rates within the study area;
- Impairment of implementation of or physical interference with an adopted emergency response plan or emergency evacuation plan;
- Exposure of people or structures to a significant risk of loss, injury or death involving electrocution or cause excessive exposure to wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands;
- Impede, interfere with, or compromise operations at the YPG (also see Sections 4.8 and 4.10);
- Result in safety hazards to people that may be located in the vicinity of private air strips or airports located within 2 miles of the Project; or
- Exposure of people to significant hazards or expose structures to loss as a result of intentional destructive acts.

Units to measure change to public health and safety in general include:

- Lightning strikes per year per acre; and
- Injury rate (worker-incidents per year; accidents per vehicle-mile traveled).

In terms of fire specifically, indicators to determine if potential impacts could result from the Project include:

- A history of wildfire in the study area, including (as available) history of ignitions (natural and anthropogenic);
- Existing fuel conditions that make the study area susceptible to wildfire;
- History of transmission line fires and those that resulted in wildfire (as available);
- Fire department/agency demands associated with transmission line fires and role of existing transmission lines affecting fire agency response capability (e.g., aerial obstruction); and
- Close proximity of the Project and public development to fire-prone open space.

For the purposes of this analysis, impacts of fire could result if any of the following were to occur from the Project:

- Construction, operation, maintenance, and decommissioning of the Project would create an unsafe working environment that cannot be mitigated through the use of APMs, BMPs, and other required safety measures. Injuries or fatalities during construction would be expected to be above the industry averages; and
- Construction, operation, maintenance, and decommissioning of the Project would increase the risk of fire.

In terms of EMF, impacts could result if any of the following were to occur from construction, operation, maintenance, and decommissioning of the Project:

- Levels of electric field, magnetic field, and audible noise (i.e., corona noise [Section 4.12]) that pose a threat or nuisance to public health and safety;
- EMF generated by the Project would expose the public to EMFs that are greater than guidelines proposed by the ICNIRP, the IEEE, and the ACGIH.

Units to measure change to public health and safety from EMF include:

- Electric fields (volt per meter [v/m]); and
- Magnetic fields (mG).

It is not possible to predict whether an intentional act of destruction would occur, what kind of intentional act of destruction would occur, or the magnitude of damage that could be incurred from an intentional act of destruction on the existing and proposed electrical infrastructure. Therefore, no impact indicators are appropriate for the analysis of intentional acts of destruction. Instead, the following analysis describes the potentially affected areas and critical services that could be directly and indirectly impacted by an act of sabotage or terrorism on the electrical facilities, should one occur.

- Indirect damage to areas immediately adjacent to the proposed transmission line, SCS, and/or ancillary facilities where an act of sabotage or terrorism has occurred; and
- Disruption of service to the general public and critical services.

Impacts to public health and safety may be negligible, minor, moderate, or major, and may have durations that are qualified as temporary, short term, or long term (Table 4.1-1, Section 4.1).

4.14.3 No Action Alternative

Under the No Action Alternative, no ROW would be granted for the Project and the transmission line, SCS, and ancillary facilities would not be constructed. The BLM-administered land on which the Project is proposed would continue to be managed as it currently exists. Lands in the analysis area would remain as is, which is primarily undeveloped desert land available for dispersed and developed recreation, subject to existing closures or restrictions. Existing levels of EMF, fire risks, and overall public health and safety from existing conditions would be unchanged by the Project.

Acts of sabotage and terrorism on electrical facilities have been rare; however, threats to the existing electricity infrastructure from sabotage and terrorism would continue to be a possibility under the No Action Alternative. Because of the generally rural setting of the majority of the study area, an act of sabotage or terrorism on existing electricity infrastructure would have a negligible impact to adjacent land. However, developed areas adjacent to electrical infrastructure (i.e., Blythe, Quartzsite) would continue to have a threat of being impacted by an act of sabotage or terrorism.

4.14.4 Construction of Action Alternative Segments

4.14.4.1 Direct and Indirect Effects Common to All Action Alternatives

The locations of sensitive receptors within the analysis area for the Proposed and Alternative segments are listed in Table 4.14-1. A sensitive receptor is defined as a single home, mobile home, or building that could include a nursing home, hospital, or daycare center, as well as schools and churches.

Table 4.14-1 Project Segments with Identified Sensitive Receptors

ZONE	SEGMENT	SENSITIVE RECEPTORS	LOCATION
Quartzsite	qn-02	80	Residences and Quartzsite Alliance Church in Quartzsite
Quartzsite	qs-01	251	Residences including La-Z Daze Trailer Park and Rice Ranch RV Park, the Church of Jesus Christ of Latter-day Saints, and La Posa LTVA in Quartzsite, Arizona
Quartzsite	qs-02	54	Residences including Desert Gardens RV Park and a Super 8 Hotel in Quartzsite, Arizona
Quartzsite	x-06	Variable; thousands per year	Adjacent to La Posa LTVA; the number and location of potential sensitive receptors changes over time

ZONE	SEGMENT	SENSITIVE RECEPTORS	LOCATION
Quartzsite	x-07	Variable; thousands per year	Through La Posa LTVA south of Quartzsite, Arizona; the number and location of potential sensitive receptors changes over time
Colorado River and California	p-15w	8	Rural residential area near Ripley, California
Colorado River and California	x-09	2	Residences along the Colorado River in Blythe, California
Colorado River and California	x-10	63	Residences along the Colorado River in Blythe, California
Colorado River and California	x-11	8	Residences along the Colorado River in Blythe, California
Colorado River and California	x-12	2	Rural residential area southwest of Blythe, California
Colorado River and California	x-13	2	Rural residential area near Blythe, California
Colorado River and California	ca-01	8	Rural residential area south of Blythe, California
Colorado River and California	ca-02	1	Rural residential area south of Blythe, California
Colorado River and California	ca-05	21	Rural residential area near the Cyr airfield near Blythe, California
Colorado River and California	ca-06	3	Rural residential area near Blythe, California

As identified in Table 4.14-1, receptors are located in proximity to one Proposed segment in California (p-15w) and 13 Alternative segments in California and Arizona, and are generally located in or near Quartzsite and Blythe, within two identified zones: Quartzsite Zone and Colorado River and California Zone.

General Health and Safety

Certain construction, operation, and decommissioning activities may create impacts for workers and nearby residents. In addition, during construction hazardous waste or materials may be discovered. As defined in Section 49-921 of the ARS, hazardous waste is means "garbage, refuse, sludge from a waste treatment plant, water supply treatment plant or air pollution control facility, or other discarded materials, including solid, liquid, semisolid or contained gaseous material, resulting from industrial, commercial, mining and agricultural operations or from community activities which because of its quantity, concentration or physical, chemical or infectious characteristics may cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness or pose a substantial present or potential hazard to human health or the environment if improperly treated, stored, transported, disposed of or otherwise managed or any waste identified as hazardous pursuant to section 49-922" (ARS § 49-921, 2015). In Section 25501(p) of the California Health and Safety Code, hazardous material is defined as "any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. Hazardous materials include, but are not limited to, hazardous substances, hazardous waste, and any material that a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment" (CA Health & Safety Code § 25501 [through 2012 Legislative Session]).

The Project's worker environmental awareness program would be used to communicate environmental issues and appropriate work practices specific to this Project. This awareness would include proper implementation of BMPs as described in Section 4.13. The training would emphasize site-specific physical conditions to improve hazard prevention (such as identification of flow paths to nearest water bodies) and would include a review of all site-specific water quality requirements, including applicable portions of erosion control and sediment transport BMPs, Health and Safety Plan (to be completed before a NTP would be issued), and Hazardous Substance Control and Emergency Response Plan (to be completed before a NTP would be issued).

Vehicle and equipment fueling and maintenance operations would be conducted in designated areas only; these areas would be equipped with appropriate spill control materials and containment.

Workers in the Project Area can be at risk of electrical shock and/or electrocution while working on an energized system. The construction industry, as an industry group, sustained 52 percent of all fatal electrical accidents from 2003 to 2010. The construction industry had the highest rate of non-fatal electric shock injuries at 0.6 case per 10,000 workers (Electrical Safety Foundation International 2016). Since 1992, electric-related fatalities have decreased by more than 50 percent, while injuries are down more than 60 percent. Improvements to worker safety are attributed to improved electrical safety standards and training of workers in high-risk occupations (Electrical Safety Foundation International 2016). Thus, the Project's worker Health and Safety Plan (to be completed before NTP would be issued) would be used to communicate awareness to workers of working around electricity. The Project would be designed, constructed, and operated in accordance with all applicable health and safety acts, regulations, and laws to minimize risks to workers.

Traffic-related accidents are another potential risk during construction because of increased traffic and large, slow-moving equipment on roads. The risk increases on roads with higher traffic volumes, such as I-10, or near residential communities. Risk is increased between November and March when there are more seasonal visitors. Most areas in the Project Area would not experience an increase in traffic hazards because much of the area is relatively sparsely populated and does not experience high traffic volumes. Traffic control measures may be required to reduce potential traffic hazards.

In certain areas, herbicides may be used on public ROWs or in agricultural areas. Herbicides are generally used to control invasive species and naturally occurring weeds and, when applied correctly according to US EPA approved labels, typically do not cause issues with human health.

Workers, residents, or visitors to an area under construction have the potential to contract valley fever from exposure to disturbed soils that may contain the *coccidioides* fungus (Section 4.3.4.1 Soil Resources, Soil Hazards). Soil disturbance for structure construction, road building, and various work and staging areas would locally increase valley fever risk. APM-AQ-01, BMP-AQ-01, and APM-AQ-04 (Appendix 2A, Section 2A.1) would minimize the risk of exposure to valley fever for workers and the public as a result of Project construction to a minor, short-term effect.

As noted in Section 4.10.4, construction of the Project would not permanently preclude the use of or access to existing recreation opportunities or activities, rather some short-term impacts to these resources would occur during the construction phases of the Project. Therefore, there could be an increased public health and safety risk to OHV users during construction if posted restrictions are not followed. Some unauthorized OHV use could occur during construction when workers are not present (such as on weekends or in between construction phases).

Based on this information and considering that construction impacts would be of limited duration (short term), direct and indirect impacts to public health and safety in general during construction are expected to be negligible (i.e., no measurable change in current conditions) to minor in magnitude (i.e., a small, but measurable change in current conditions).

<u>Fire</u>

In terms of fire, a number of historical fires have been recorded in the study area and could occur within the Project Area as described in Chapter 3, Table 3.14-2.

Previous fires in the study area between 1982 and 2015 were primarily classified as human-caused, with the majority located along the I-10 corridor and around Blythe. A large portion of the fires occurred due to equipment use and debris burning, with fewer being caused by campfires, smoking, or arson. One incident was classified as caused by a power line.

Fire activity in the southwestern US increases in the spring, because the weather transitions from windy and dry to hot and dry, primarily between March and September with the peak fire activity occurring between mid-May and mid-July (NWCG 2014). Wildfire history is closely related to climatic patterns and vegetation (BLM 2016r).

Primary concerns with regard to the Project increasing the risk of wildland fire include weather conditions (temperature, humidity, wind, and lightning), potential fire ignition sources, the presence and condition of fuels (vegetation), and associated fire regimes. Certain construction activities such as blasting and welding could increase the risk of fire. Blasting would be required for areas where substantial hard rock is encountered and not able to be removed with excavators. Blasting could be used for construction of structure footings or access roads. Welding would be required to construct the bus sections used for the conductors in the SCS.

During construction, operations, and decommissioning, activities such as refueling, welding, or blasting, and sparks from vehicles and other equipment could cause fires. Fuel and ignition sources would be addressed through vegetation management, fire prevention practices, planning, and education provided in the construction safety program and as standard safety practices. The implementation of APMs and BMPs (Appendix 2A, Section 2A.9) would reduce the potential for public health and safety impacts that could result from fires associated with the Project. A Fire Protection Plan would be prepared for the Project.

Based on this information and considering that construction impacts would be of limited duration (short term), direct and indirect impacts to public health and safety from fire during construction are expected to be negligible (i.e., no measurable change in current conditions) to minor in magnitude (i.e., a small, but measurable change in current conditions).

EMF

Impacts from EMF during construction would not occur because the transmission line and associated facilities that would be constructed would not be transmitting electricity.

Based on this information, no direct and indirect impacts to public health and safety from EMF during construction are expected.

Intentional Acts of Destruction

An intentional act of destruction from sabotage or terrorism on the electrical infrastructure of all Action Alternatives would have the same direct and indirect impacts on public health and safety. In general, the electricity infrastructure proposed by all of the Action Alternatives could potentially be targets of an act of sabotage or terrorism. However, the addition of transmission lines and associated facilities generally strengthens the reliability of delivering electricity to the general public, because if one line is affected by an intentional act of destruction or any other disruption, other lines would be available to continue the delivery of electricity.

Lands immediately adjacent to the proposed transmission line, SCS, and/or ancillary facilities could be indirectly impacted by an act of sabotage or terrorism, should the unlikely event occur. In the rural areas, the indirect effect on adjacent land would be negligible because of the lack of development adjacent to the proposed routes. In developed areas near Blythe or Quartzsite, the indirect effect of an act of sabotage or terrorism would be the same as the existing condition, because the proposed lines would follow existing alignments. If an act of sabotage or terrorism occurred at facilities adjacent to developed areas, there would be a greater chance that public health and safety would be indirectly impacted.

Should an act of sabotage or terrorism occur on the transmission line, SCS, and/or ancillary facilities, public health and safety could be affected by a disruption of service. The general public and the critical services identified in Section 3.14 could be potentially directly impacted. However, the risk of this happening is low, considering that acts of sabotage and terrorism on electricity infrastructure are rare. Existing lines not affected by the act of sabotage or terrorism would be able to continue to deliver electricity to the affected areas, and most critical services are required to have backup generators to provide electricity when service through transmission lines is interrupted. Therefore, the unlikely impacts of acts of sabotage or terrorism would be minor and short term.

4.14.4.2 East Plains and Kofa Zone

<u>Direct and Indirect Effects Common to All Segments in the Zone</u>

As identified in Table 4.14-1, NSR were not identified along any of the segments in this zone, although wildfire threat along areas of the I-10 corridor are considered moderate to very high based on data related to wildland development area impacts, wildfire threat, and wildfire risk (AZDFFM 2017). Along I-10 where a large number of fire incidents were recorded, fires typically do not burn for long periods due to the lack of vegetation. Traffic-related accidents are another potential risk in this zone; and traffic control measures may be required to reduce potential traffic hazards.

For the reasons provided above, direct and indirect impacts to public health and safety in general, and from fire, EMF, and intentional acts of destruction, during construction, operation, maintenance, and decommissioning are expected to be negligible (i.e., no measurable change in current conditions) to minor in magnitude (i.e., a small, but measurable change in current conditions).

4.14.4.3 Quartzsite Zone

<u>Direct and Indirect Effects Common to All Segments in the Zone</u>

Segment x-07 is located along SR 95 and passes through the La Posa LTVA. Segment x-06 is adjacent to the LTVA. Various numbers of sensitive receptors may be present within the LTVA at any given time during the year, because visitors may stay for up to 7 months and records of LTVA residents are kept only for a period of 2 weeks (HDR 2017e). Therefore, an exact number of receptors cannot be provided. However, the La Posa LTVA attracts tens of thousands of visitors per year, particularly during the winter months. The other Alternative segments in this area are located along I-10 and near Quartzsite. Segments qn-02, qs-01, and qs-02 in this area include nearby receptors within the public health and safety area. Many of the potential sensitive receptors identified are residences in Quartzsite. The Church of Jesus Christ of Latter-day Saints, Quartzsite Alliance Church, RV and trailer parks, and a Super 8 hotel are included among these receptors. Segments qs-01 and qs-02 pass through the very northern portion of the La Posa LTVA as well as Quartzsite and have the potential to affect thousands of receptors.

For the reasons provided above, direct and indirect impacts to public health and safety in general, and from fire, EMF, and intentional acts of destruction, during construction, operation, maintenance, and decommissioning are expected to be negligible (i.e., no measurable change in current conditions) to minor in magnitude (i.e., a small, but measurable change in current conditions).

4.14.4.4 Copper Bottom Zone

<u>Direct and Indirect Effects Common to All Segments in the Zone</u>

As identified in Table 4.14-1, NSR were not identified along any of the segments in this zone, although wildfire threat along areas of the I-10 corridor are considered moderate to very high based on data related to wildland development area impacts, wildfire threat, and wildfire risk (AZDFFM 2017). Along I-10 where a large number of fire incidents were recorded, fires typically do not burn for long periods due to the lack of vegetation. Traffic-related accidents are another potential risk in this zone; and traffic control measures may be required to reduce potential traffic hazards.

This area has limited land development, but is crossed by the proposed Arizona Peace Trail. As described in Appendix 2A, Section 2A.9, (APMs and BMPs), plastic mesh or paint would be used to mark guy wires in these recreation areas. In areas not previously occupied by a transmission line, there could be an increased public health and safety risk to OHV users due to collision with guy markers and other Project structures. MM-REC-02 would be implemented, and in all other areas where guyed V structures are used, the anchor positions would be placed no less than 50 feet from any trail or road, and the guy wire would be at least 15 feet above (at its lowest point) any road or trail crossed by a guy wire.

These would reduce the safety risk to OHV users in the heavily recreated Copper Bottom Zone.

With mitigation, direct and indirect impacts to public health and safety in general, and from guy wires, fire, EMF, and intentional acts of destruction, during construction, operation, maintenance, and decommissioning are expected to be negligible (i.e., no measurable change in current conditions) to minor in magnitude (i.e., a small, but measurable change in current conditions).

4.14.4.5 Colorado River and California Zone

Direct and Indirect Effects Common to All Segments in the Zone

Table 4.14-2 identifies the number of NSR within approximately 1,000 feet of the segments within the Colorado River and California zone.

Table 4.14-2 Noise Sensitive Receptors within approximately 1,000 feet of Segments within the Colorado River and California Zone

ZONE	RECEPTOR TYPE	# OF NSR WITHIN APPROX. 1,000 FEET	SEGMENT
Colorado River and California	Residence	2	ca-01
Colorado River and California	Residence	1	ca-02
Colorado River and California	Residence	12	ca-05
Colorado River and California	Residence	1	ca-06
Colorado River and California	Residence	2	p-15w

The Proposed segments have a low concentration of historical fires in comparison to the northern segments; however, of all the Proposed segments, Segment p-15w had the highest concentration of historical fires.

For the reasons provided above, direct and indirect impacts to public health and safety in general, and from fire, EMF, and intentional acts of destruction, during construction, operation, maintenance, and decommissioning are expected to be negligible (i.e., no measurable change in current conditions) to minor in magnitude (i.e., a small, but measurable change in current conditions). However, the presence of people in Blythe and the surrounding areas, such as along the Colorado River and in the community of Mesa Verde, creates additional risks for fires, such as greater number of sensitive receptors, than in other less-populated areas.

4.14.5 Operation, Maintenance, Decommissioning

4.14.5.1 General Health and Safety

As noted in Section 4.10, the ROW would generally be open to recreation on public land unless specifically prohibited by the BLM or other regulatory authority (e.g., OHV use). As described in Appendix 2A, Section 2A.9 (APMs and BMPs), plastic mesh or paint would be used to mark guy wires in areas used for recreation. Permanent high visibility guy markers would be installed during construction. In areas not previously occupied by a transmission line, there could be an increased public health and safety risk to OHV users due to collision with guy markers and other Project structures. Further, trespass onto the YPG by OHV riders would pose a safety risk to both riders (collision with military equipment, exposure to military ordnance) and to military personnel.

There is a potential risk for energized equipment to adversely affect the health of individuals that trespass onto the SCS and substation properties or that interact directly with the structures; however, these effects would be limited to certain individuals and would not affect the general public. Adverse effects would be reduced by limiting access and using appropriate barriers and warning signs.

Public health issues associated with operating a transmission would also include the potential to be exposed to corona noise. The impacts associated with this were assessed in Section 4.12.

In certain areas, herbicides may be used to control weeds in the Project Area. Herbicides are generally used to control invasive species and naturally occurring weeds and, when applied correctly according to US EPA approved labels, typically do not cause issues with human health.

Based on this information, direct and indirect impacts to public health and safety in general during operation and maintenance are expected to be negligible (i.e., no measurable change in current conditions) to minor in magnitude (i.e., a small, but measurable change in current conditions).

It is expected that impacts resulting from the decommissioning process would be like the impacts during construction of the Project. Removal of the transmission line upon completion of the Project would result in relinquishing the ROW. Land previously occupied by the ROW and associated transmission line structures would be available for other land uses and the effect to the recreation experience due to the infrastructure would be removed.

4.14.5.2 Fire

During operation, fire ignition concerns could include potential equipment failures or routine operation and maintenance activities that could ignite flammable material. Electrical arcing from power lines, which can occur due to high winds causing stress failures or loose connections, can represent a fire ignition hazard. This situation is more common with low voltage distribution lines, which typically are on wooden pole structures and closer to trees and other vegetation. Statistics show that more fires start from distribution lines than from transmission lines, due to lower clearance requirements between conductors and vegetation and because there are 5 to 10 times as many miles of distribution lines as transmission lines (CAL FIRE 2008). The risk of a fire igniting because of a conductor falling from an overhead line is minimal given system protection features designed to safeguard the public and line equipment, but can occur due to bird-strike or vandalism. Safeguards include transmission line relays and circuit breakers that rapidly detect faults and cut off power to avoid shock and fire hazards.

During maintenance of transmission lines, activities such as workers smoking, refueling, welding, or blasting, and sparks from vehicles and other equipment could cause fires. Fuel and ignition sources can be addressed through vegetation management, fire prevention practices, planning, and education. Indeed, fires from power lines are extremely infrequent, as discussed above; since 1982, only one reported fire was related to a power line (Table 3.14-2**)**.

The presence of a transmission line can hinder fire containment and transmission line structures and conductors can pose a risk to firefighters. Aerial and ground firefighting may be restricted; aerial firefighting operations can be complicated because there is a risk of aircraft colliding with structures or conductors in reduced-visibility conditions. Firefighting pilots are kept apprised of the location of transmission lines because of these concerns. Ground-based firefighters can be put at risk if charged particles in heavy smoke create a short circuit or arc between an energized line and the earth, a person, or firefighting equipment. For this reason, firefighting protocols require crews to maintain certain distances from energized lines. Fire managers coordinate with utilities on shutting down lines as needed. Transmission line access roads can provide firefighting crews access to the area and these access roads can be used as potential fire breaks.

Based on this information, direct and indirect impacts to public health and safety due to fire are expected to be negligible (i.e., no measurable change in current conditions) to minor in magnitude (i.e., a small, but measurable change in current conditions).

It is expected that impacts due to fire resulting from the decommissioning process would be like the impacts during construction of the Project.

4.14.5.3 EMF

EMF (or power frequency) are invisible lines of force that you cannot feel that surround wires that carry electricity. On a daily basis people around the world are exposed to EMF as a result of using electricity. Common everyday sources of EMF are hair dryers, coffee makers, alarm clocks, computers, appliances, and power lines.

EMFs can occur together or separately and are a function of voltage and current. Electric fields are produced by voltage and increase in strength as the voltage increases. Typically, electric fields are measured in v/m. Magnetic fields occur from the flow of electrons through wires (i.e., electrical equipment is turned on) and increase in strength as the current increases. Typically, magnetic fields are measured in mG.

Predicted levels of electric and magnetic fields during operation of the Project were modeled based on a horizontally configured, single 500 kV circuit on a structure 145 feet in height, with a minimum clearance of 36.25 feet above ground at the location of maximum sag between structures (HDR 2017g). This represents the minimum ground clearance for the Project considering areas where the conductor sag is at its lowest point, thus providing for the maximum field strengths. The Bonneville Power Administration CAFE program was used to model both EMF characteristics of the Project at both average and forecasted peak line loading. The CAFE model is an industry-standard approach for estimating expected EMF based on existing infrastructure and design parameters. The magnetic and electric field strengths were calculated at a height of 1 meter (3.280 feet) above ground (HDR 2017g).

Rather than model EMF at all of the identified receptors, EMF was modeled at 10 representative locations in the Project Area (HDR 2017g). Each location is representative of specific segments of the Project and with varying design configurations to represent the range of potential configurations for the Project (Table 4.14-3). As such, results of the modeling for these 10 locations can be applied, and considered representative, of the other segments of the Project.

Table 4.14-3 Location of Modeled EMF and Associated Segments of the Project

LOCATION NO.	STATE	SEGMENT
1	AZ	Segment p-01: North of Delaney Substation
2	AZ	Segment d-01: Alternative 1 west of Delaney Substation
3	AZ	Segment i-03: I-10 Utility Corridor
4	AZ	Segment p-06: Kofa National Wildlife Refuge
5	AZ	Segment qn-02: North of I-10 and northeast of Quartzsite
6	AZ	Segment x-07: South of I-10 and south of Quartzsite
7	AZ	Segment cb-04: Copper Bottom Pass
8	CA	Segment p-15w: farmland east of Blythe
9	CA	Segment x-16: East of Colorado River Substation
10	CA	Segment p-17: East of Colorado River Substation

The model results for electric fields for both the existing DPV1 and the Project transmission line for each of the 10 modeling locations is shown in Table 4.14-4. These results have been compared to the ICNIRP occupational and general public exposure reference limits since they are the most conservative compared to the IEEE and ACGIH. The model results show that the electric field strengths for both existing and proposed configurations at the edge of the ROW are below the ICNIRP guidelines for occupational and general public exposure. Electric field strength decreases rapidly with distance away from the line, typically at a rate of one divided by the distance squared. As such, the farther receptors are from the ROW, the lower the electric field will be (i.e., lower still than applicable guidelines). For example, at the locations where, the maximum modeled electric field at the edge of the ROW is 2.0 or 2.1 kV/m (Location 1, 3-10); 100 feet farther left, the modeled level is less than 0.25 kV/m.

Table 4.14-4 Modeled Electric Field Levels at Edge of ROW for Existing and Proposed Configurations

LOCATION NO.	STATE	APPROXIMATE LOCATION (SEGMENT)	LEFT SIDE[1] OF ROW ELECTRIC FIELD (KV/M)			RIGHT SIDE[2] OF ROW ELECTRIC FIELD (KV/M)			ICNIRP GUIDELINES EXPOSURE (MORE/LESS)	
			EXISTING	PROPOSED	CHANGE[3]	EXISTING	PROPOSED	CHANGE[C]	OCCUPATIONAL 8.33 KV/M	GENERAL PUBLIC 4.16 KV/M
1	AZ	**p-01**: North of Delaney Substation	0.2	2.1	1.9	1.8	1.8	0.0	Less	Less
2	AZ	**d-01**: Alternative 1 west of Delaney Substation	0.8	0.9	0.1	0.3	2.1	1.8	Less	Less
3	AZ	**i-03**: I-10 Utility Corridor	0.0	2.1	2.1	0.0	2.1	2.1	Less	Less
4	AZ	**p-06**: Kofa National Wildlife Refuge	1.6	2.1	0.5	1.6	1.6	0.0	Less	Less
5	AZ	**qn-02**: North of I-10 and northeast of Quartzsite	0.4	2.1	1.7	0.5	0.6	0.1	Less	Less
6	AZ	**x-07**: South of I-10 and south of Quartzsite	0.8	2.1	1.3	0.8	1.0	0.2	Less	Less
7	AZ	**cb-04**: Copper Bottom Pass	0.5	2.2	1.7	0.2	0.2	0.0	Less	Less
8	CA	**p-15w**: farmland east of Blythe	1.9	2.0	0.1	1.9	1.9	0.0	Less	Less
9	CA	**x-16**: East of Colorado River Substation	0.8	2.1	1.3	0.8	0.8	0.0	Less	Less
10	CA	**p-17**: East of Colorado River Substation	1.6	2.1	0.5	0.8	0.8	0.0	Less	Less

[1] = Left side is the south side at all locations, but location 1 is on the west side.
[2] = Right side is the north side at all locations, but location 1 is on the east side
[3] = Positive value is an increase; negative value is a decrease.

The model results for average magnetic fields for both the existing DPV1 and the Project transmission line for each of the 10 modeling locations is provided in Table 4.14-5. These results have been compared to the ICNIRP occupational and general public exposure reference limits since they are the most conservative compared to the IEEE and ACGIH. Like electric fields, magnetic field strength decreases rapidly with distance away from the line, typically at a rate of one divided by the distance squared. As such, the farther receptors are from the ROW, the lower the magnetic field will be (i.e., lower still than applicable guidelines). For example, at Location 1, the maximum modeled magnetic field was modeled to be 67.6 mG; 100 feet farther left, the modeled level is approximately 15 mG. In 2014, McCallum et al. (2014) published a peer-reviewed scientific paper about levels of EMF from, among other sources, a 500kV transmission line. Directly under the line, the maximum reported magnetic field level was 46 mG decreasing to 13 mG by 66 feet and reaching background (0.3 mG) by 377 feet.

Table 4.14-5 Modeled Average Magnetic Field Levels at Edge of ROW for Existing and Proposed Configurations

LOCATION NO.	STATE	APPROXIMATE LOCATION (SEGMENT)	LEFT SIDE[1] OF ROW MAGNETIC FIELD (MG)			RIGHT SIDE[2] OF ROW MAGNETIC FIELD (MG)			ICNIRP GUIDELINES EXPOSURE (MORE/LESS)	
			EXISTING	PROPOSED	CHANGE[3]	EXISTING	PROPOSED	CHANGE[C]	OCCUPATIONAL 10,000 MG	GENERAL PUBLIC 2,000 MG
1	AZ	**p-01**: North of Delaney Substation	16.8	67.6	50.8	28.0	14.6	-13.4	Less	Less
2	AZ	**d-01**: Alternative 1 west of Delaney Substation	19.5	21.8	2.3	9.9	64.8	54.9	Less	Less
3	AZ	**i-03**: I-10 Utility Corridor	0.0	63.2	63.2	0.0	63.2	63.2	Less	Less
4	AZ	**p-06**: Kofa National Wildlife Refuge	43.0	67.6	24.6	43.0	60.8	17.8	Less	Less
5	AZ	**qn-02**: North of I-10 and northeast of Quartzsite	28.2	63.4	35.2	22.4	18.2	-4.2	Less	Less
6	AZ	**x-07**: South of I-10 and south of Quartzsite	43.0	63.3	20.3	43.0	19.8	-23.2	Less	Less
7	AZ	**cb-04**: Copper Bottom Pass	49.8	65.1	15.3	23.3	34.5	11.2	Less	Less
8	CA	**p-15w**: farmland east of Blythe	50.2	61.5	11.3	50.2	64.7	14.5	Less	Less
9	CA	**x-16**: East of Colorado River Substation	48.5	62.7	14.2	53.7	50.0	-3.7	Less	Less
10	CA	**p-17**: East of Colorado River Substation	41.4	67.1	25.7	46.6	38.2	-8.4	Less	Less

[1] = Left side is the south side at all locations, but location 1 is on the west side.

[2] = Right side is the north side at all locations, but location 1 is on the east side.

[3] = Positive value is an increase, negative value is a decrease.

To put these levels of EMF into context they are here compared to typical magnetic fields associated with common household appliances. As reported by the NIEHS, the magnetic field can be 40 mG beside (i.e., six inches away) a refrigerator, 50 mG for a ceiling fan, 100 mG for a dishwasher, 300 mG for a microwave, 600 mG for an electric shaver, and 700 mG for a hairdryer (NIEHS 2002b).

Based on this information, direct and indirect impacts to public health and safety due to EMF are expected to be negligible (i.e., no measurable change in current conditions) to minor in magnitude (i.e., a small, but measurable change in current conditions).

Interference with Military Programs, Radio, and Television

Radio and television interference from a transmission line are based on the electrical and physical characteristics of the transmission line. Therefore, potential interference is considered in the design of higher voltage lines (345 kV and above). Radio noise from the Project would not occur until the transmission lines are actually energized. During the construction phase there would be no radio noise from the lines since the conductors do not have voltage on them. Once the lines are energized, the radio noise would vary depending on the weather conditions, with inclement weather producing higher levels of radio noise than fair weather. Regardless of weather conditions, the level of interference would decrease with distance from the transmission line.

The Project could interfere with military programs such as unmanned aerial systems and electronic countermeasures by affecting the quality of military radio frequencies. When radio interference around a transmission line does occur, it is most likely due to gap discharges, which occur when separations (gaps) develop between mechanically connected metal parts (e.g., due to broken, improperly installed, or loose hardware). Line hardware is designed to be problem free, but wind motion, corrosion, and other factors can create a gap discharge condition. These conditions can lead to utility equipment or material failures. Therefore, when identified, DCRT would locate and remedy them promptly (BMP-PHS-1).

The frequency of the Project would be 60 Hz; in comparison, the frequency of a cell phone is 1.0^9 Hz. Therefore, the operating frequency of the Project would be unlikely to affect military radio frequencies. The Project would also operate under Federal Communications Commission (FCC) regulations (47 CFR 15), which require that, "best engineering principles shall be used in the generation of radio frequency currents by power line carrier systems to guard against harmful interference to authorized radio users, particularly on the fundamental and harmonic frequencies," where harmful interference is defined as any "emission, radiation or induction that endangers the functioning of a radio navigation service or of other safety services or seriously degrades, obstructs or repeatedly interrupts a radiocommunications service operating in accordance with this chapter." In the event that interference occurs, the regulations require that, "the electric power utility shall discontinue use or adjust its power line carrier operation, as required, to remedy the interference." Therefore, the Project would minimize radio interference to a negligible level. If it does occur, effects would be very localized, and would be remedied by DCRT. After energizing the transmission line, DCRT shall respond to and document all radio/television/equipment interference complaints received and the responsive action taken. These records shall be made available to the responsible agencies for review upon request.

It is expected that impacts resulting from the decommissioning process would be like the impacts during construction of the Project.

4.14.5.4 Intentional Destructive Acts

Intentional destructive acts include acts of theft, vandalism, sabotage, and terrorism. Acts of sabotage or terrorism are rare. In the past, the relatively few sabotage acts have typically been carried out against electrical equipment and structures in remote areas, typically by domestic radical environmental groups. In today's geopolitical climate, attacks on the nation's electrical infrastructure by international terrorist groups or their allies are entirely possible. Protection of widely dispersed electrical generation equipment, substations, and thousands of miles of transmission lines from destructive acts is not practical. Damaged equipment and transmission lines may be quickly repaired or replaced in the same manner that storm-damaged equipment is returned to service.

Acts of theft and opportunistic vandalism are more likely to occur. Protections against theft and opportunistic vandalism include basic security measures such as security lighting, fencing, and surveillance. The presence of workers, security guards, or local residents also discourages theft, but substations and other equipment are increasingly remotely controlled and are unmanned. The presence of high-voltage electricity also presents a certain deterrent to theft. Prosecution of thieves and monitoring of metal recycling operations may also deter theft of metals and equipment. Similarly, prosecution of vandals damaging transmission system equipment may discourage vandalism if it should become a problem. Potential impacts to transmission or substation facilities from outages resulting from intentional destruction would be negligible to minor and short term.

The risk of damage to the Project from intentional destructive acts would be considered very low, in line with or less than the risk to similar transmission facilities in the U.S. Theft or opportunistic vandalism is more likely to occur than sabotage or terrorist acts, which are considered a negligible risk. The results of any such acts could be expensive to repair, but no substantial impacts to continued electrical service would be anticipated. An Emergency Response Plan, Fire Plan, and Health and Safety Plan would be completed for the Project (APM-HAZ-01, APM/BMP-HAZ-02). Impacts expected from physical damage to the Project or from loss of power delivery would be negligible to minor and short term.

4.14.6 Mitigation Measures

There are no MMs identified for public health and safety for any of the specific segments and thus, no MMs have been identified for any of the full route alternatives or subalternatives described below. However, recreation mitigation (Section 4.14.4.4) would reduce the magnitude of public health and safety impacts of the Project. Further, the BLM developed required BMPs would reduce impacts to public health and safety (Appendix 2A).

4.14.7 Construction of Full Route Alternative and Subalternative Effects

4.14.7.1 All Action Alternatives

Based upon the impact analysis described above, direct and indirect impacts to public health and safety from construction, operation, maintenance, and decommissioning for all full route alternatives, including any applicable subalternatives, are expected to be negligible (i.e., no measurable change in current conditions) to minor in magnitude (i.e., a small, but measurable change in current conditions), even when the number of sensitive receptors changes among various segments.

4.14.8 Residual Impacts

No MMs are required for public health and safety based upon the incorporation and implementation of the full route alternatives or subalternatives. As such, there are no expected residual impacts from the Project.

4.14.9 CDCA Plan Compliance

CMAs DFA-VPL-BIO-FIRE-1 and DFA-VPL-BIO-DUNE-1 would apply to the Project (Appendix 2C). The Project would comply with these CMAs through APM-HAZ-02 and BMP-PHS-02 (Appendix 2A, Section 2A.9).

4.14.10 Unavoidable Adverse Effects

For the reasons provided above, direct and indirect impacts from the Project are expected to be negligible (i.e., no measurable change in current conditions) to minor in magnitude (i.e., a small, but measurable change in current conditions). There are no unavoidable adverse effects associated with this resource.

4.14.11 Cumulative Effects

The CEA for potential cumulative impacts to public health and safety represents a reasonable region in which public health and safety, when assessed in combination with other cumulative actions, would be impacted if the Project were implemented. Existing and reasonably foreseeable actions have the potential to result in cumulative impacts by increasing variables related to public health and safety, namely fire and EMF. These projects include the existing DPV1, existing pipelines, existing and planned utility scale solar projects, the approved 230kV generation interconnection line associated with the Blythe Mesa solar project (Alternative Segment ca-09 would parallel and be adjacent to the ROW for this line), substation construction and expansions, and the future expansion of the communities and roadways within the analysis area. Based upon EMPs and BMPs that are required to be implemented for many of the past, present, and reasonably foreseeable projects in the CEA for public health and safety, cumulative effects could be minor to moderate.

4.14.11.1 Fire

Past, present, and reasonably foreseeable future projects and disturbances (Section 3.20) increase the cumulative level of human influence adjacent to wildlands and potentially increase the number of human-caused wildfire ignitions. The Project's contribution to increased probability of human-caused wildfire ignitions would be minor based on the short duration of construction activity. The presence of the overhead transmission line would create an ongoing source of potential wildfire ignitions for the life of the Project. Ignitions can be caused by such unpredictable events as lightning strikes, conductor contact by flying debris, mechanical malfunction or failure of transmission line components, and miscellaneous collisions (i.e., birds, helicopters, planes). These events are rare but would be unavoidable. When considered in combination with other reasonably foreseeable projects in the CEA, the potential for wildfire ignitions would be a minor cumulative impact.

4.14.11.2 EMF

Reasonably foreseeable future sources of EMFs include the Harquahala Solar Project, the Quartzsite Solar Energy Project, Blythe Energy Power Plant/Sonoran Energy Project, the Blythe Mesa Solar Project, Desert Quartzite Solar Project, the Crimson Solar Project, and other sources likely to increase as development continues within the CEA.

Once operational, the EMFs associated with the Project would not combine with the impacts of other projects because the impact would only occur in the immediate area of this Project. The addition of other new energy facilities would not change the level of effect at any specific location. Similarly, negligible impacts associated with EMF exposure from transmission lines would only occur in the immediate vicinity of the lines. The Project is not anticipated to contribute any more than negligible to minor cumulative public health impacts associated with EMF due to its distance away from potential receptors.

Because the Project would comply with all relevant regulatory requirements regarding use and disposal of hazardous materials, the incremental effects of the Project related to exposing workers, the public, or the environment to hazardous materials would be minimal. In summary, cumulative impacts from reasonably foreseeable projects would be expected if construction and operation of the projects resulted in an increase in the risk of wildfires or an increase in ambient noise or EMFs. However, fire protection measures and Project design features would mitigate and/or minimize potential risks. Therefore, the cumulative fire hazards and cumulative effects from potential EMFs associated with past, present, and reasonably foreseeable projects would be minor.

4.14.11.3 Intentional Acts of Destruction

Other past, present, and reasonably foreseeable projects, such as DPV1, the Harquahala Power Plant, Venable Solar 1 and 2, Blythe Energy Center, numerous transmission and distribution lines, Harquahala Solar Project, Quartzsite Solar Energy Project, Blythe Energy Power Plant/Sonoran Energy Project, Blythe Mesa Solar Project, Desert Quartzite Solar Project, and Crimson Solar Project located in the region, are subject to similar regulatory requirements and industry standards related to public health and safety. As such, the potential for intentional acts of destruction is minimized. Implementation of emergency response plans and fire management plans in the event of an emergency would also be standard protocols for facilities in the region and similarly effective in ensuring no cumulative effects related to emergency response or power delivery.

4.14.11.4 Zone-Specific Cumulative Effects

East Plains and Kofa Zone

Cumulative impacts to public health and safety in the East Plains and Kofa Zone, including fire and EMF, are expected to be minor as all reasonably foreseeable future projects must adhere to Federal, state, and local regulations.

Quartzsite Zone

Cumulative impacts to public health and safety in the Quartzite Zone, including fire and EMF, are expected to be minor as all reasonably foreseeable future projects must adhere to Federal, state, and local regulations. The community of Quartzsite with a large influx of seasonal visitors, creates additional risks for fires, such as a greater number of human-caused fire incidents and a greater number of sensitive receptors.

Copper Bottom Zone

Cumulative impacts to public health and safety in the Copper Bottom Zone, including fire and EMF, are expected to be minor as all reasonably foreseeable future projects must adhere to Federal, state, and local regulations.

Colorado River and California Zone

Cumulative impacts to public health and safety in the Colorado River and California Zone, including fire and EMF, are expected to be minor as all reasonably foreseeable future projects must adhere to Federal, state, and local regulations. The larger population in Blythe and the surrounding areas, such as along the Colorado River and in the community of Mesa Verde, creates additional risks for fires, such as a greater number of human-caused fire incidents and a greater number of sensitive receptors, than in other less-populated areas.

4.14.12 Irreversible and Irretrievable Commitment of Resources

Impacts would not be considered irreversible or irretrievable commitments of resources because the impacts to public health and safety would no longer exist after decommissioning the transmission line.

4.14.13 Relationship of Short-term Uses and Long-term Productivity

There would be no short-term uses versus long-term productivity conflicts to public health and safety as a result of the implementation of the Project.

4.15 SOCIOECONOMICS

4.15.1 Introduction

Impacts to socioeconomics are discussed in terms of effects on the economy, population, housing, tax revenues, public services, property values, and the tourism and recreation related economy. The impacts described are based on regional economic modeling incorporating projected construction and operation and maintenance activities, accepted socioeconomic analytical practices, and the other resource assessments provided in this Technical Environmental Study.

4.15.2 Methods for Analysis

4.15.2.1 Analysis Area

As noted in Section 3.15, some economic data are reliably available only at the county level while others are available at the census block group geographic level. Due to the dominance of Phoenix and Los Angeles at the county level for Maricopa County and Riverside County, respectively, in socioeconomic data areas, the Block Group study area will be the analysis area where possible. Otherwise the three-county analysis area will be used. The Block Group study area is comprised of the block groups that contain the area within 0.5-mile of the Proposed and Alternative segments. The block group study area is the area that would be most affected by the Project. The block groups do not coincide with the geographic zones used for analysis of most of the other resources in this Technical Environmental Study. Consequently, the zones will not be used in this section.

Economic effects from the Project were estimated using the RIMS II regional economic model, developed by the US Department of Commerce Bureau of Economic Analysis. RIMS II is an input/output modeling system that is widely used by both private-sector and public-sector economists throughout the US to assess the potential economic impacts of proposed projects within a broad range of sizes and industries. The model is based on "interindustry relationships within regions" (BEA 1997) and uses multipliers determined through recent economic activity to estimate indirect and induced effects of any given project on the modeled area. One example of a potential indirect effect would include any "multiplier" effects on the economy resulting from the recirculation of money spent by construction workers or the purchase of construction goods and services within the analysis area. RIMS II multipliers used for this analysis are based on 2007 national benchmark input-output data and 2015 regional data.

4.15.2.2 Assumptions

The construction phase of the Project would have a greater impact on jobs, income, population, housing, and the economy, than the operations and maintenance phase. The decommissioning phase would be similar to the construction phase relative to anticipated socioeconomic impacts. Such impacts, however, would occur so much later in time that conducting a thorough analysis for decommissioning now would necessarily rely on unsupported assumptions. Construction of the Project would produce multiple types of revenue streams that would stimulate the local economy—procurement of locally sourced goods and services, wages paid to local construction workers, and the local expenditures of non-local construction workers during the period they reside in the analysis area. Each of these revenue streams was incorporated in the RIMS II analysis. Operation and maintenance of the transmission line would generate tax revenues for as long as the line is in use, as well as potential right-of-way lease fees.

Even though the majority of the construction workforce would be temporary workers who would not permanently reside in the analysis area, they would still contribute to the overall economic impacts of the Project. Given that the non-local labor force would reside in the local community for the duration of the Project, they would inevitably spend a portion of their income in the local econo0my. These local expenditures would likely primarily include housing, food, and entertainment. DCRT estimates that approximately 45 percent of Project construction workers would be hired from the local labor pool, which is typically defined as workers who reside within a 50-mile radius of the Project (DCRT 2017b).

Given the short-term and migratory nature of this Project during construction activities, very few of these employees are expected to be accompanied by their families. Experience on similar projects has shown that the proportion of non-local construction workers accompanied by their families ranges from none to roughly 10 percent of the non-local work force (BLM 2013a; 2013d). To ensure this analysis does not inadvertently understate potential population-related impacts, the analysis assumes that 10 percent of the non-local construction workforce would be accompanied by a spouse and a school-aged child.

The local economic opportunities that result from construction-related payroll and construction expenditures for local goods and services could also lead to additional migration to the analysis area. The RIMS II model provides estimates of the number of indirect and induced jobs that would be created due to these expenditures. “Indirect effects,” as the term is used in economics, includes additional employment and wages resulting from spending by the construction companies, while “induced effects” are increased employment and wages resulting from the economic growth associated with increased spending by workers in the area. The extent to which indirect and induced jobs would be filled by existing residents in the analysis area, versus people drawn to the area by these new employment opportunities, is unknown. For purposes of estimating potential impacts on population, this analysis provides a range of potential population effects from the alternatives. At the low end, the indirect and induced jobs are assumed to be filled entirely by local residents and estimates of population effects include only the direct Project construction workers and families from outside the Project Area (55 percent). At the high end, half the indirect and induced jobs are assumed to be filled by workers who migrate to the analysis area. The composition of these workers’ households is assumed to mirror the current average of 2.19 persons per household within La Paz County, which is considered most representative of the Project Area (US Census Bureau 2017).

Non-local workers, direct or indirect, would require housing in the analysis area. For purposes of considering potential effects on housing conditions, the number of projected non-local workers is compared to the estimated availability of rental housing, motel/hotel rooms, and RV sites within the analysis area.

During the operations and maintenance phase of the Project, which is expected to last approximately 50 years, DCRT estimates a workforce of three, full-time equivalent local jobs at a cost of $195,000 per year (in 2020 dollars) (DCRT 2017).

4.15.2.3 Environmental Effect Indicators, Magnitude, and Duration

Potential impacts to socioeconomic conditions may be either positive or negative. The following types of potential impacts were included in the socioeconomic impact analysis to determine presence, duration, and intensity:

- Change in employment opportunities, directly or indirectly, resulting from the Project, compared to current and historic trends;
- Change in taxes resulting from the Project, compared to current and historic trends;
- Change in population, increased infrastructure, or other change that induces growth resulting from the Project;
- Physical division of an established community resulting from the Project;
- Displacement of a substantial numbers of people or existing housing on a permanent basis, necessitating the construction of replacement housing outside the local region;
- Project-related induced long-term population growth to an extent that could not be accommodated by existing local housing, local services, and infrastructure;
- Project-related substantial long-term reduction in revenue for local businesses, government agencies, or Indian tribes;
- Project impacts that would substantially alter the lifestyles or quality of life, including non-market values, of populations using, or residing in proximity to, the Project;
- Project impacts that would substantially alter production or delivery of current levels of ecosystem services to local and regional populations;
- Conflicts with applicable land use plans and policies associated with socioeconomics, public services, or utilities created by the Project;
- Percent change in property values; and,
- Change in revenue generated by recreation.

4.15.3 No Action Alternative

Under the No Action Alternative, no ROW would be granted for the Project and the transmission line, SCS, and ancillary facilities would not be constructed. Current conditions in the analysis area described in Section 3.15 would continue under the No Action Alternative.

4.15.4 Construction of Action Alternative Segments

4.15.4.1 Direct and Indirect Effects Common to All Action Alternatives

The Project would involve a relatively short-term construction phase followed by long-term (50 years) operation and maintenance of a new transmission line and appurtenant facilities, including the SCS and substation equipment. During the construction phase crews responsible for specific construction tasks would likely not remain in any one area for the full duration of the construction period, which is estimated by DCRT to be approximately 24 months. Thus, impacts at any one location along the construction route would be for a shorter time period than the full construction phase.

DCRT's general contractor would hire a number of local workers and non-local workers to complete the Project. They would also spend money on materials and services for construction, with the majority of those expenditures going to suppliers outside the analysis area.

DCRT has developed and provided estimates of the required workforce—and anticipated expenditures for labor, supplies, and materials for the Project. These estimates are assumed to be adequate to determine construction impacts for any of the full route alternatives and any associated subalternatives.

Overall, the Project could contribute to future economic development and long-term job growth in the region by improving reliability of the electrical grid and increasing the ability of the grid to meet the demand of future growth such as facilitating solar and other new electrical generating facilities. By increasing the efficiency and capacity of the electrical grid the Project would increase the profitability of electrical utilities by lowering costs and further the states' efforts to increase the percentage of electricity generated from renewable sources.

Economic Effects

As shown in Tables 2.2-6 through 2.2-8 in Section 2.2.7.5, the construction crew for the transmission line would consist of approximately 120 workers and take a year and a half to two years to complete. Substation work would require a crew of about 40 workers over a year. DCRT projects that 45 percent of the workforce (approximately 63 workers) would be hired from the local workforce with the remainder coming from outside the area (DCRT 2017).

DCRT estimates that the Project, overall, would cost approximately $279.6 million. Out of that amount, $37.8 million would be for the interconnection, leaving $241.8 million for labor, materials, equipment rental and operation, engineering, and other expenses. All of these figures are in 2020 dollars.

The RIMS II model provides impact multipliers by county or regions comprised of counties. In this case the RIMS II multipliers are specific to the three-county region and not by segments or alternative routes. The disadvantage of using this area, due to the economic influence of Los Angeles and Phoenix, is described in Section 4.15.2. Nevertheless, the model provides insight on the beneficial economic impacts of the Project on the local region.

As shown in Table 4.15-1, construction of the Project is projected to support approximately 160 short-term construction jobs for up to two years (Table 2.2-9 and Table 2.2-10). This total includes the projected 63 local hires associated with construction, as well as another 63 indirect jobs that would be supported by local purchases of supplies and materials for construction, based on the RIMS II multipliers for the three-county region. An additional 100 new positions would be supported by (induced) household expenditures by the construction workforce (local and non-local) during the construction period.

Table 4.15-1 Impacts to Jobs and Employment

JOBS	DIRECT	INDIRECT	INDUCED	TOTAL
Transmission Line	120	54.1	85.5	259.6
Substation	40	9.0	14.3	43.3
Total	160	63.1	99.8	302.9

Table 4.15-2 shows the impact, during construction, that the Project would have on local earnings, based on the RIMS II multipliers, in addition to the earnings of the construction workforce (direct earnings). These earnings would occur over the two-year construction period. Including the earnings of the construction workforce would roughly double this amount.

Table 4.15-2 Impacts to Earnings from Indirect and Induced Employment

EARNINGS	DIRECT	INDIRECT	INDUCED	TOTAL
Total ($ millions)	N/A*	13.3	17.7	31.0

*N/A – Not Available, at the request of the Applicant

The third impact that can be calculated using the RIMS II model is the change in "final demand" or overall economic benefit to the local region. Based on the final construction cost of $241.8 million, RIMS II projects an overall economic impact of $489.2 million, including direct, indirect, and induced impacts. This must be considered an optimistic projection since it does not compensate for materials purchased from outside the region. Due to the rural nature of the region (excluding the Phoenix and Los Angeles urban centers) it is likely that only a small percentage of the construction materials (steel, conductors, concrete) can be purchased locally, which would substantially reduce this impact, perhaps by as much as half. By the same token, the rural nature of the Project Area and its associated relatively lower income flows increases the impact to the local economy when considered on a percentage basis.

During the operations and maintenance phase (Section 4.15.5), DCRT expects an annual payroll of $195,000, which would be a minor benefit to the region, but too small an impact to be modeled in RIMS II.

Population and Housing

Approximately 55 percent of the construction workforce is expected to consist of non-local employees who would reside in the analysis area during the construction period (DCRT 2017). Given the short-term and migratory nature of this Project, and based on experience with similar projects, very few of these employees are expected to be accompanied by their families. To ensure this analysis does not understate potential population-related impacts, a range of scenarios regarding population and housing impacts would be used, as described in Section 4.15.2.2. The analysis assumes that 10 percent of the non-local construction workforce would be accompanied by a spouse and a school-aged child, which would give a household size of 3.0 persons, compared to 2.19 persons per household in La Paz County, as determined by the 2010 US Census (US Census 2017). In addition, the first scenario would assume that 100 percent of the indirect and induced jobs attributed to the Project would be from the local labor pool. The second scenario would assume that half of those positions would be filled by workers moving into the area. Table 4.15-3 shows the results of both scenarios, based on Table 4.15-1.

Table 4.15-3 Impacts to Population

POPULATION	DIRECT*	INDIRECT	INDUCED	NON-LOCAL HOUSEHOLD PERSONS**	POPULATION INCREASE (PERSONS) ***
Scenario One – All Indirect and Induced Hires Local					
Local	63	63	100	0	0
Non-Local	77	0	0	15.4	92.4
Scenario Two – Half of Indirect and Induced Hires Non-Local					
Local	63	31.5	50	0	0
Non-Local	77	31.5	50	31.7	190.2

* Construction Workers

** Non-Local Households = 10% of non-local workers times 2

*** Population Increase = non-local workers and their families

For purposes of estimating potential impacts on population, this analysis provides a range of indirect and induced jobs and associated population and housing impacts from the Project. At the low end, Scenario One, the indirect and induced jobs are assumed to be filled entirely by local residents and estimates of population effects include only the direct Project construction workers and their accompanying families. At the high end, depicted above as Scenario 2, half the indirect and induced jobs are assumed to be filled by workers who migrate to the analysis area. Under Scenario One, approximately 92 construction workers and family members would move into the area for the duration of the Project, including about eight children. Under Scenario Two, approximately 190 construction workers and family members would move into the area for the duration of the Project, including about 16 children.

Table 4.15-4 shows that these projected population effects would represent an increase of between 0.45 percent and 0.93 percent of the 2014 population of La Paz County (Table 3.15-1), and between 0.001 percent and 0.003 percent of the three-county socioeconomics study area. In practice; however, the construction workforce would be expected to move across the Project Area as construction proceeds. Note that the percentage change in the population between 2010 and 2014 was 2.7 percent for Arizona, 2.2 percent for California, -0.7 percent for La Paz County, 3.4 percent for Maricopa County (and for the three-county area), and 3.5 percent for Riverside County (Table 3.15-1). Consequently, the Project's impact on population would be considered negligible and short-term.

Table 4.15-4 Population Impacts as a Percent

AREA	2014 POPULATION (TABLE 3.15-1)	SCENARIO ONE		SCENARIO TWO	
		POPULATION INCREASE (PERSONS)	POPULATION INCREASE (%)	POPULATION INCREASE (PERSONS)	POPULATION INCREASE (%)
La Paz County	20,348	92	0.452 %	190	0.934%
Maricopa County	3,947,382	92	0.002%	190	0.005%
Riverside County	2,266,899	92	0.004%	190	0.008%
Three-County Study Area	6,234,629	92	0.001%	190	0.003%
Block Group Study Area	21,710	92	0.424%	190	0.875%

Non-local workers, direct, indirect, or induced, would require housing in the analysis area. For purposes of considering potential effects on housing conditions, the number of projected non-local workers is compared to the estimated availability of rental housing, motel/hotel rooms, and RV sites within the analysis area. Table 4.15-5 compares 2014 existing housing units (Table 3.15-3) with increased demand for housing from the Project. Note that for Scenario One, only 77 housing units would be required since the 15.4 persons shown in column five of Table 4.15-3 would be sharing living space with the workers in column two; for Scenario Two, 158 housing units would be needed for the same reasons.

Table 4.15-5 Project Impacts on Existing Housing Units

AREA	2014 HOUSING UNITS (TABLE 3.15-1)	SCENARIO ONE		SCENARIO TWO	
		HOUSING UNITS INCREASE	HOUSING UNITS INCREASE (%)	HOUSING UNITS INCREASE	HOUSING UNITS INCREASE (%)
La Paz County	16,113	77	0.478%	158	0.981%
Maricopa County	1,657,753	77	0.005%	158	0.010%
Riverside County	810,426	77	0.010%	158	0.019%
Three-County Study Area	2,484,292	77	0.003%	158	0.006%
Block Group Study Area	13,750	77	0.560%	158	1.149%

The housing units shown in Table 4.15-5 includes both owner-occupied and rental units. Vacancy rates in 2014 for the three counties are shown in Table 4.15-6. These numbers suggest that the Project's impact on available housing would negligible. It should also be noted that many campsites are available in the Project Area as well (Section 3.10).

Table 4.15-6 2014 Vacancy Rates (Percent) By Type of Occupancy

AREA	OWNER OCCUPIED	RENTAL
La Paz County, AZ	3.8%	12.4%
Maricopa County, AZ	3.1%	9.4%
Riverside County, CA	2.5%	7.1%
Quartzsite, AZ	6.4%	23.2%
Blythe, CA	2.7%	7.7%

Tax Revenue Effects

Construction-related economic activity would also generate additional tax revenues for state and local governments in the Project Area. Sources of new tax revenues would be sales and use taxes, and property taxes. Tax rates vary depending on whether the land is leased or owned, public or private, so it would be difficult to estimate what the tax proceeds would be from the Project before a final route is selected. In any case, income from taxes generated by the Project could be considered a positive impact for local units of government.

Effects on Public Services

In addition to the temporary increase in demand for housing described above, the non-local construction workforce and any non-local workers and families who migrate to the area to fill indirect employment opportunities, would also create additional short-term demands for public services such as police and fire protection, education, and medical services. Much like the housing situation, these added demands are unlikely to create substantial challenges in the Project Area due to the comparatively small numbers of non-local workers. The effects on public services during the construction period should be negligible to minor and short term.

Effects on Property Values

As described in Sections 3.8 and 4.8, the primary impacts to residential and other developed properties during construction are from noise, dust, heavy equipment, and perhaps access. An inventory of land use within the analysis area for the Proposed and Alternative segments was completed. Residential or Rural Residential land accounted for 8 percent of the total area within the land use study area. The majority of that is classified as Rural Residential (just under 12,000 acres out of 12,799 acres), indicating that the land use study area is primarily rural in nature with few residences present. Section 3.8 details the location of these lands. Construction phase impacts would be short-term as construction in any specific area would be accomplished fairly quickly. Therefore, it is unlikely that the construction phase would have a lasting impact on property values.

Effects on Recreation and Tourism Economy

Based on the recreation impact analysis provided in Section 4.10, impacts to recreation and recreation areas would be localized and short-term and primarily related to noise, dust, visual disturbance and restricted access during construction. Considering the large number of recreational opportunities and their areal extent, the reduction in recreation users coming to the area should be minor, as most users would likely move to other nearby locations not impacted by construction activities.

Recreation activities, such as OHV riding, hunting, wildlife viewing, hiking, and equestrian activities, might be temporarily affected in some locations or displaced to other locations for short periods of time. These short-term, localized impacts are unlikely to result in a discernible impact to the tourism- and recreation-related economy.

4.15.5 Operations, Maintenance, and Decommissioning

In contrast to the large workforce and expenditures required for construction, ongoing operations and maintenance would require few workers (DCRT 2019) and have relatively little direct economic impact in the Project Area. Decommissioning the Project would require more workers than during operations and maintenance but it is unlikely the workforce and expenditures would be as large as that associated with construction. After decommissioning, there would be no further economic or social effects associated with the Project.

4.15.5.1 Economic Effects

As noted above the operations and maintenance phase would require a minimal workforce, estimated at the equivalent of three full-time workers with an annual payroll of $195,000 in 2020 dollars (DCRT 2017). There would be comparatively few other expenditures for materials or supplies. In contrast to the No Action Alternative; however, each of the Action Alternatives would meet the purpose and need for the Project in improving reliability of the electrical grid in California and Arizona, increasing the ability of the grid to meet demand growth in the region, or facilitating potential renewable generation development in the region. The long-term economic impacts from these aspects cannot be modeled in RIMS II, but would be positive and could be major.

4.15.5.2 Tax Revenue Effects

As noted in Section 4.15.4.1 on Tax Revenue Effects during construction, the transmission line and appurtenant facilities could produce more substantial property tax revenues for local governments once fully constructed. It would be difficult to accurately estimate property taxes before a final route is selected. Property tax revenues would decrease over time during the period of operations due to depreciation in the value of the facilities.

4.15.5.3 Population Effects

Ongoing operations and maintenance would require relatively few workers. The Project would have negligible to minor long-term effects on the population of the Project Area.

4.15.5.4 Housing Effects

The Project would have negligible to minor, long-term effects on housing within the Project Area.

4.15.5.5 Effects on Public Services

The Project would have negligible to minor long-term effects on most public services within the Project Area during the operations and maintenance phase. However, to the extent the Project improves reliability of the electrical grid in southern California and Arizona and increases the ability of the grid to meet demand growth in the region, it could provide long-term improvements for the area in terms of electric utility service. Taxes collected on the transmission line and associated facilities have the potential to improve public services.

4.15.5.6 Effects on Property Values

The concern that transmission lines may cause long-term decreases in property values has led to extensive research on the subject. Studies have used both quantitative analyses of market data and survey methods to investigate how land values are impacted. However, despite the large volume of available literature, the conclusions are not clear or consistent. Instead the research indicates that the effects of transmission lines on property values appear to differ depending on the situation.

Studies since 1990 have indicated there may be property value effects from transmission lines, though in most studies the decreases in land values are relatively small and seldom exceed 15 percent. The impacts also generally decrease dramatically with distance from the transmission line (Colwell 1990; Delaney and Timmons 1992; Hamilton and Schwann 1995). The properties most likely to be affected are those that are directly adjacent to the transmission lines. One empirical study found that while the adjacent properties experienced a 6.3 percent decrease in value, the properties that were in close proximity, but were not directly adjacent experienced only a one percent decrease in value (Hamilton and Schwann 1995). A study conducted in the Montreal area found that properties located one or two lots away from transmission lines actually increased in value due to the benefit of the open space created by the transmission line ROW (Des Rosiers 2002). Negative impacts have also been found to diminish over time as well as distance (Colwell 1990).

Other studies have found that it is primarily the visibility of the transmission lines that impacts property values. A survey of experienced appraisers found that on average, transmission lines decreased property values by 10.2 percent. Impacts attributed to the visibility of the infrastructure, particularly of the permanent structures, did not noticeably dissipate over time (Delaney and Timmons 1992). Other studies have found that the major cause of diminished property values was the encumbrance of the transmission line easement placed on the land (Chalmers and Voorvaasrt 2009; Colwell 1990).

The majority of the existing literature has focused on urban residential properties in densely populated northern regions. This, in conjunction with the inconsistent results, makes it difficult to directly apply the findings to the largely rural Project Area. However, there is evidence that property values in less densely populated areas are less sensitive to transmission lines (Chalmers 2012; Delaney and Timmons 1992). For agricultural lands in Montana, there was no evidence of market impacts from transmission lines. When interviewed, property owners did express that the lines were a nuisance, but the lines did not impact their decision to purchase the property or how much they paid for it (MSTI 2012). However, rural lands with recreation attributes may experience slightly diminished property values, particularly when the recreation is related to the rural scenery. Rural residential properties may also be impacted by transmission lines. In tight housing markets, there have not been noticeable effects. However, when there are many suitable substitutes for housing, those closer to transmission lines have taken longer to sell and have sold for comparatively less. The size of the rural property, both for residential and non-residential uses, evidently plays a large role in determining the magnitude of the impacts from transmission projects. Larger properties diffuse the impacts of the transmission line and therefore minimize the effects compared to those on smaller properties (Chalmers 2012).

Property owners allowing the use of a portion of their property for the transmission line ROW would be compensated by DCRT for the encumbrance the line creates upon their land and potential reductions in their property values.

As noted above, Residential or Rural Residential land accounted for 8 percent of the total area within the land use study area. Details about land use in the analysis area is in Section 3.8. In general, because of the small amount of residential land in the analysis area, its distance from the Project, and the nature of rural residential properties, loss of property value is anticipated to range from negligible to moderate (depending on the segment). In the following sections, it will be noted where there is residential land use that would be impacted by specific route segments.

4.15.5.7 Effects on Recreation and Tourism Economy

Ongoing operations and maintenance should have little or no long-term effect on the tourism- and recreation-related economy. As noted in the previous section on property values it has been demonstrated that impacts from visual disturbance dissipate quickly with distance from transmission lines; given the vast area available for high-quality recreation the transmission line and its associated facilities should have negligible impact on the recreation and tourism economy.

4.15.6 Mitigation Measures

There are no MMs identified for socioeconomics for any of the specific segments. No MMs have been identified for any of the full route alternatives or subalternatives described below.

4.15.7 Construction of Full Route Alternative and Subalternative Effects

4.15.7.1 Proposed Action

In general, the socioeconomic impacts would include provision of some jobs, some increase in tax income to local units of government, and a short-term increase in local spending for goods and services during the construction phase. Two areas of local concern during scoping were impacts to residential property values and to the recreation and tourism economy. In both cases the Proposed Action probably produces the lowest negative impacts as it crosses fewer residential areas overall, and, being located adjacent to the existing DPV1 line over a large distance, it would likely have a lower visual impact on currently undeveloped areas. Among the five full route alternatives, the Proposed Action would impact the second lowest acreage of residential and rural residential lands within 2,000 feet of the line (the land use study area), based on the data in Section 3.8.3.3, at 1,833 acres over the full length of the line (Table 4.15-7).

Table 4.15-7 Summary of Residential Land and Recreation/Tourism by Alternative

ALTERNATIVE	ACRES OF RESIDENTIAL AND RURAL RESIDENTIAL LANDS WITHIN THE STUDY AREA	RECREATION AND TOURISM ECONOMY POTENTIALLY IMPACTED
Proposed Action	1,833	None
Alternative 1	3,960	Dome Rock Camping Area
Alternative 2	3,315	La Posa LTVA
Alternative 3	3,229	Cunningham Peak, Dome Rock Mountains
Alternative 4	1,371	Johnson Canyon, Dome Rock Mountains

4.15.7.2 Alternative 1: I-10 Route

Socioeconomic impacts for Alternative 1 would be largely the same as for the Proposed Action, with the exceptions of impacts to residential properties, and recreation and tourism within the Land Use study area. Regarding residential properties, Alternative 1 would impact the greatest amount of residential acreage among the five full route alternatives at 3,960 acres (Table 4.15-7). Regarding recreation and tourism, the I-10 route would follow I-10 and avoid impacts to the Copper Bottom Pass area, but would cross through the Dome Rock Camping Area, both of which are heavily used for recreation. However, Alternative 1 likely would not change the contribution of recreation and tourism to local economies in the Project Area.

<u>Subalternatives to Alternative 1 (1A through 1E)</u>

Impacts under the Subalternatives to Alternative 1 would be effectively the same as for Alternative 1 and the Proposed Action.

4.15.7.3 Alternative 2: BLM Utility Corridor Route

Socioeconomic impacts for Alternative 2 would be largely the same as for the Proposed Action, with the exceptions of impacts to residential properties, and recreation and tourism within the Land Use study area. Regarding residential properties, Alternative 2 would impact the second greatest amount of residential acreage among the five full route alternatives at 3,315 acres (Table 4.15-7). Regarding recreation and tourism, Alternative 2 would place the Project parallel to SR 95, east of the highway and within the eastern portion of the La Posa LTVA. The presence of the Project within the LTVA could impact the quality of the recreational experience, either resulting in condensing use in other portions of the LTVA or a reduction in LTVA users. A reduction in LTVA users could, in turn, could change the contribution of recreation and tourism to local economies in the Project Area.

<u>Subalternatives to Alternative 2 (2A through 2E)</u>

Impacts under the Subalternatives to Alternative 2 would be effectively the same as for Alternative 2 and the Proposed Action, with exception of Subalternative 2C, which would place the Project in

Johnson Canyon. If the technical OHV qualities of Johnson Canyon were perceived by recreation users to have been degraded, recreational use of the Canyon would reduce and could change the contribution of recreation and tourism to local economies in the Project Area.

4.15.7.4 Alternative 3: Avoidance Route

Socioeconomic impacts for Alternative 3 would be largely the same as for the Proposed Action, with the exceptions of impacts to residential properties, and recreation and tourism within the Land Use study area. Regarding residential properties, Alternative 3 would impact the third greatest amount of residential acreage among the five full route alternatives at 3,229 acres (Table 4.15-7). Regarding recreation and tourism, Alternative 3 would impact Cunningham Peak and currently undeveloped portions of the Dome Rock Mountains, while avoiding the actual Copper Bottom Pass area. However, Alternative 3 likely would not change the contribution of recreation and tourism to local economies in the Project Area.

Subalternatives to Alternative 3 (3A through 3M)

Impacts under the Subalternatives to Alternative 3 would be effectively the same as for Alternative 3 and the Proposed Action, with exception of Subalternative 3K, which would place the Project in Johnson Canyon. If the technical OHV qualities of Johnson Canyon were perceived by recreation users to have been degraded, recreational use of the Canyon would reduce and could change the contribution of recreation and tourism to local economies in the Project Area.

4.15.7.5 Alternative 4: Public Lands Emphasis Route

Socioeconomic impacts for Alternative 4 would be largely the same as for the Proposed Action, with the exceptions of impacts to residential properties, and recreation and tourism within the Land Use study area. Regarding residential properties, Alternative 4 would impact the least amount of residential acreage among the five full route alternatives at 1,371 acres (Table 4.15-7). Regarding recreation and tourism, Alternative 4 would impact Johnson Canyon and associated undeveloped portions of the Dome Rock Mountains, while avoiding the actual Copper Bottom Pass area. If the technical OHV qualities of Johnson Canyon were perceived by recreation users to have been degraded, recreational use of the Canyon would reduce and could change the contribution of recreation and tourism to local economies in the Project Area.

Subalternatives to Alternative 4 (4A through 4P)

Impacts under the Subalternatives to Alternative 4 would be effectively the same as for Alternative 4 and the Proposed Action.

4.15.8 Residual Impacts

From a socioeconomic perspective, the primary residual impact would be the ongoing collection of taxes for the life of the Project.

4.15.9 CDCA Plan Compliance

There are no CMAs related to socioeconomics that would apply to the Project.

4.15.10 Unavoidable Adverse Effects

No unavoidable adverse effects are anticipated.

4.15.11 Cumulative Effects

The CEA for socioeconomics is Maricopa and La Paz Counties in Arizona and Riverside County, California. This geographic extent was selected as the CEA because socioeconomic factors, such as public services and utilities are often provided at the county level, and the local labor force is expected to come primarily from within these counties. In addition, statistical data on population, housing demand, and other socioeconomic indicators are typically provided at the county level.

As noted in Section 3.20.4.13, past development and population growth have expanded the demand for housing and increased the available workforce. The Project would not cause existing housing or persons to be displaced or necessitate the construction of replacement housing elsewhere. In addition, there would be no impact from construction workers requiring housing that exceeds the supply of local housing or temporary housing facilities and minimal potential changes in the demand for labor or in local employment. As growth has been accounted for in various local and regional plans and projections and no changes to that growth would be likely to occur as a result of the Project, displacement of and demand for housing and changes in the local labor market would not be considered as cumulative effects and are not discussed further. Given the current workforce in the area and the amount of available housing, cumulative impacts as a result of construction workers on the local housing market are considered to be negligible to moderate during Project construction. A cumulative effect would result if the interaction among the effects of the Project and other past, present, and reasonably foreseeable actions combined.

Section 3.15 describes existing socioeconomic, public services, and utilities conditions within the affected counties and cities. Tables 3.20-5 and 3.20-6 list past, present, and foreseeable projects in the vicinity of the Project. Of the 12 reasonably foreseeable future projects noted, 6 are utility scale renewable energy projects totaling 27,714 acres which would substantially increase developed human use of land. These planned solar energy projects and associated utilities would be supported by the Project. Energy costs would be reduced through increased efficiency of the electric transmission grid, which would also increase revenue to existing electric utilities.

Construction of the Project transmission line in conjunction with renewable energy generation projects (such as solar generating stations) would facilitate the transmission of energy to consumers and may encourage additional development of renewable energy sources.

Construction of the Project would draw on the same labor force as other projects listed in Table 3.20-6, such as the Harquahala Solar Project, the Quartzsite Solar Project, the Blythe Energy Power Plant/Sonoran Energy Project, etc. Construction of these projects could occur at the same time. Although the Project alone would not be likely to generate population migration because of the large available labor pool in the CEA, the demand for construction employment generated by the Project in combination with the other proposed solar and other energy development in the region could increase the demand for skilled labor beyond the capacity of the region to accommodate it. Under such circumstance, the unmet labor demand could result in migration that could change the character of the regional labor force and add new residents to the region.

The Project in conjunction with reasonably foreseeable energy, utility, and other infrastructure projects could support population increases in the area in the foreseeable future. While from a socioeconomic viewpoint this could be positive within the CEA, some members of the public have expressed concern about impacts to the traditional tourism and recreation-based economy. The CEA has a rural character and local communities rely on that character to draw visitors that support their local economy.

4.15.12 Irreversible and Irretrievable Commitment of Resources

The Project would not result in irreversible or irretrievable commitments of socioeconomic resources.

4.15.13 Relationship of Short-term Uses and Long-term Productivity

The Project does not involve trade-offs between short-term uses and long-term productivity from a socioeconomic standpoint.

4.16 ENVIRONMENTAL JUSTICE

4.16.1 Introduction

In Section 3.16, it was determined that one census block group in Maricopa County, three in La Paz County, and five out of six in Riverside County might be considered EJ populations, using conservative assumptions and standards. These EJ populations are enumerated in Table 3.16-4 and shown in Figure 3.16-2, Figure 3.16-3, and Figure 3.16-4 (Appendix 1). Further, the CRIT have been identified as an EJ Population (Section 3.16.3.4).

4.16.2 Methods for Analysis

4.16.2.1 Analysis Area

The EJ study area is the area within 0.5-mile of the Proposed and Alternative segments (Appendix 1, Figure 3.15-1). This is a commonly used buffer distance for EJ study areas. The analysis area includes the study area and all census block groups crossed by the Proposed and Alternative segments; therefore, it extends beyond 0.5 mile. The analysis area includes adjacent and nearby communities that may be affected by the final route.

The census block groups, as defined by the U.S. Census Bureau, do not coincide with the geographic zones used for analysis of most of the other resources in this Technical Environmental Study. Consequently, the zones will not be used in this section.

4.16.2.2 Assumptions

Evaluation of EJ impacts involves assessment of the potential for disproportionately high and adverse impacts on minority or low-income populations. Minority and low-income populations in proximity to the ROW for the Proposed and Alternative segments were identified in Section 3.16, on the basis of US Census data at the census block group level, which is the smallest census area for which the relevant data are available. Census block groups typically include 600 to 3,000 people and, in rural areas, can be quite large in geographic area. For purposes of determining if a block group is considered an EJ population it was assumed to have the same characteristics (e.g., minority or low-income status) uniformly throughout the area in which it is located. In determining if impacts within the block group would be disproportionately high and adverse, aerial photographs were studied to see where the residential and commercial areas are within the block group.

The analysis assumes that all appropriate design features, AMPs, and BMPs would be implemented (Appendix 2A).

4.16.2.3 Environmental Effect Indicators, Magnitude, and Duration

The following indicator was considered when analyzing potential impacts to EJ populations:

- Construction or operation of the Project would have a disproportionately high and adverse effect on identified EJ populations in the area (as defined by EO 12898).

The magnitudes and durations used to describe impacts to EJ populations are the same as those provided in Section 4.1.2.

The CEQ specifically provides guidance that addresses identification of an EJ adverse impact under NEPA:

> Under the National Environmental Policy Act, the identification of a disproportionately high and adverse human health or environmental effect on a low-income population, minority population, or Indian tribe does not preclude a proposed agency action from going forward, nor does it necessarily compel a conclusion that a proposed action is environmentally unsatisfactory. Rather, the identification of such an effect should heighten agency attention to alternatives (including alternative sites), mitigation strategies, monitoring needs, and preferences expressed by the affected community or population (CEQ 1997: 10).

4.16.3 No Action Alternative

Under the No Action Alternative, no ROW would be granted for the Project and the transmission line, SCS, and ancillary facilities would not be constructed. Current conditions in the analysis area described in Section 3.16 would continue under the No Action Alternative.

4.16.4 Construction of Action Alternative Segments

4.16.4.1 Direct and Indirect Effects Common to All Action Alternatives

As described in Section 3.16, several census block groups in the analysis area can be defined as EJ populations under CEQ and BLM guidelines because they either have a proportion of minority residents that is greater than average for the state in which they are located, they have a greater proportion of individuals or families that are living below the poverty level, or both. Most of the potential short-term, negligible to minor adverse impacts on EJ populations associated with construction of the Project would be localized in nature, including noise and other types of disruption occurring during construction; longer-term impacts may affect visual resources and property value. Potential adverse impacts on local housing conditions and the demand for public services during construction, discussed in Section 4.15, would be somewhat more dispersed.

Given these characteristics of the area and the Project, low-income and minority populations would be affected by the Project, regardless of which full route alternative is selected. As shown in Figures 3.16-3 through 3.16-5 (Appendix 1), any reasonably direct route between the two substations crosses two of the four block groups in Arizona where there are EJ populations; any less direct route taken to avoid these block groups would require several times more disturbance, particularly in currently undisturbed or pristine areas. In California, where five of the six block groups in the Analysis Area contain EJ populations, and the Colorado Substation is surrounded by EJ populations, there is no route that would eliminate impacts to EJ populations.

The analysis of effects by resource area provided in this chapter indicates that few, if any, of these impacts would be "high." High impacts, for the purpose of this analysis, are defined as activities that would require the condemnation of multiple residential properties or result in new visual impacts in close proximity to residential properties in previously undisturbed corridors. As the condemnation of multiple residential properties and/or new visual impacts in close proximity to residential properties in previously undisturbed corridors are not expected, these impacts are not anticipated to be "high." In fact, the full route alternatives are adjacent or nearly adjacent to existing transmission lines, interstate highways, or other utility corridors as a means of minimizing new disturbance to either the natural or human environment.

In the case of the alternatives considered here, construction impacts would occur over a relatively short duration. Visual impacts are expected to be low to moderate and effects on property values, would be localized. Potential impacts to air quality as a result of construction are described in the air quality and climate change resources sections (Sections 3.2 and 4.2); local, state, and Federal protocols for estimating impacts to regulated air quality constituents found that impacts resulting from construction would be negligible, including those that would occur in the nonattainment area in Maricopa County and those that would occur in Riverside County. Since these impacts would be negligible and short-term, they would not constitute a disproportionate adverse impact. Impacts to air quality during operations and maintenance phases of the Project would be substantially lower than those during construction.

Low-income and minority populations may also be positively affected by the Project, including the short-term economic stimulus from construction activities and expenditures, short-term and longer-term increases in tax revenues, and added capacity and reduced congestion for electricity transmission. These impacts are likely to be more geographically dispersed than the localized adverse effects.

The La Posa LTVA and private RV parks in and around Quartzsite have seasonal (i.e., temporary) and long-term residents that would not be represented by US Census Bureau data, and as such, it is possible there could be minority and low-income representation exceeding the comparable populations within the EJ comparison area. For the Town of Quartzsite, Arizona CDP, the census data show 4.1 percent minority representation and a low-income population of 9.6 percent.

A portion of Segment p-11 is adjacent to CRIT reservation lands and Segments i-06 and cb-03 would cross CRIT reservation lands. The block group data covering this area show a 98 percent minority population, with 26.5 percent Native Americans. The lands crossed by Segments p-11, i-

06, and cb-03 are all undeveloped and do not include residences. For tribes and tribal members, EJ population issues, if any, are addressed through the consultation process (Sections 3.7 and 4.7). Scoping consultation with the CRIT resulted in a request for further, detailed consultation regarding its lands and adjacent areas.

Direct and indirect impacts from construction would be short term and minor. Given the extent of the Project, impacts such as noise and other disruption would occur relatively briefly at any one locale.

The CRIT have expressed that the Project would constitute an adverse impact to the Tribe that exceeds that of the general population, as they have greater ties to the specific environments and lands encompassing the Project Area. This is discussed in further detail in Section 4.7.

4.16.4.2 Maricopa and La Paz Counties, Arizona

In Maricopa County, Arizona, one block group out of three was identified with a minority population percentage greater than the overall minority population percentage in the EJ comparison area, as shown on Figure 3.16-1 (Appendix 1). Based on aerial imagery, it does not appear that there are any residential, commercial, or industrial uses within a 1-mile corridor along the Proposed and Alternative segments.

In La Paz County, Arizona, three block groups out of ten were identified with minority or low-income population percentages greater than the EJ comparison area percentages; two had higher percentages of low-income population percentage and one had a higher percentage of racial or ethnic minority population. A review of aerial photographs showed that, within a 1-mile corridor along the Proposed and Alternative segments in Block Group 3, Census Tract 201, there is a largely undeveloped natural area with very few residential, commercial, or industrial uses (Appendix 1, Figure 3.16-2). Block Group 2, Census Tract 206.02, and Block Group 2, Census Tract 9403, both run along the eastern bank of the Colorado River, with the first mostly south of I-10 and the second mostly north of I-10 on CRIT lands. CRIT lands are discussed below. A review of aerial imagery shows some development within the EJ study area, or within the 1-mile corridor, for the area of Block Group 2, Census Tract 206.02. This includes open space, agricultural lands, RV parks, and commercial areas.

The La Posa LTVA and private RV parks in and around Quartzsite have seasonal (that is, temporary) and long-term residents that would not be represented by US Census Bureau data. Although the characteristics of this population are not documented in the US Census data, it is possible there could be minority and low-income representation exceeding the comparable populations within the EJ comparison area. For the Town of Quartzsite, Arizona CDP, the census data show 4.1 percent minority representation and a low-income population of 9.6 percent.

A portion of Segment p-11 is adjacent to CRIT reservation lands and Segments i-06 and cb-03 would cross CRIT reservation lands. The block group data covering this area show a 98 percent minority population, with 26.5 percent Native Americans. The lands crossed by Segments p-11, i-06, and cb-03 are all undeveloped and do not include residences. For tribes and tribal members EJ issues, if any, are addressed through the consultation process. Scoping consultation with the CRIT resulted in a request for further, detailed consultation regarding its lands and adjacent areas (Section 3.7 and Section 4.7).

Direct and Indirect Effects Common to All Segments in the Zone

Direct and indirect impacts from construction would be short-term and minor. Given the extent of the Project, impacts such as noise and other disruption would occur relatively briefly at any one locale.

Direct and Indirect Segment-specific Effects

Segment-specific direct and indirect effects from construction would be the same as for all segments (Section 4.16.4.1).

4.16.4.3 Riverside County, California

In Riverside County, California, five of the six block groups have minority and/or low-income populations greater than the EJ comparison area percentages. Four of the block groups have minority population percentages greater than the EJ comparison area's minority population percentage, and four of the block groups have a low-income population percentage greater than the comparison areas. As shown in Figure 3.16-2 (Appendix 1), there are commercial and recreational uses, including those along the Colorado River's banks, as well as residences and agricultural uses.

Income data for the city of Blythe CDP and the CCD area of Blythe reveal that both have a low-income population of about 24 percent. Ripley CDP, which is south of Blythe, has the highest low-income population percentage at 33.7 percent, while Mesa Verde CDP has the second highest (24.6 percent) of the CDPs and CCDs evaluated. These local areas along the Proposed Action and Alternative Segments have low-income percentages that are greater than the EJ populations comparison area low-income population percentage of 17.0.

Direct and Indirect Effects Common to All Segments in the Zone

Direct and indirect impacts from construction would be short-term and minor. Given the extent of the project, impacts such as noise and other disruption, would occur relatively briefly at any one locale.

Direct and Indirect Segment-specific Effects

Segment-specific direct and indirect impacts from construction would be the same as for all segments (Section 4.16.4.1).

4.16.5 Operations, Maintenance, and Decommissioning

During operations and maintenance there would be negligible activity on the ground, and, therefore, negligible impacts to EJ populations. Decommissioning impacts would be similar to those described for construction.

4.16.6 Mitigation Measures

There are no MMs identified for EJ populations for any of the specific segments and, thus, no MMs have been identified for any of the full route alternatives or subalternatives described below.

The Project has been designed to utilize existing utility corridors and avoid environmentally sensitive areas to the extent possible.

4.16.7 Construction of Full Route Alternative and Subalternative Effects

While there is some difference among the Proposed Action and full route alternatives, including applicable subalternatives, the short-term, negligible to minor impacts on EJ populations would be similar between all alternatives.

4.16.8 Residual Impacts

Development of the new transmission line may have some residual impacts on property values near the transmission line. Any impacts would likely be modest due to the predominantly low-density rural setting and the presence of existing transmission and utility lines nearby.

4.16.9 CDCA Plan Compliance

There are no CMAs related to EJ populations that would apply to the Project.

4.16.10 Unavoidable Adverse Effects

Identified EJ populations would likely experience adverse impacts on a localized basis from construction, operation, maintenance, and decommissioning of the Project. As discussed previously, these adverse impacts are all expected to be minor at most and distributed equally among EJ and non-EJ populations (i.e., not disproportionately). Since EJ population areas would need to be crossed regardless of the Action Alternative selected, this would be an unavoidable adverse impact.

As noted in Section 4.7.10, the CRIT have expressed that the Project would result in adverse impacts on the CRIT that appreciably exceed those of the general population, as development impacts their ancestral ties to the land. Consultation with the CRIT will be ongoing in an effort to address impacts.

4.16.11 Cumulative Effects

The EJ population CEA includes the three-county area and the block groups used for evaluating impacts. Like most proposed transmission lines, the proposed routes, under the various alternatives, would use the corridors of existing linear features (such as transmission lines, roads, pipelines, and railroads) as much as possible. Co-locating with existing linear infrastructure tends to minimize environmental and social impacts and avoid relatively undisturbed areas.

Co-locating a new transmission line in an area that already has existing transmission facilities or other linear infrastructure would add incrementally to any existing impacts from that infrastructure on visual resources, quality of life, property values, and other aspects of nearby properties. It is likely, however, that the incremental impact of adding an additional transmission line in areas that already have linear infrastructure in place would not be a major cumulative effect since visual and property value impacts would have already taken place, therefore co-location would result in less impact than adding a new transmission line in an area without existing linear facilities.

Almost all of the EJ population communities that could be affected by construction and operation of the Project already have existing transmission lines in place. Development of a new transmission line in these areas would likely have a smaller cumulative impact than in areas without such existing linear features.

There would be no permanent or temporary displacement of low-income or minority businesses or residents under the proposed Project to contribute to potential cumulative impacts on minority populations. The health and safety of these populations would be protected during both construction and operation at the same levels as other populations by implementing the safety measures described in the APMs and BMPs, and other protocols described in Chapter 2, as well as other resource-specific mitigations plans, such as the Hazardous Materials Management Plan (to be completed before a NTP would be issued) (Section 4.13.2.2). It is assumed that future projects would be required to mitigate any significant impacts on these populations; therefore, cumulative impacts on minority and low-income populations as a result of the Project in combination with reasonably foreseeable future projects also would be minimal.

As noted in Section 4.7.11, the cumulative development within and around the CEA has had the effect of substantially altering the native landscape of affiliated Indian tribes, including the CRIT. Consultation with the CRIT is ongoing. As expressed by the CRIT, the continued development and alteration of the landscape cumulatively contributes to impacts on the cultural landscape and the deep connection the CRIT have with the land, natural and cultural resources, and wildlife.

4.16.12 Irreversible and Irretrievable Commitment of Resources

The Project would not result in irreversible or irretrievable commitments to EJ populations.

4.16.13 Relationship of Short-term Uses and Long-term Productivity

There would be no short-term uses versus long-term productivity conflicts to EJ populations as a result of the implementation of the Project.

4.17 TRAFFIC AND TRANSPORTATION

4.17.1 Introduction

Impacts to transportation are discussed in terms of changes in vehicular traffic on primary roads, changes in traffic and access to BLM roads and lands, consistency with Federal, state, and local transportation plans, and changes in air traffic patterns at airports.

4.17.2 Methods for Analysis

4.17.2.1 Analysis Area

The traffic and transportation study area includes a 5-mile buffer on either side of the Proposed and Alternative segments to create a 10-mile-wide corridor. A 10-mile-wide corridor allows for the identification of roadways and aviation facilities that could potentially be affected by the Project and provides some flexibility of Project routing and design.

4.17.2.2 Assumptions

No assumptions were necessary when performing the analysis of Project impacts on traffic and transportation.

4.17.2.3 Environmental Effect Indicators, Magnitude, and Duration

Impacts to transportation, traffic, and public access resources would occur if:

- Project-related increases in traffic exceed a LOS established by the local and state transportation management agencies;
- The Project results in traffic delays on a primary transportation corridor;
- Road dust and/or severe road damage occur at levels that create hazardous situations for motorists and pedestrians;
- Impacts to the BLM roadway system including improved access into remote or designated roadless or wilderness areas resulting from the Project;
- Changes in air traffic patterns result from new structures and lines near airports, including MTRs;
- The Project causes an increase in aviation safety risks;
- The Project impedes or results in inadequate emergency services;
- The Project conflicts with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the traffic circulation system, or an applicable traffic congestion management program;
- Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;
- Substantially increase hazards due to a design feature such as sharp curves or dangerous intersections or incompatible uses;
- Result in the loss of authorized access to private parcels, state trust lands, mining claims, utility corridors, communication sites, or other existing authorized lands or improvements.

Impacts to traffic and transportation may be negligible, minor, moderate, or major, and may have durations that are qualified as temporary, short term, or long term (Table 4.17-1, Section 4.1).

Table 4.17-1 Traffic and Transportation Impact Magnitude and Duration Definitions

ATTRIBUTE OF IMPACT		DESCRIPTION SPECIFIC TO RECREATION
Magnitude	Negligible	A change in current traffic or transportation conditions that is too small to be physically measured using normal methods or perceptible to a human observer. There are no required changes in management or utilization of the transportation system.
	Minor	A change in current traffic or transportation conditions that is just measurable with normal methods or barely perceptible to a human observer. The change may affect individuals or a small portion of transportation system users but does not result in an effect to the overall user population, or the value or productivity of traffic or transportation. There are no required changes in management or utilization.
	Moderate	An easily measurable change in current traffic or transportation conditions that is readily noticeable to a human observer. The change affects a substantial quantity of individuals or similar portion of users of a transportation system which may lead to an effect to the overall user population, or the value or productivity of traffic or transportation. There are some required changes in management or utilization.
	Major	A large measurable change in current traffic or transportation conditions that is easily recognized by all human observers. The change affects the majority of individuals of a user population which leads to significant modification of the value or productivity of traffic or transportation. There are profound or complete changes in management or utilization. An effect that is not in compliance with applicable regulatory standards or thresholds.
Duration	Temporary	Limited to active construction or decommissioning.
	Short-term	10 years or less.
	Long-term	More than 10 years.

4.17.3 No Action Alternative

Under the No Action Alternative, no ROW would be granted for the Project and the transmission line, SCS, and ancillary facilities would not be constructed. Current surface, air, and freight and rail transportation in the analysis area described in Section 3.17 would continue under the No Action Alternative. There would be no changes that would alter existing traffic and transportation beyond current conditions.

4.17.4 Construction of Action Alternative Segments

4.17.4.1 Direct and Indirect Effects Common to All Action Alternatives

During the construction phase, traffic would be generated by surveying, geotechnical investigation, access road construction, foundation installation, laydown yard/receiving, structure hauling, structure assembly, structure erection, wire stringing, reclamation, and clean-up. Some types of traffic would include large trucks and potentially oversized loads delivering construction equipment and steel structure components. Various phases of construction would occur at different locations throughout the construction process, and in some cases at the same time at different locations. Construction traffic would occur on I-10, US 95, AZ 95, Business Route 10, roads and streets in Quartzsite and Blythe, utility/recreation access roads, and various local roads and dirt trails on BLM-administered land and private property. Construction in the Quartzsite area that occurred during January through March, and resulted in delays, detours, or other changes to the roadway system in the area, would have greater effects on traffic and transportation than in other areas because of the unique influx of visitors each winter; peak traffic in January is approximately seven times the peak traffic of July and the Town of Quartzsite's roadways are congested during this period. This minor to moderate effect would be site-specific and temporary.

Under a maximum-case trip scenario (one crew shift each day, every worker drives alone on the same access route, and all crew types work simultaneously) (Tables 2.2-9 and 2.2-10), an estimated total of 160 additional personal vehicles would be added to the roadway network before and after each shift. Deliveries would be spread throughout the day and would not contribute to a noticeable volume increase on the roadway networks. The cumulative additional volume would represent a volume increase of 1 percent or less on various segments of I-10 and US 95 and would not cause a change in the LOS. The maximum-case additional vehicle scenario of 160 vehicles per day would not exceed the 400-vehicle upper limit for lightly traveled or dirt roads (Transportation Research Board 2000) in the analysis area. Construction would not cause severe road damage because construction would be short term, and roads used for construction would either already be at the appropriate design level for the construction traffic or would be modified to the appropriate design level. In areas where the Project would cross roadways, Federal, state, or county encroachment permits would be obtained, as applicable.

Construction on native surface (dirt) roads is unlikely to generate fugitive dust at levels that would affect motorists; further, in general the dirt roads in the analysis area are lightly used. Construction traffic would not create consistent long-term delays on the primary roadways. Large construction vehicles and potential oversized load deliveries would move slower than normal traffic. Therefore, a temporary decrease in level of service for the primary roads would not occur as a result of the construction activities.

Temporary, short-term traffic delays during construction could occur at locations where the transmission line crosses roads or where improvements might be needed at local roads, intersections, and bridges to accommodate overweight or oversize delivery vehicles. Under APM-TT-01, emergency service providers would be notified of the timing, location, and duration of construction activities on the roadways, and traffic control devices and signs would be used as needed (Appendix 2A).

Construction could cause a hazard to aviation if helicopters were used in the vicinity of aviation facilities. However, this access method would not be necessary in the vicinity of any aviation facilities (Tables 2.2-3 and 2.4-5), and the ground construction equipment used would not be high enough to affect general aviation. However, the use of helicopters to construct the Project in Copper Bottom Pass would constitute an aerial hazard to AGFD aircraft conducting wildlife surveys in Copper Bottom Pass. BMP-TT-10 (Appendix 2A) would require DCRT to coordinate with AGFD to ensure that the use of helicopters for construction in Copper Bottom Pass would not conflict with or cause an aerial hazard to AGFD aircraft.

4.17.4.2 East Plains and Kofa Zone

Direct and Indirect Effects Common to All Segments in the Zone

The effects common to all segments in the zone are the same as those in Section 4.17.4.2.

Direct and Indirect Segment-specific Effects

As proposed, there would be approximately 30 miles of new Type C or D access road constructed in the East Plains and Kofa Zone, which would increase the road density of “unclassified roads and trails” by 3 percent. This would be a negligible to minor increase in access within the East Plains and Kofa Zone. The Alternative SCS 12kV distribution line would follow an existing road.

Aviation facilities would be within the analysis area for Segments p-01, p-04, p-05, p-06 and d-01 (Tonopah Airport and Mauldin Airstrip); however, all of these facilities would be greater than 0.5-mile from the Project. The Salome Emergency Airstrip is also within the analysis area for several segments (and within 0.5-mile of Segment x-03); however, this facility is not actively used or operated, and effects to this facility would be negligible.

4.17.4.3 Quartzsite Zone

Direct and Indirect Effects Common to All Segments in the Zone

The effects common to all segments in the zone are the same as those in Section 4.17.4.2.

Direct and Indirect Segment-specific Effects

As proposed, there would be approximately 1 mile of new Type C or D access road constructed in the Quartzsite Zone, which would increase the road density of “unclassified roads and trails” by less than 1 percent. This would be a negligible to minor increase in access within the Quartzsite Zone. There are no aviation facilities within the analysis area for the segments in the Quartzsite Zone.

4.17.4.4 Copper Bottom Zone

Direct and Indirect Effects Common to All Segments in the Zone

The effects common to all segments in the zone are the same as those in Section 4.17.4.2.

Direct and Indirect Segment-specific Effects

As proposed, there would be approximately 7 miles of new Type C or D access road constructed in the Copper Bottom Zone, which would increase the road density of “unclassified roads and trails” by 2 percent. This would be a negligible to minor increase in access within the Copper Bottom Zone.

Aviation facilities would be within the analysis area for Segments i-06 and i-07 (Cyr Aviation Airport and Blythe Service Center Heliport); however, all of these facilities would be greater than 0.5-mile from the Project. The use of helicopters to construct the Project on Segments cb-01, cb-02, cb-03, and cb-04 would constitute an aerial hazard to AGFD aircraft conducting wildlife surveys in Copper Bottom Pass. BMP-TT-10 (Appendix 2A) would require DCRT to coordinate with AGFD to ensure that the use of helicopters for construction in Copper Bottom Pass would not conflict with or cause an aerial hazard to AGFD aircraft.

4.17.4.5 Colorado River and California Zone

Direct and Indirect Effects Common to All Segments in the Zone

The effects common to all segments in the zone are the same as those in Section 4.17.4.2.

Direct and Indirect Segment-specifics Effects

As proposed, there would be approximately 6 miles of new Type C or D access road constructed in the Colorado River and California Zone, which would increase the road density of "unclassified roads and trails" by 2 percent. This would be a negligible to minor increase in access within the Colorado River to California Zone.

Private aviation facilities would be within the analysis area for Proposed Action Segments p-15w and p-16 and all of the Alternative Segments (Cyr Aviation Airport, Blythe Service Center Heliport, and Clayton Heliport); except for the Cyr Aviation Airport, all of these facilities would be greater than 0.5-mile from the Project. The Cyr Aviation Airport would be within 0.3-mile of Segment ca-05; therefore, the collision hazard would be a moderate to major effect on this facility. Voluntary marking of the structures and lines (MM-TT-01) would reduce this effect to minor to moderate.

The only public facility in the traffic and transportation analysis area is the Blythe Airport. Segments ca-06, ca-07, and ca-09, are within the Zone E Compatibility Zone of the Blythe Airport. An FAA airspace review is required for structures proposed in Zone E that would be greater than 100 feet tall (Riverside County 2003 [as amended 2004]). The findings of the final FAA airspace analysis of the Project for this location (Aeronautical Study No. 2017-AWP-3724-OE) found that the proposed structure heights would "not exceed obstruction standards and would not be a hazard to air navigation" (FAA 2017). Therefore, Segments ca-06, ca-07, and ca-09 would have negligible impacts on the Blythe Airport.

4.17.5 Operations, Maintenance, and Decommissioning

The addition of Project access roads in the analysis area would increase public access into and through BLM land, which could include increased access into remote areas.

After construction of the Project, traffic generated by operation and maintenance activities would be intermittent, only require a small number of vehicles, and deliveries would not regularly occur. Operation and maintenance traffic would not increase traffic on primary roads, and, subsequently, would not decrease the level of service for any primary roads.

The FAA does not have jurisdiction or authority over private facilities. Operation of the Project may represent a collision hazard to pilots accessing private aviation facilities, such as the Cyr Aviation Airport, if structures are adjacent (within 0.5-mile) to the facility. This would be a moderate to major, long-term impact on such private aviation facilities. Marking of structures and lines at these locations would reduce the impact to minor to moderate (Section 4.17.6, MM-TT-01). The public Blythe Airport is discussed in Section 4.17.4.5. Additionally, structures and lines where they pass through the Plomosa and Dome Rock Mountains would constitute a moderate to major, long-term effect on the safety of AGFD aircraft conducting aerial wildlife surveys. The marking of structures and lines in these locations would reduce this effect to minor to moderate (MM-TT-02, Section 4.17.6).

MTRs are located within the traffic and transportation analysis area. The structures associated with the Project would range between 72 and 195 feet in height; the DOD has requested that Project structures remain less than 199 feet in height to avoid impacts to MTRs (DOD 2016). Further, Project structures located within an MTR would be fitted with night-vision compatible red lighting emitting an infrared energy between 675 and 900 nanometers (APM-TT-02).

Decommissioning activities would have generally the same impacts to traffic and transportation resources as described for construction.

4.17.6 Mitigation Measures

There would not be any MMs necessary related to construction. Mitigation related to operations would include:

MM-TT-01: Structures within Segment ca-05 would constitute a moderate to major, long-term effect associated with a collision hazard at the Cyr Aviation Airport. The voluntary marking of structures and lines within 0.5-mile of such facilities with spherical markers and lighting would reduce this effect to minor to moderate.

MM-TT-02: Structures and lines within Segments in-01 and i-04 where they pass through the Plomosa Mountains and Segments i-06, cb-01, cb-02, cb-03, and cb-04 in the Dome Rock Mountains would constitute a moderate to major, long-term effect on the safety of AGFD aircraft conducting aerial wildlife surveys. The marking of structures and lines in these locations would reduce this effect to minor.

Further, the applicant has committed to APMs, and the BLM-developed required BMPs, that would further reduce impacts to traffic and transportation (Appendix 2A).

4.17.7 Construction of Full Route Alternative and Subalternative Effects

4.17.7.1 Proposed Action

The effects to traffic and transportation would be the same as those described in Sections 4.17.4.1 and 4.17.5. The amount of Type C and D roads in the traffic and transportation analysis area would increase by 2 percent. This would be a negligible to minor impact on the density of unclassified roads and trails in the analysis area.

4.17.7.2 Alternative 1: I-10 Route

Alternative 1 would impact the Cyr Aviation Airport (Segment ca-05). With MM-TT-01 (Section 4.17.6) this impact would be reduced to minor to moderate. Structures and lines on Segments i-04 and i-06 would pose a minor to moderate long-term aviation hazard to AGFD aircraft; with MM-TT-02 this impact would be reduced to minor and long term. The amount of Type C and D roads in the traffic and transportation analysis area would increase by 3 percent, which is similar to that under the Proposed Action.

Subalternatives to Alternative 1 (1A through 1E)

Subalternative 1E would avoid the Cyr Aviation Airport, and Segment in-01 rather than Segment i-04 would pose a minor to moderate long-term aviation hazard to AGFD aircraft that would be mitigated by MM-TT-02. The other subalternatives would have similar impacts to those under Alternative 1.

4.17.7.3 Alternative 2: BLM Utility Corridor Route

The effects to traffic and transportation would be the same as those described in Sections 4.17.4.1 and 4.17.5, except structures and lines on Segment i-04 would pose a minor to moderate long-term aviation hazard to AGFD aircraft. With MM-TT-02 this impact would be reduced to minor and long term. The amount of Type C and D roads in the traffic and transportation analysis area would increase by 3 percent, which is similar to that under the Proposed Action.

Subalternatives to Alternative 2 (2A through 2E)

The subalternatives would have similar impacts to those under Alternative 2.

4.17.7.4 Alternative 3: Avoidance Route

The effects to traffic and transportation would be the same as those described in Sections 4.17.4.1 and 4.17.5, except structures and lines on Segment i-04 would pose a minor to moderate long-term aviation hazard to AGFD aircraft. With MM-TT-02 this impact would be reduced to minor and long term. The amount of Type C and D roads in the traffic and transportation analysis area would increase by 3 percent, which is similar to that under the Proposed Action.

Subalternatives to Alternative 3 (3A through 3M)

The subalternatives to Alternative 3 would have similar impacts to those under Alternative 3.

4.17.7.5 Alternative 4: Public Lands Emphasis Route

The effects to traffic and transportation would be the same as those described in Sections 4.17.4.1 and 4.17.5, except structures and lines on Segment in-01 would pose a minor to moderate long-term aviation hazard to AGFD aircraft. With MM-TT-02 this impact would be reduced to minor and long term. The amount of Type C and D roads in the traffic and transportation analysis area would increase by 3 percent, which is similar to that under the Proposed Action.

Subalternatives to Alternative 4 (4A through 4P)

The subalternatives to Alternative 4 would have similar impacts to those under Alternative 4, except an additional segment, Segment i-04, would pose a minor to moderate long-term aviation hazard to AGFD aircraft that would be mitigated by MM-TT-02.

4.17.8 Residual Impacts

After MM-TT-01, there would still be minor to moderate residual impacts to the Cyr Aviation Airport related to a collision hazard with the Project structures and lines. After MM-TT-02, there would still be a minor residual aviation hazard to AGFD aircraft flying wildlife surveys in the Plomosa and Dome Rock Mountains.

4.17.9 CDCA Plan Compliance

CMAs LUPA-BIO-13 and DFA-VPL-BIO-DUNE-1 would apply to the Project (Appendix 2C). The Project would comply with these CMAs through BMP-TT-04, BMP-TT-05, BMP-TT-06, BMP-TT-07, and BMP-TT-08 (Appendix 2A).

4.17.10 Unavoidable Adverse Effects

After M-TT-01, the collision hazard to the Cyr Aviation Airport would remain an unavoidable adverse effect. After MM-TT-02, the aviation hazard to AGFD aircraft flying wildlife surveys in the Plomosa and Dome Rock Mountains would remain an unavoidable adverse effect.

4.17.11 Cumulative Effects

Past and present construction of linear projects such as roads and transmission lines has occurred throughout the CEA, with negligible impact on primary roadway traffic. Once constructed, new roads have had a beneficial impact on primary roadway traffic by improving the transportation network and conforming to long-term transportation plans. The construction of roads on or near BLM-administered land has increased public accessibility to BLM roads and roadless areas.

Reasonably foreseeable actions in the analysis area that have the potential to result in cumulative impacts on the transportation system include future transmission and utility scale solar generation projects, and improvements to existing transportation facilities according to state and local plans. The construction of these future projects (Table 3.20-6) would generate minor short-term traffic on primary roadways; however, it is unlikely that construction would occur at the same time and location as construction of the Project. These projects would be expected to be in conformity with future transportation plans. Any project that is within the vicinity of an airport would be expected to consult with the airport to ensure conformity with airport operations and plans. Therefore, there would not be a cumulative impact to traffic on primary roadways, future transportation plans, and airports.

Cumulative effects on transportation and public access resulting from the Project would have the potential to occur if vehicle traffic from other reasonably foreseeable projects traveled the same roadways at the same time as traffic from the Project. Construction-related traffic effects would mostly result from increased construction (and decommissioning) traffic on the regional roadways. Operation and maintenance of the Project or the Action Alternatives would have minimal transportation or traffic needs associated with them other than for maintenance activities. Therefore, the only opportunity for cumulatively significant transportation and/or traffic effects to occur would be during the construction phase (1.5 – 2 years) of the Project and the decommissioning phase.

When combined with the new access roads that would be constructed for the Project, the construction of new roads to facilitate access to other new transmission lines and generation projects would be expected to increase public access to BLM roads and roadless areas. However, there would be minimal potential to open access to land areas where it is not currently available and no large expanses of land that are currently inaccessible would become available because of the existing network of roads and trails, Therefore, the cumulative impact of new access roads constructed as part of the Project and reasonably foreseeable actions would be considered a long-term, minor impact.

Impacts of the Project related to roadway deterioration would be reduced with implementation of BMP-TT-09, which would require restoration of local roads if damaged as a result of the Project. Reasonably foreseeable future projects would be expected to be required to implement similar measures. Consequently, any damage to roadways would be expected to be repaired by Project applicants (or funds contributed by Project applicants) and adverse cumulative effects would not occur.

There are few airports in the CEA and few if any of the reasonably foreseeable future projects would be in proximity to them. Similar to the Project, conflicts between reasonably foreseeable future projects and air traffic would be expected to be resolved between the affected airport and the applicant of the specific project; therefore, no cumulative effects would result.

4.17.12 Irreversible and Irretrievable Commitment of Resources

The Project would constitute a small irretrievable impact to traffic on primary roads during construction; however, construction-related impacts to traffic on primary roads would cease following construction.

4.17.13 Relationship of Short-term Uses and Long-term Productivity

The Project would generate short-term uses of existing transportation facilities by increasing traffic on primary roads and causing temporary traffic disruptions during construction. However, these short-term uses would not affect the long-term productivity of the primary roads.

4.18 VISUAL RESOURCES

4.18.1 Introduction

Impacts to visual resources are discussed in terms of the visual impact of contrast between the Project and surrounding landscape, conformance with established Federal and local requirements for management of visual resources, and plan amendment requirements to achieve conformance.

4.18.2 Methods for Analysis

4.18.2.1 Analysis Area

Impacts to visual resources are analyzed for portions of the study area (Section 3.18.2) where the Project would be visible, as documented by the KOPs.

4.18.2.2 Assumptions

The analysis assumes that:

- All appropriate design features, APMs, BMPs, and any additional monitoring and MMs included in Section 4.18.6 would be implemented. All categories of these would be mandatory, and where applicable would be in place before construction begins.
- The selected KOPs are representative of the views of the majority of sensitive viewers in the Project Area.

4.18.2.3 Environmental Effect Indicators, Magnitude, and Duration

Impacts to visual resources would occur if:

- Project-related changes would reduce scenic quality rating scores based on the BLM VRI system;
- The Project results in major and unmitigated visual changes that degrade or disrupt views of scenic landscapes from highly sensitive viewing locations such as parks, residences, historic monuments, scenic trails, community gateways, and other culturally or regionally important viewpoints;
- The Project conflicts with visual standards, ordinances, or policies established by the BLM (VRM classes), other potentially affected Federal entities, or other state, county, or local agencies;
- The Project results in visual intrusion or disruption to a viewshed of recognized cultural significance (e.g., eligible for registration with the NRHP, or identified as a TCP);
- The Project results in visual resource contrast ratings that conflict with the management goals of assigned VRM or interim VRM classes;
- RMP amendments associated with the Project reduce VRM class objectives that would be required for projects proposed in the area;
- The Project has a substantial adverse effect on a scenic vista;
- The Project substantially degrades the existing visual character or quality of the site and its surroundings; or
- The Project creates a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

Units of measures will include:

- Scenic Quality Classification – Classes A, B, & C;
- Sensitivity Classification – high, medium, and low;
- Distance zones – foreground-middle ground, background, seldom seen;
- VRI Classes I, II, III, & IV;
- Level of visual contrast; and

- Conformance to VRM class objectives for Classes I, II, III, & IV.

4.18.2.4 Visual Contrast Rating

The BLM performs a process called contrast rating, as described in Manual H-8431-1 (BLM 1986b), Visual Resource Contrast Rating, to analyze potential visual impacts of proposed projects and activities. The degree to which a management activity affects the visual quality of a landscape depends on the visual contrast created between a project and the existing landscape. The basic design elements of form, line, color, and texture are used to make this comparison and to describe the visual contrast created by the Project (Section 3.18.1.1). This assessment process provides a means for determining visual impacts and for identifying measures to mitigate these impacts. The 10 environmental factors were analyzed to determine specific effects observed from each KOP (Section 3.18.2.1). When the views from KOPs were found to not meet the VRM classes established for the viewed area that would be impacted by the Project, analysis was used to determine the scope of the effect and establish boundaries for VRM class changes, which would both address the issue of Project non-conformance as well as provide for future manageability of the area by the BLM. Visual Contrast Rating Worksheets were completed for all KOPs, which provide detailed analysis of visual impacts as determined from each KOP, and are provided in Appendix 3C.

4.18.2.5 Simulations

KOPs were selected for simulation to aid in analysis of:

- Segments perceived to be non-conforming to VRM class objectives,
- Non-BLM publicly sensitive areas, and
- Generally representative areas.

Simulations were used to aid in visualization and description of Project impacts, and determinations for appropriate MMs and RMP amendments. Simulations were prepared using models of proposed structure types and estimated structure locations placed along the centerline for the simulated segments. Due to the desert environment where the Project is proposed, reclamation and revegetation would be a slow and long-term prospect, with limited expected recovery. Where possible and estimated to be visible, ground disturbance at the bases of the structures was also simulated. In many cases, access disturbance would be required for structure construction, and would have long-term visual effects similar to ground disturbance at the structure bases. However, specific access routes have not been proposed or estimated for the Project, and due to the level of subjectivity, could not be simulated.

The majority of structures for the Project are proposed to be guyed V structures. Analysis of impacts to recreation found that guyed V structures pose an unacceptable human health and safety risk to OHV recreationists in heavily used recreation areas, such as the vicinity of the LTVA and Copper Bottom Pass. To address this safety risk, self-supporting lattice structures with matching color and span lengths to match the existing DPV1 structures or monopoles would replace the guyed V structures in certain locations as mitigation to eliminate the hazards associated with guy wires. However, these required changes in structures in certain areas also affect the visual resources analysis. Where structure changes would be required in areas simulated, additional simulations were prepared showing the replacement structure types.

4.18.2.6 Analysis of KOPs/Segments not Simulated

Simulations were also used to be representative of visual impacts as a guide to analysis of KOPs/segments not simulated. While the 10 environmental factors were evaluated in the visual contrast rating process for each KOP, in collectively reviewing Project simulations, it was found that the distance between the viewer and the Project (proximity), structure form contrast, background/skylining of infrastructure, and intervening vegetation/topography had relatively consistent, and therefore predictable visual impacts. Therefore, these visual elements were used to estimate visual impacts for KOPs/segments not simulated.

When viewers are proximal to the large structures (such as driving the road through Copper Bottom Pass, where existing structures are a few hundred feet away, adjacent to the road) and overall infrastructure of a transmission line is similar to the Project, the infrastructure has “presence” for the viewer. Viewers see and sense the largeness of the structures and other infrastructure in comparison to themselves, their vehicle, and the surrounding landscape. Apart of visibility, viewers can experience noise created by wind moving around the conductors or crackling. When the Project would have “presence” for the viewer it would be a major modification to and dominate the visual environment. Distance between the viewer and the Project was found to be the primary indicator of “presence,” level of modification, and dominance.

The following examples of transmission structure visibility in the Project Area provide a gradient of viewer proximity, demonstrate how these factors affect the visual impact that the Project would have, and how the factors can be applied to non-simulated KOPs/segments to make conformance determinations.

From KOP 1 (simulated; Appendix 1, Figure 4.18-1) viewers would be approximately 2 miles from the closest point of the Project along Segment d-01. At 2 miles distant where the Project infrastructure would be viewed against a background of somewhat scenic topography, the Project (and the existing monopole structures connecting the Delaney Substation to the Harquahala Power Plant) would essentially not be visible, understanding that time of day, atmospheric, and lighting conditions could somewhat affect visibility.

From KOP 7 (not simulated; Appendix 1, Figure 3.18-11) viewers would be approximately 1 mile from the closest point of the DPV1 transmission line along Segment p-01. The self-supporting lattice structures would be visible and barely noticeable where skylined, but difficult to discern against the mountainous backdrop. Where visible, the structures form would be unclear and the conductors would not be visible.

From KOP 19, (simulated; Appendix 1, Figure 4.18-2) viewers would be approximately 1.25 miles from the closest point of the Project along Segment in-01. Similar to KOP 7, due to distance, the structures would appear very small in the landscape; due to intervening topography, only the tops would be visible and form would be indistinguishable. Due to intervening vertical vegetation (primarily saguaro cactus), the structures would be barely distinguishable and not noticeable, and the conductors would not be visible. Segment in-01 would be located within a BLM utility corridor and would meet VRM Class III objectives, as viewed from KOP 19.

From KOP 20, (simulated; Appendix 1, Figure 4.18-3a) viewers would be approximately 0.5-mile away from the Project along Segment in-01. Where skylined, structures would be visible and somewhat noticeable, but would not be detectible against a backdrop of rugged mountains. Structure form would be distinguishable, but conductors would not be visible. Segment in-01 would be located within a BLM utility corridor and would meet VRM Class III objectives, as viewed from KOP 20.

From KOP 20, (simulated; Appendix 1, Figure 4.18-3b) viewers would be approximately 0.2-mile away from the Project along Segment i-04. In this view, because of proximity to the structures, they would begin to appear larger than some of the surrounding landforms. Where skylined, structures, conductors, and guy wires would be clearly visible and attract attention. With a backdrop of low rugged hills, structures would be visible but not noticeable, and conductors and guy wires would not be visible. Structure form would be distinctive. While Segment i-04 would be located within a BLM utility corridor and would meet VRM Class III objectives, as viewed from KOP 20, this area is used for OHV recreation, and viewers would be expected to be traveling in closer proximity to the Project. In this case, the Project would dominate the surrounding landscape and would not conform to VRM Class III objectives.

From KOP 17, (simulated; Appendix 1, Figure 4.18-4) viewers would be approximately 0.3-mile away from the Project along Segment i-03. Structures would be partially skylined and partially visible against a backdrop of distant mountains with hazy atmospheric conditions. The structures and their form would be noticeable. The portion of Segment i-03 located within a BLM utility corridor would meet VRM Class III objectives, as viewed from KOP 17.

From KOP 37, (simulated; Appendix 1, Figure 4.18-5a) viewers would be less than 0.2-mile away from the Project along Segment p-13. Because of the proximity of the viewer to the structures and the distance between the structures and the backdrop of rugged mountains, the structures would be much larger than the surrounding scenery, the conductors and guy wires would be clearly visible, and the contrast between the form of the guyed V structures and the self-supporting lattice structures of the DPV1 transmission line would be evident. As structures recede in the distance, the conductors and guy wires quickly would become invisible and the form contrast would transition to less noticeable and then undetectable with greater distance. However, this area is heavily used for OHV recreation, with routes essentially paralleling and winding around the existing DPV1 structures. Therefore, a portion of the structures would appear to recreationists as the closest structures. The Project, in conjunction with the DPV1 transmission line would be a major modification and would dominate the surrounding landscape and therefore would not conform to VRM Class III objectives.

Further, as previously described, the BLM has determined that in heavily recreated areas, guy wires could pose an unacceptable risk to OHV recreationists. Therefore, in situations such as the one simulated in KOP 37, the structures would be replaced with self-supporting lattice structures to eliminate guy wires, which would also repeat the form and lines of the existing DPV1 infrastructure (Appendix 1, Figure 4.18-5b). However, despite the replacement of structure type and application of other MMs, such as dulling or coloring of structure surfaces, the Project would continue to not meet VRM class objectives, and an RMP amendment would be required.

Generally speaking, in the Project Area environment, when the viewer is less than 0.3-mile away from the Project, the structures would begin to appear larger than the surrounding landforms; the conductors and guy wires would be clearly visible; and the infrastructure would become a major modification and dominate views, and would not conform to VRM Class III objectives.

4.18.3 No Action Alternative

Under the No Action Alternative, a ROW would not be granted for the Project and the transmission line, SCS, and ancillary facilities would not be constructed. The visual resources of the lands on which the Project is proposed would continue to be managed as it currently directed by the various applicable BLM RMPs and other local planning ordinances and guidelines. Lands in the analysis area would remain as is, which is primarily undeveloped desert or agricultural land. Current visual resources in the analysis area would be unchanged under the No Action Alternative. There would be no changes that would alter views, view sheds, scenic quality, or sensitivity levels of the scenic resources beyond current conditions.

4.18.4 Construction of Action Alternative Segments

4.18.4.1 Direct and Indirect Effects Common to All Action Alternatives

During construction, visual impacts would result from the introduction of construction vehicles, equipment, and construction materials within staging areas, access roads, and within the transmission line ROW. The presence of work crews, vehicles and other equipment, and dust generated by construction activities would be visible in views toward the Project Area from the surrounding area at varying distances depending on local conditions. Motion, dust, and activity would attract attention in certain circumstances. Where the Project would be in closer proximity to viewers and there is a lack of intervening topography or vegetation, ground disturbance from access routes and at structure bases could be visible to observers.

Disturbance resulting from construction would be temporary and largely short in duration, and visible effects from active construction would diminish subsequent to clean up and reclamation of the temporary staging areas and access roads. Reclamation of desert vegetation can take years to complete and conditions in areas of disturbance are expected to change over the years as reclamation takes place. Because of the small scale of vegetation disturbance required, there would be minimal visible contrasts that would be reduced over time.

Sensitive viewers would be affected by the temporary Project construction impacts. However, the transmission line structures would cause a major, long-term change to scenery, while construction of the structures and facilities would be short-term and temporary. Landform modification would be noticeable and create visual contrast within the viewshed.

Appendix 2A lists APMs and BMPs that would be applied to the Project to minimize visual impacts.

Simulations that were prepared and were not illustrative of specific impacts discussed in the following sections have been included in Appendix 3C, along with the associated visual contrast rating forms.

4.18.4.2 East Plains and Kofa Zone

Direct and Indirect Effects Common to All Segments in the Zone

The Project would be visible to some degree from many locations within the zone. The vast majority of sensitive viewers would be traveling along I-10; substantially fewer viewers would be traveling Salome Road, and fewer still would be traveling the relatively limited number of local routes. A large portion of the lands within the zone are BLM-administered land, but portions of the zone also contain large areas of private lands with isolated residences that could be impacted visually.

The majority of the BLM-administered land in the East Plains and Kofa Zone is rated scenic quality C. While any segment in the zone may reduce the scenic quality, overall, because the scenic quality in the units containing the segments in this zone is C, impacts to scenic quality would not further reduce the scenic quality rating of the units.

Direct and Indirect Segment-specific Effects

Segment-specific visual impacts and mitigation by KOP for all segments in the zone are presented in Table 4.18-1. Completed visual contrast rating forms for all KOPs are provided in Appendix 3C, which provide detailed analysis of visual impacts as determined from each KOP. Segment-specific discussions that follow are broken out by Proposed Action and Action Alternative, and are presented for:

- Those segments that would not conform to established VRM Classes,
- Those segments that would require mitigation or have mitigation from other resources that would affect visual resource impact analysis;
- Those segments for which BLM is considering an RMP amendment; or
- Those segments that would affect the views of private landowners (presented under a separate heading).

Table 4.18-1 Visual Impact Analysis and Mitigation Summary for the East Plains and Kofa Zone

KOP	KOP NAME	SEGMENTS VIEWED	SCENIC QUALITY	SENSITIVITY	VRI	VRM	CONFORM?	MITIGATION[1]	RMPA?[2]
1	Saddle Mountain Trailhead	p-01	N/A					None	No
		d-01	N/A					None	No
2	Salome Road South	p-01	N//A					None	No
		d-01	N/A					None. However, recommend matching monopoles from Delaney Substation across agricultural area – as viewed from KOPs 1 & 2 to reduce contrast between the structure types and sense of visual clutter (BMP-AES-10); however, the portions viewed by KOPs are not on BLM-administered land.*	No
3	I-10 Crossing East	p-01	N/A					None	No
4	Not Assigned								No
5	Private Residence	d-01	N/A					None	No
6	Salome Road North	p-01	N/A					None	No
7	Snowbird West RV Park	p-01	N/A					None	No

KOP	KOP NAME	SEGMENTS VIEWED	SCENIC QUALITY	SENSITIVITY	VRI	VRM	CONFORM?	MITIGATION[1]	RMPA?[2]
8	I-10 Crossing West	p-01, p-02	N/A					None. However, in the vicinity of the crossing, for Segment p-02, recommend using self-supporting lattice structures with matching color and span lengths to match the existing DPV1 structures to reduce contrast between the structure types and sense of visual clutter (BMP-AES-04); however, the portions viewed by KOPs are not on BLM-administered land.*	No
		p-03	C	Moderate	No	III	Yes	None	No
		i-01	C	Moderate	No	III	Yes*	None. However, recommend using self-supporting lattice structures with matching color and span lengths to match the existing DPV1 structures to reduce contrast between the structure types and sense of visual clutter (BMP-AES-04); however, the portions viewed by KOPs are not on BLM-administered land.*	No
		x-01	C	Moderate	No	II & III	Yes	None	No
		x-02b	C	Moderate	No	II & III	Yes	None	No

KOP	KOP NAME	SEGMENTS VIEWED	SCENIC QUALITY	SENSITIVITY	VRI	VRM	CONFORM?	MITIGATION[1]	RMPA?[2]
9	Eagletail Mountains (Courthouse Rock)	d-01	C	Moderate	No	III	Yes	None	No
10	Palomas – Harquahala Road	p-04, p-05	C	Moderate, High, and Low	II, III, IV	III	Yes	None	No
		x-03	C	Moderate & High	III & IV	III	Yes	None	No
11	Intersection of AT&T and Connector Road	i-02	C	Moderate	IV	III	Yes	None	No
		x-03	C	Moderate & High	III & IV	III	Yes	None	No
12	Hovatter Road	x-04	C	Moderate & Low	IV	III	Yes	None	No
13	Kofa Wayside/Vicksburg Road	p-06	C	Low	III, IV	III	Yes	None	No
14	Kofa #1	p-06	N/A					The USFWS has stated they will not issue a ROW through the Kofa NWR (Figure 4.18-6, Appendix 1); therefore, the need for any mitigation is moot.	No
15a	Kofa #2 – Wilbanks Road	p-06	N/A						No
15b	Kofa East Pinch Point	p-06	N/A						No
16	Kofa #3	p-06	N/A						No
17	I-10 Rest Area East	i-03	C & B	Moderate	III, IV	III	Yes	None	No
		x-04	C	Moderate and Low	IV	III	Yes	None	No
18	I-10 Westbound	i-03	C & B	Moderate	III, IV	III	Yes	None	No
		x-04	C	Moderate and Low	IV	III	Yes	None	No
19	Brenda RV Park	in-01	C & B	High	II, III	III	Yes	None	No

KOP	KOP NAME	SEGMENTS VIEWED	SCENIC QUALITY	SENSITIVITY	VRI	VRM	CONFORM?	MITIGATION[1]	RMPA?[2]
20	Gold Nugget Road	i-04	B & C	High	II, III	III	No	Recreation impact analysis determined that an unacceptable level of impacts to OHV rider safety could occur from guys extending from the guyed V structures in areas of heavy OHV use, and mitigation specifies that structures in these areas not contain guy wires. Structures along Segment i-04 would be replaced by either self-supporting lattice or monopoles (MM-REC-02), as specified by the BLM.	Yes
		in-01	B & C	High	II, III	III	No	Because of proximity of infrastructure to I-10 viewers and mountainous background, color treat the structures to better blend with the background. Minimize disturbance at bases (MM-VIS-01) and access-related disturbance.	Yes

KOP	KOP NAME	SEGMENTS VIEWED	SCENIC QUALITY	SENSITIVITY	VRI	VRM	CONFORM?	MITIGATION[1]	RMPA?[2]
59	I-10 West Crossing Eastbound	in-01	B & C - YFO	High - YFO	Unk	III	No	Disturbance at the bases of structures and along access routes should be minimized (MM-VIS-01). Newly disturbed rock areas should be surface treated to match surrounding rock to minimize color contrast (MM-VIS-03).	Yes
			Unknown – Lake Havasu	Unknown – Lake Havasu	IV	II & III	Yes		No
60	I-10 Eastbound On-ramp at Hovatter Road	i-01, i-02, i-03	C & B	Moderate	III & IV	III	Yes	None	No[3]
		x-03, i-03	C	Moderate & High	III, IV	II & III	Yes	None	No[3]
62	I-10 Westbound South of Brenda	Alt SCS	B	High	III	III	Yes	None	No
63	I-10 Eastbound South of Brenda	Alt SCS	B	High	III	III	Yes	None	No

N/A – Not Applicable; not located on BLM-administered land.

If more than one value applies to a segment, both values are provided showing the value with the highest proportion of the segment first.

[1]Structure changes would be required as mitigation for unacceptable impacts for other resources, with ramifications for visual resources impacts analysis.

[2]If yes, see Table 4.18-5, YFO RMP Amendment Summary by Segment, which contains descriptions of mitigative RMP amendments.

[3] An RMPA would be necessary if the existing corridor is not widened to include the portion of i-03 not in the corridor.

*Segment not located on BLM-administered land, therefore structure type to be determined by DCRT in conjunction with landowner; BLM recommendations only.

Proposed Action
All Proposed Action segments in the East Plains and Kofa Zone would conform to BLM VRM class objectives. The visual environment surrounding the intersection of Segments p-01, p-02, and i-01, all of which would be located on private and/or state trust lands, would benefit from changing the proposed guyed V structures (Appendix 1, Figures 4.18-7a and b) to self-supporting lattice to match the existing DPV1 transmission infrastructure, which would reduce contrast and visual clutter as viewed from KOPs 2, 3, 6, 7, and 8 (Appendix 1, Figures 3.18-7a and b, 3.18-8, 3.18-10, and 3.18-11). However, ultimately, the structure type would be determined by DCRT in conjunction with the landowner.

Alternative Segments
The only Alternative segments in the East Plains and Kofa Zone that would not conform to BLM VRM class objectives are Segment i-04, which is viewed from KOP 20 (simulated; Appendix 1, Figure 4.18-3a) and Segment in-01, viewed from KOPs 19, 20, and 59.

Segment i-04 would range in distance from viewers on I-10 from 0.1-mile to 0.4-mile. As described in Section 4.18.2.4, portions of Segment i-04 are used for OHV recreation during the heavy visitor use season, which would put recreationists in close proximity to the Project infrastructure. Because guyed V structures would pose an unacceptable human health and safety risk to OHV recreationists in heavily used recreation areas in this location, self-supporting lattice structures or monopoles would replace the guyed V structures as mitigation to eliminate the hazards associated with guy wires (Appendix 1, Figure 4.18-3b). However, regardless of structure type and application of additional MMs, taken together, this level of development would be a major modification to the visual environment and dominate the view. Thus, VRM Class III objectives would not be met. An amendment to the Yuma RMP to change the VRM class of Segment i-04 from Class III to Class IV would be required to achieve conformance (Appendix 1, Figure 4.18-8).

Segment in-01 (Appendix 1, Figure 3.18-24) would be on the north side of I-10 divided between the Yuma and Lake Havasu FOs. The portion of the route within the YFO would be within a BLM designated utility corridor and would be approximately 0.2-mile from viewers on I-10 at the closest point, and slightly less than 0.3-mile along the majority of that portion of the segment; all of which would be designated VRM Class III. Because the Project would be less than 0.3-mile from viewers along I-10, the infrastructure would be expected to outsize surrounding landforms, be a major modification and dominate view; therefore, an amendment of the Yuma RMP to change the VRM class from III to IV would ensure conformance (Appendix 1, Figure 4.18-8).

The portion of Segment in-01 within the Lake Havasu FO would be within a BLM utility corridor, crossing approximately 3 miles of lands designated VRM Class II and 5 miles of lands designated VRM Class IV. Segment in-01 within the Lake Havasu FO would be approximately 0.1-mile from viewers along I-10 at its closest point, but most portions would be approximately 0.2-mile away. The segment would meet VRM Class IV objectives; however, would not meet VRM Class II objectives given proximity to the Project in that area. Therefore, an amendment of the Lake Havasu RMP to change the VRM class from II to IV along this segment would ensure conformance.

Similar to the Proposed Action segment, the portion of Segment d-01 that would be located on private and/or state trust lands would benefit from changing the proposed guyed V structures to monopoles to match the existing monopole infrastructure from the Delaney Substation to the

Harquahala Power Plant (to the point where monopoles are proposed for this segment; Appendix 1, Figures 4.18-7a and b). This structure change would reduce contrast and visual clutter as viewed from KOP 2 (Appendix 1, Figures 3.18-7a and b). However, ultimately, the structure type would be determined by DCRT in conjunction with the landowner. No other segments in this zone would require mitigation.

Should some combination of Segments i-03, i-04, and/or x-04 be part of the selected alternative, the Alternative SCS location would be used. In this location, Segments i-03, i-04, and/or x-04 would be no closer than 0.3-mile from I-10. In views from KOP 62 (Appendix 1, Figure 4.18-9) and KOP 63 (Appendix 1, Figure 4.18-10), the SCS would be visible approximately 0.5-mile to the southwest and southeast, respectively, and would appear within the transmission corridor as a rectangular polygon aligned with segment structures. In addition, the alternate 12kV SCS distribution line would be visible crossing I-10 and extending south of the interstate to the Alternative SCS. Spans would typically be 300-350 feet and the Alternative SCS is approximately 1,600 feet south of I-10. Typical distribution line structures would be 45 feet in height, but taller on either side of I-10 at the crossing, where they may also utilize guy wires.

As a whole, the segments and Alternative SCS site would moderately contrast with the existing setting but would not be dominant in views. The Alternative SCS frame structures would appear shorter than adjacent transmission structures and, while visible above the desert floor, would not appear extending beyond a distant mountain skyline. The distribution line structures, while shorter than the Alternative SCS frame structures, would appear against an open backdrop at the I-10 crossing. The facilities within the Alternative SCS would appear in views as a relatively small cluster of transmission infrastructure; the transformers and banks would be visible amid the vegetative clusters surrounding the facilities. The distance between the interstate and Alternative SCS, in concert with intervening vegetation, would result in the Alternative SCS appearing partially absorbed into the landscape. Additionally, given interstate speeds, views of the Alternative SCS and its associated distribution line would be short in duration. While ground disturbance within the Alternative SCS site would be intermittently visible from I-10, if visible at all, disturbance should be minimized along access roads. No other mitigation would be required.

Residents and Local Viewers
Potential impacts to residents are represented by KOPs 5, 7, 19 (Appendix 1, Figures 3.18-9, -11, and 4.18-2, respectively). Potential impacts to travelers and other viewers on private lands are represented by KOPs 2 and 6 (Appendix 1, Figures 3.18-7a and b and 3.18-10, respectively), along Salome Road, and KOP 18 (simulated; Appendix 1, Figures 4.18-11a and b) near developments at the Vicksburg Road exit off I-10.

KOP 5 represents the views of a rural residence looking south toward Segment d-01 on private land approximately 2.8 miles away. From this KOP, the Project may be barely visible as a series of evenly spaced short, fine vertical lines of H-frame structures crossing agricultural lands to the south (Appendix 1, Figure 4.18-7a). While the Project would make a slight, and likely unnoticeable addition to the views from this KOP, other residences in the vicinity may be closer and have more noticeable views of the Project, but no residences are known to have major visual impacts.

KOP 7 is located outside an RV park looking south at Segment p-01 (Appendix 1, Figure 3.18-11), which would be paralleling the south side of the existing DPV1 transmission line. The existing infrastructure is distantly visible where skylined, and because of distance, the form of the existing structures is unclear. Despite the fact that the Project guyed V structures would differ in form from the existing DPV1 infrastructure, the form difference and associated contrast would not be noticeable from this distance. The addition of the Project would be a minor addition to the view, and if structures are aligned, marginally increasing the sense of development and visual clutter.

KOP 19 (simulated; Appendix 1, Figure 4.18-2) represents the views of residents of an RV park in Brenda, Arizona of Segment in-01 within the BLM utility corridor along I-10. As discussed in Section 4.18.2.4, the Project would be barely visible and not noticeable due to distance, topography, and intervening vegetation.

KOPs 2 and 6 (Appendix 1, Figures 3.18-7a and b and 3.18-10, respectively) represent the views of travelers on Salome Road, which would be expected to be mostly local traffic. Travelers familiar with the road would notice the addition of the Project infrastructure and the contrast created between the difference in form between the guyed V structures of the Project and the existing DPV1 self-supported lattice structures, particularly as they approach Segment d-01. Because the infrastructure would be in addition to the existing DPV1 infrastructure, the addition would be a moderate and noticeable impact to the visual resources; however, routine travelers of the road would become habituated to the change and it would be less noticeable over time.

KOP 18 represents the views from I-10 and developments near the Vicksburg Road exit off I-10 (simulated; Appendix 1, Figures 4.18-11a and 4.18-11b). The guyed V structures of the Project located approximately 1 mile from the KOP would be a minor to moderate impact to the visual resources of the area, most noticeable because of the evenly spaced guyed V structures seen into the distance. While the billboards and other vertical elements would help to blend the addition of the Project, it would still be a distinctive addition.

4.18.4.3 Quartzsite Zone

Direct and Indirect Effects Common to All Segments in the Zone

Because of the north-south linear nature of the Quartzsite Zone - nearly 11 miles - visibility of the Project would be limited within the zone to those segments within approximately 3 miles of the viewer, with the more distant segments becoming faded, camouflaged, or obscured by atmospheric conditions, and intervening topography and/or vegetation.

The majority of the visual impacts from the segments in the Quartzsite Zone would be to Federal lands managed by the BLM. However, four segments on BLM-administered land surround the community of Quartzsite and have potential to impact the views of private landowners.

Similar to the East Plains and Kofa Zone, the majority of the BLM-administered lands in the Quartzsite Zone are rated scenic quality C. While any segment in the zone may reduce the scenic quality, overall, because the scenic quality in the units containing the segments in this zone is C, impacts to scenic quality would not further reduce the scenic quality rating of the units. However, where the sensitivity of the East Plains and Kofa Zone is largely moderate, the sensitivity in the Quartzsite Zone is high, making any changes to scenic quality more noticeable to viewers in the area.

Direct and Indirect Segment-specific Effects

Segment-specific visual impacts and mitigation by KOP for all segments in the Zone are presented in Table 4.18-2. Completed visual contrast rating forms for all KOPs are provided in Appendix 3C, which provide detailed analysis of visual impacts as determined from each KOP.

Segment-specific discussions that follow broken out by Proposed Action and Action Alternative are presented for those segments that do not conform to established VRM Classes, require mitigation or have mitigation from other resources that would affect visual resource impact analysis; would require an RMP amendment; or would affect the views of private landowners.

Proposed Action Segments
Segments p-08 and p-09 would primarily be viewed in the Quartzsite Zone by travelers on SR 95; however, OHV recreationists on the access road paralleling the DPV1 transmission line or on any number of OHV routes east of SR 95 would also be viewing these segments. Views of these segments from SR 95 are represented by KOP 29 (Appendix 1, Figure 4.18-12a showing the proposed guyed V structures). Segments p-08 and p-09 would be readily viewed from KOP 29 directly east and west of and crossing SR 95. In addition to the DPV1 transmission line, at this intersection the WAPA 161kV H-frame structures, monopole structures of the distribution line providing power to the Cunningham Peak communications site, associated conductors, and pipeline infrastructure are visible, making the area look visually cluttered and developed. Because of the presence of the large self-supporting lattice structures of the DPV1 transmission line, the addition of the Project structures would be a relatively minor addition.

Because guyed V structures would pose an unacceptable human health and safety risk to OHV recreationists in heavily used recreation areas, such as the vicinity of the LTVA and Copper Bottom Pass, in this location, self-supporting lattice structures with matching color and span lengths to match the existing DPV1 structures would replace the guyed V structures as mitigation to eliminate the hazards associated with guy wires (Appendix 1, Figure 4.18-12b). However, regardless of structure type and application of additional MMs, taken together, this level of development would be a major modification to the visual environment and dominate the view. Thus, VRM Class III objectives would not be met.

An amendment to the Yuma RMP to change the VRM class of Segments p-07, p-08, and p-09 from Class III to Class IV would be required to achieve conformance. Consequently, amendment of the RMP to similarly change the VRM class of Segment p-06 west of the Kofa NWR would be implemented for management consistency in this area (Appendix 1, Figure 4.18-13).

Alternative Segments
Segment x-06 would be primarily viewed from within the LTVA; however, OHV recreationists on the access road paralleling the DPV1 transmission line or on any number of OHV routes east of SR 95 and the LTVA would also be viewing this segment. Views of this segment from within the LTVA are represented by KOPs 22 and 23 (simulated; Appendix 1, Figures 4.18-14a and 4.18-15a, respectively, showing the proposed guyed V structures). Views of the Project along Segment x-06 would be most impacted for those occupiers of the outer eastern edge of the LTVA, where the segment would be a few hundred feet away. During the heavy visitor use season, views would become more blocked and muted as viewers move into the central portion of the LTVA, where RVs would intervene in the view.

Table 4.18-2 Visual Impact Analysis and Mitigation Summary for the Quartzsite Zone

KOP	KOP NAME	SEGMENTS VIEWED	SCENIC QUALITY	SENSI-TIVITY	VRI	VRM	COMPLY?	MITIGATION[1]	RMPA?[2]
21	Mitchell Mine Road Residence	x-05	C & B	High	III	III & II	Yes	Recreation impact analysis determined that an unacceptable level of impacts to OHV rider safety could occur from guys extending from the guyed V structures in areas of heavy OHV use, and mitigation specifies that structures in these areas not contain guy wires. Structures along Segment x-05 would be replaced by either self-supporting lattice structures or monopoles, as specified by the BLM (MM-REC-02).	No
22	BLM Long Term Visitor Area (LTVA) #1	x-05	C & B	High	III	III & II	Yes	Same as above	No
		x-06	C & B	High	III	III, IV, & II	No	Recreation impact analysis determined that an unacceptable level of impacts to OHV rider safety could occur from guys extending from the guyed V structures in areas of heavy OHV use, and mitigation specifies that structures in these areas not contain guy wires. Structures along Segment x-06 would be replaced by either self-supporting lattice structures or monopoles, as specified by the BLM (MM-REC-02).	Yes
23	BLM LTVA #2	x-06	C & B	High	III	III, IV, & II	Yes	Same as above	No
		x-07	C	High	III	III	Yes	Not for this KOP; however, KOP 28 for Segment x-07 does not meet and recommends matching structures to reduce contrast (MM-VIS-06).	No

KOP	KOP NAME	SEGMENTS VIEWED	SCENIC QUALITY	SENSI-TIVITY	VRI	VRM	COMPLY?	MITIGATION[1]	RMPA?[2]
24	RV Park Quartzsite	qs-01	C	High	III	III	Yes	None. However, recommend matching monopole structures and surface treatment (BMP-AES-10).	Yes
25	Not Assigned								
26	Quartzsite Civic Event Parcel	qs-02	B & C	High	II & III	III & IV	Yes	Analysis of impacts to recreation found that guyed-V structures pose an unacceptable human health and safety risk to OHV recreationists in heavily used recreation areas. Self supporting lattice structures or monopoles would be used to eliminate guy wires (MM-REC-02).	Yes[3]
27	Boyer Road – Quartzsite North Side	qn-02	B & C	High	II & III	III & IV	Yes	Analysis of impacts to recreation found that guyed-V structures pose an unacceptable human health and safety risk to OHV recreationists in heavily used recreation areas. Self supporting lattice structures or monopoles would be used to eliminate guy wires (MM-REC-02).	Yes
28	SR 95 LTVA	x-07	C	High	III	III	No	Analysis of impacts to recreation found that guyed V structures pose an unacceptable human health and safety risk to OHV recreationists in heavily used recreation areas, such as the LTVA. Lattice H-frame structures would be used to eliminate guys and more closely match the WAPA 161kV H-frame structures, which would reduce structure contrast and visual clutter (MM-REC-02, MM-VIS-06).	Yes

KOP	KOP NAME	SEGMENTS VIEWED	SCENIC QUALITY	SENSI-TIVITY	VRI	VRM	COMPLY?	MITIGATION[1]	RMPA?[2]
29	SR 95 Crossing	p-07 and p-08	B & C	High	II & III	III	No	Analysis of impacts to recreation found that guyed V structures pose an unacceptable human health and safety risk to OHV recreationists in heavily used recreation areas. Self supporting lattice structures with matching color and span lengths to match the existing DPV1 structures would be used to reduce contrast between the structure types, sense of visual clutter, and eliminate guy wires (MM-REC-02, MM-VIS-06).	Yes
61	I-10 Eastbound West of Quartzsite	qs-02, i-06	B & C	High	II, III, & IV	III & IV	No	Analysis of impacts to recreation found that guyed-V structures pose an unacceptable human health and safety risk to OHV recreationists in heavily used recreation areas. Self supporting lattice structures or monopoles would be used to eliminate guy wires (MM-REC-02).	Yes
		qn-02/i-06	B & C	High	II & III	III & IV	No		Yes

N/A – Not Applicable; not located on BLM-administered land.

If more than one value applies to a segment, both values are provided showing the value with the highest proportion of the segment first.

[1]Structure changes would be required as mitigation for unacceptable impacts for other resources, with ramifications for visual resources impacts analysis.

[2]If yes, see Table 4.18-6, YFO RMP Amendment Summary by Segment, which contains descriptions of mitigative RMP amendments.

[3]An RMPA would be required to change to VRM Class IV the portion of Segment qs-02 west of the area of VRM Class IV and east of Segment i-06.

*Segment not located on BLM-administered land, therefore structure type to be determined by DCRT in conjunction with landowner; BLM recommendations only.

Segment x-07 would parallel the east side of SR 95 and the existing WAPA 161kV transmission line. This segment would be viewed either from the highway or from within the LTVA, as represented by KOPs 23 and 28 (simulated; Appendix 1, Figures 4.18-15b and 4.18-16, respectively). Similar to Segment x-06, views would become more blocked and muted as viewers move into the central portion of the LTVA, where RVs would intervene in the view.

The structures and conductors along these segments would pose a large, dominating presence that would be a major modification to the visual environment (Appendix 1, Figure 4.18-16).

Because guyed V structures would pose an unacceptable human health and safety risk to OHV recreationists in heavily used recreation areas, such as the vicinity of the LTVA and Copper Bottom Pass, along Segment x-06, either self-supporting lattice structures or monopoles would replace the guyed V structures (Appendix 1, Figures 4.18-14b and c) as mitigation to eliminate the hazards associated with guy wires (Appendix 1, Figures 4.18-17a and b). Along Segment x-07, lattice H-frame structures would replace the guyed V structures to more closely resemble the WAPA 161kV structures, as well as eliminate guy wires.

Regardless of structure type and application of any additional MMs, taken together, this level of development along Segments x-06 or x-07 would result in major modifications to the visual environment and dominate the view. Thus, VRM Class III objectives would not be met. An amendment to the Yuma RMP to change the VRM class of Segment x-06 from Class III to Class IV for 0.3-mile either side of segment centerline would be required to achieve conformance. An amendment to the Yuma RMP to change the VRM class of Segment x-07 from Class III to Class IV, where applicable.

Segment qs-01 (Appendix 1, Figure 3.18-35) would also be located in the northern portion of the LTVA east of SR 95 and south of I-10, in a heavily recreated area southeast of Quartzsite. Similar to Segments x-06 and x-07, proposed guyed V structures would be replaced with other structures to eliminate the hazards associated with guy wires. Because the structures would be replaced with a different type, it is recommended that in this location the guyed V structures be replaced with monopoles to more closely match the WAPA 161kV structures, which would also reduce contrast and visual clutter.

Segment i-06 (Appendix 1, Figure 3.18-40) would range between 0.1- and 0.2-mile from viewers traveling on I-10, in close proximity to the heavily recreated areas south of Quartzsite and Copper Bottom Pass. Similar to Segment i-04, proposed guyed V structures would be replaced with other structures to eliminate the hazards associated with guy wires. However, regardless of structure type and application of additional MMs, due to proximity of viewers, this level of development would be a major modification to the visual environment and dominate the view. Thus, VRM Class III objectives would not be met. An amendment to the Yuma RMP to change the VRM class of Segment i-06 from Class III to Class IV would be required to achieve conformance for the portion of the segment located on BLM-administered land.

Residents and Local Viewers
Segments qs-01 and qs-02, represented by KOPs 24 and 26 (Appendix 1, Figures 3.18-35 and simulated 4.18-18, respectively); and qn-02, represented by KOP 27 (Appendix 1, Figure 3.18-37), would be in relatively close proximity to the community of Quartzsite and would be visible from private lands.

Segment qs-01 would be on BLM-administered land approximately 0.25-mile away at its nearest point from the RV Park where KOP 24 is located. Because the Project along this segment would be less than 0.3-mile away from the viewer, the existing infrastructure begins to outsize the surrounding landscape features and dominate the view, and the Project would add to visual clutter. The Project along Segment qs-01 is proposed to use guyed V structures; however, those structures would be replaced with monopoles to eliminate potential hazards to OHV recreation from guy wires. This replacement would also reduce the contrast between the Project and the existing WAPA 161kV monopole structures. Addition of the Project along this segment with monopole structures would have a moderate to major impact to the views of RV park residents by increasing the sense of development and visual clutter.

Segment qs-02 would be on BLM-administered land approximately 0.75-mile away from the RV Park where KOP 26 is located. The Project along Segment qs-02 is proposed to use guyed V structures; however, those structures would be replaced with steel lattice structures or monopoles to eliminate potential hazards to OHV recreation from guy wires. This replacement would also reduce the visual clutter of the guy wires in the view. Addition of the Project along this segment with monopole structures would have a negligible to minor impact to the views of RV park residents as the vertical structures would blend well with the other single pole vertical elements in the view.

Segment qn-02 would be on BLM and Arizona state trust lands northeast, north, and northwest of Quartzsite. The nearest residence would be approximately 0.2-mile south of the segment, and the segment would be new development in an undeveloped area north and northwest of the residences. Northeast of the KOP, the segment would be paralleling the existing WAPA 161kV transmission line. As previously described, at distances less than approximately 0.3-mile from the Project, the Project is estimated to be outside the surrounding landscape features and dominate the view. Therefore, the Project along Segment qn-02 would have a moderate to major impact on views of private landowners in this area.

Southwest of Quartzsite is a residential development west of SR 95 that is accessed via Pipeline Road. At its nearest point, this development would be 2 miles from Segment x-07 and 2.5 miles from Segment qs-02. Addition of the Project along either Segment x-07 or qs-02 would be faintly visible but not noticeable in the distance, with the form indistinct and the conductors not distinguishable.

4.18.4.4 Copper Bottom Zone

Direct and Indirect Effects Common to All Segments in the Zone

Visibility of the Project within the Copper Bottom Zone would vary. A number of segments in this zone would be located in deep and narrow V-shaped canyons within the Dome Rock Mountains, limiting the extent of views, but placing viewers in close proximity to the segments. A number of segments or portions of segments would be located in open areas outside the Dome Rock Mountains, with more panoramic views and greater opportunity for long-distance visibility. However, this zone is heavily used for OHV recreation, with routes ranging from maintained gravel roads to two-track routes, to a technical OHV route through Johnson Canyon. The result is viewers in this zone would frequently be placed in close proximity to the segments, and in some cases, the Project would be viewed in conjunction with the existing DPV1 transmission line. For all segments that would be viewed in conjunction with the existing DPV1 transmission line, the surface of the structures would be dulled to match the existing infrastructure, if not treated to color blend with the mountainous backdrop, which could help reduce contrast.

The zone is almost exclusively Federal land managed predominantly by the BLM, but also managed by Reclamation. Further, a portion of this part of the Project Area includes CRIT tribal land. The visual effects would be felt by those traveling across or recreating on public lands, with little or no impacts expected to the views of private landowners.

The scenic quality in the Copper Bottom Zone is rated mostly B, and most of the areas in the zone have high sensitivity. Of the entire Project Area, Federal lands in the Copper Bottom Zone have the greatest potential for reductions in scenic quality of the unit(s) and noticeable impact to viewers of the zone, which is heavily used for recreation. Consequently, the VRI and VRM Classes in this zone tend to be the highest within the Project Area, meaning the area has the least tolerance for visual change without major impacts and is more sensitive to changes in VRM Class.

<u>Direct and Indirect Segment-specific Effects</u>

Segment-specific visual impacts and mitigation by KOP for all segments in the zone are presented in Table 4.18-3. Completed visual contrast rating forms for all KOPs are provided in Appendix 3C, which provide detailed analysis of visual impacts as determined from each KOP. Segment-specific discussions that follow broken out by Proposed Action and Action Alternative are presented for those segments that do not conform to established VRM Classes, require mitigation or have mitigation from other resources that would affect visual resource impact analysis; and/or would require an RMP amendment.

Proposed Action
The construction of Segments p-09, p-10, and p-11 would require helicopter fly yards, which would require crushing, mowing, or removal of vegetation and would disturb soil on 5.8, 20.0, and 7.6 acres, respectively. In the short term, these locations would cause a visual change to the landscape due to the movement of the helicopters and an increase in fugitive dust. In the long term, the disturbed soil and crushed or mowed vegetation would be noticeable on the landscape until fully recovered.

Table 4.18-3 Visual Impact Analysis and Mitigation Summary for the Copper Bottom Zone

KOP	KOP NAME	SEGMENTS VIEWED	SCENIC QUALITY	SENSI-TIVITY	VRI	VRM	COMPLY?	MITIGATION[1]	RMPA?[2]
30	Copper Bottom Pass Road #1	p-09, p-10	C & B	High	II, III	III	No	Analysis of impacts to recreation found that guyed V structures pose an unacceptable human health and safety risk to OHV recreationists in heavily used recreation areas. Self supporting lattice structures with matching color and span lengths to match the existing DPV1 structures would be used to reduce contrast between the structure types, sense of visual clutter, and eliminate guy wires (MM-REC-02, MM-VIS-06).	Yes
31	Not Assigned								
32	Copper Canyon	p-10	B	High	II	III	No	The surface of the structures should be dulled to match or be better than surface conditions of the DPV1 structures. Surface disturbance should be minimized; therefore, structure sites should be accessed via helicopter. Newly disturbed rock areas should be surface treated to match surrounding rock to minimize color contrast (MM-VIS-03).	Yes

KOP	KOP NAME	SEGMENTS VIEWED	SCENIC QUALITY	SENSI-TIVITY	VRI	VRM	COMPLY?	MITIGATION[1]	RMPA?[2]
33	Johnson Canyon	cb-02	B	High	II, III	II, III	No	Recommend no access routes be constructed to structure sites, and thus structure sites be accessed by foot or helicopter (MM-VIS-02). Recommend that disturbance at structure bases be minimized (MM-VIS-01). Consider applying surface treatments to newly exposed rock and gravel to blend with surrounding rock face and minimize visual impact of attention-attracting disturbance (MM-VIS-03). Recommend height of structures be limited to that absolutely necessary for safety and operation in order to minimize skylining (MM-VIS-04). Consider shortening span lengths and designing the route to follow the canyon route to minimize elements (conductors in particular) that would be overhead of viewers and skylined (MM-VIS-05). At a minimum, the surface of the structures should be dulled to eliminate potential for reflection, if not treated to color blend with the canyon, which could help reduce color contrast.	Yes

KOP	KOP NAME	SEGMENTS VIEWED	SCENIC QUALITY	SENSI-TIVITY	VRI	VRM	COMPLY?	MITIGATION[1]	RMPA?[2]
34	Copper Bottom Alternatives Intersection	cb-01/cb-04	B	High	II, III, IV	II & III	No	At a minimum, the surface of the structures should be dulled to eliminate potential for reflection, if not treated to color blend with the mountainous backdrop, which could help reduce contrast. Disturbance at the bases of structures and along access routes should be minimized (MM-VIS-01). Limit height of structures to that absolutely necessary for safety and operation in order to minimize skylining (MM-VIS-04). Shorten span lengths and design the route to follow canyon routes to minimize elements (conductors in particular) that would be overhead of viewers and skylined (MM-VIS-05).	Yes
		cb-02/cb-04	B	High and Moderate	II, III	II, III	No	At a minimum, the surface of the structures should be dulled to eliminate potential for reflection, if not treated to color blend with the mountainous backdrop, which could help reduce contrast. Disturbance at the bases of structures and along access routes should be minimized (MM-VIS-01). Limit height of structures to that absolutely necessary for safety and operation in order to minimize skylining (MM-VIS-04). Shorten span lengths and design the route to follow canyon routes to minimize elements (conductors in particular) that would be overhead of viewers and skylined (MM-VIS-05).	Yes

KOP	KOP NAME	SEGMENTS VIEWED	SCENIC QUALITY	SENSI-TIVITY	VRI	VRM	COMPLY?	MITIGATION[1]	RMPA?[2]
35	Copper Bottom Pass Road #2	p-11	B	High	II, III	III	No	The surface of the structures should be dulled to match or be better than surface conditions of the DPV1 structures. Surface disturbance should be minimized; therefore, structure sites should be accessed via helicopter (MM-VIS-02). Newly disturbed rock areas should be surface treated to match surrounding rock to minimize color contrast (MM-VIS-03).	Yes
		cb-03	N/A – CRIT Lands					None. However, similar to recommendations for BLM-administered land, on CRIT lands the surface of the structures should be dulled to match or be better than surface conditions of the DPV1 structures. Surface disturbance should be minimized; therefore, structure sites should be accessed via helicopter (BMP-AES-11). Newly disturbed rock areas should be surface treated to match surrounding rock to minimize color contrast (BMP-AES-12).*	N/A and Yes
36	Dome Rock Mountains	cb-04/cb-05	B	Moderate & High	II, III, IV	II & III	No	Analysis of impacts to recreation found that guyed V structures pose an unacceptable human health and safety risk to OHV recreationists in heavily used recreation areas. Self supporting lattice structures to match the existing DPV1 structures would be used in the vicinity of Segments cb-04 and 05 (MM-REC-02, MM-VIS-06).	Yes
		cb-04/06	B	Moderate & High	II, III, IV	II & III	No		Yes

KOP	KOP NAME	SEGMENTS VIEWED	SCENIC QUALITY	SENSI-TIVITY	VRI	VRM	COMPLY?	MITIGATION[1]	RMPA?[2]
37	Ehrenberg-Cibola Road	p-13	C	Moderate	IV	III	No	Analysis of impacts to recreation found that guyed V structures pose an unacceptable human health and safety risk to OHV recreationists in heavily used recreation areas. Self supporting lattice structures with matching color and span lengths to match the existing DPV1 structures to reduce contrast between the structure types, sense of visual clutter, and eliminate guy wires would be used.	Yes
		cb-05	B & C	Moderate	III, IV	II & III	No	Analysis of impacts to recreation found that guyed V structures pose an unacceptable human health and safety risk to OHV recreationists in heavily used recreation areas. Self-supporting lattice structures to match the existing DPV1 structures to reduce contrast between the structure types, sense of visual clutter, and eliminate guy wires would be used (MM-REC-02, MM-VIS-06).	Yes
38	Ehrenberg Wash	p-12	C & B	Moderate and High	II, III, IV	III	No	Analysis of impacts to recreation found that guyed V structures pose an unacceptable human health and safety risk to OHV recreationists in heavily used recreation areas. Recommend using self supporting lattice structures to match the existing DPV1 structures to reduce contrast between the structure types, sense of visual clutter, and eliminate guy wires would be used (MM-REC-02, MM-VIS-06).	Yes
		cb-06	C & B	Moderate	IV	III	No		Yes

KOP	KOP NAME	SEGMENTS VIEWED	SCENIC QUALITY	SENSI-TIVITY	VRI	VRM	COMPLY?	MITIGATION[1]	RMPA?[2]
39	I-10 Hilltop I-10 Rest Area West	i-06	N/A					None	N/A
40	I-10 Rest Area West	i-07	N/A					None	N/A

N/A – Not Applicable; not located on BLM-administered land.

If more than one value applies to a segment, both values are provided showing the value with the highest proportion of the segment first.

[1]Structure changes would be required as mitigation for unacceptable impacts for other resources, with ramifications for visual resources impacts analysis.

[2]If yes, see Table 4.18-5, YFO RMP Amendment Summary by Segment, which contains descriptions of mitigative RMP amendments.

*Segment not located on BLM-administered land, therefore structure type to be determined by DCRT in conjunction with landowner; BLM recommendations only.

Proposed Segments p-09, p-10, p-11, p-12, and p-13 within the Copper Bottom Zone, as viewed from KOPs 30, 32, 35, 37, and 38 (simulated; Appendix 1, Figures 4.18-5 , 4.18-19, 4.18-20, 4.18-21a and b; and 4.18-22a and b) would be within the BLM utility corridor designated VRM Class III. The existing DPV1 transmission line and the Proposed Action would follow Copper Bottom Pass Road, placing travelers on the road (primarily recreationists) within approximately 0.1- and 0.2-mile of the Project. Additionally, west of the Dome Rock Mountains, a variety of gravel roads, two tracks, and OHV trails wind around through the area, greatly varying distances between viewers and infrastructure. Along the Proposed Action, viewers would be observing the Project in the context of the DPV1 transmission line. As viewers move through the landscape, when the Project would be in closest proximity to the viewers, the structures would outsize the landscape features and portions would be skylined. Further, due to steeper than average slopes in Copper Bottom Pass, access roads (upgraded existing roads, new centerline access roads, or access spur roads) would range from 18 – 22 feet in width for relatively flat areas (0 – 7.9% slope), 25 – 30 feet in width for moderately sloped lands (8 – 14.9% slope), and 30 – 76 feet in width for steep lands (>15% slope). Areas allowing for vehicular turning radius would also be placed at intervals along Copper Bottom Pass Road. Such alterations would be visible in the views from KOP 32 and 35 (simulated; Appendix 1, Figure 4.18-20 and 4.18-21a and b, respectively), though current simulations do not reflect maximum potential width of the roads. As viewed in that situation, the Project, in conjunction with the DPV1 infrastructure, would be a major modification to the landscape and would dominate the view, thus not conforming to VRM Class III objectives.

DCRT proposes a combination of guyed V and self-supporting lattice structures for these Proposed segments (Appendix 1, Figure 4.18-23a). Because guyed V structures would pose an unacceptable human health and safety risk to OHV recreationists in heavily used recreation areas, such as the Copper Bottom Pass area, along these segments, self-supporting lattice structures would replace the guyed V structures as mitigation to eliminate the hazards associated with guy wires and also match the existing DPV1 structures, decreasing visual impacts (Appendix 1, Figure 4.18-23b, 4.18-19, and 4.18-5b). Additional mitigation for visual contrast would include dulling or color treating the structure surfaces to match or be better than surface conditions of the DPV1 structures. BLM would have the final approval to select the color to be applied to the structures. Surface disturbance should be minimized; therefore, structure sites should be accessed via helicopter. Newly disturbed rock areas should be surface treated to match surrounding rock to minimize color contrast.

While replacement of guyed V structures with structures roughly matching those of the DPV1 transmission line, and regardless of application of any additional MMs, taken together, this level of development along these segments does not meet VRM Class III objectives. An amendment to the Yuma RMP to change the VRM class of these segments from Class III to Class IV would be required to achieve conformance. The entirety of the BLM utility corridor along Segments p-09, p-12, and p-13 would be changed to VRM Class IV because of the open nature of these areas and thus any additional future development within the corridor would be viewed in context of both the Project and the DPV1 transmission line.

The VRM class in the BLM utility corridor containing Segments p-10 and p-11 would also be changed to Class IV; however, the extent of this change would be limited to the viewshed where both the Project and DPV1 would be visible (bounded by the adjacent ridgetops), while the rest of the utility corridor would remain VRM Class III (Appendix 1, Figure 4.18-24[4]).

Segment p-14 of the Proposed Action is not in an area heavily used for recreation (Appendix 1, Figure 4.18-23b). Thus, structure changes would not be required and the Project would be viewed more distantly than Segments p-09 through p-13. Viewer proximity for the majority of viewers would be at least 0.3-mile away, if not more. Therefore, this segment would continue to conform to VRM Class III standards and no RMP amendment or additional mitigation would be required.

Alternative Segments
The construction of Segments cb-01/cb-02 would require a helicopter fly yard, which would require crushing, mowing, or removal of vegetation and would disturb soil on 43.5 acres. In the short term, these locations would cause a visual change to the landscape due to the movement of the helicopters and an increase in fugitive dust. In the long term, the disturbed soil and crushed or mowed vegetation would be noticeable on the landscape until fully recovered.

Alternative Segments cb-01, cb-02, and cb-03 would all be located in narrow canyon settings with limited visibility. Of these Alternative segments, only the portion of Segment cb-03 on BLM-administered land would be located within the BLM utility corridor along the Proposed Action route and Copper Bottom Pass Road; however, it would be on the opposite side of the canyon from the DPV1 transmission line, as viewed from KOP 35 (simulated; Appendix 1, Figure 4.18-21b). Similar to the Proposed segments, travelers (recreationists) on the road would be in relatively close proximity to the Project along Segment cb-03 where the closest structures would outsize the surrounding landscape features and portions may be skylined. Despite the fact that the DPV1 infrastructure would be on the opposite side of the road, the Project would still be viewed in the context of the DPV1 transmission line, and taken together, would be a major modification to the landscape and would dominate the view, thus not conforming to VRM Class III objectives. Mitigation for the portion of this segment in the BLM utility corridor would include minimizing surface disturbance and color treating both disturbed rock surfaces and the structures to reduce contrast with the surrounding landscape. Under certain alternatives, the Yuma RMP would be amended to VRM Class IV with the extent of the change limited to the viewshed where both the Project and DPV1 would be visible (bounded by the adjacent ridgetops), while the rest of the utility corridor would remain VRM Class III (Appendix 1, Figure 4.18-24[5]). Mitigation measures similar to those described above for portions of Segment cb-03 located within the BLM utility corridor would also be recommended for the portion of Segment cb-03 located on CRIT lands; however, the CRIT would ultimately be responsible for determining required mitigation for portions of the segment on the reservation.

Portions of Segments cb-01 and cb-02 would be within the BLM utility corridor designated VRM Class III, where they would connect to the Proposed Action route. The portion of these segments

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[4] For purposes of this Technical Environmental Study, location of the VRM Class III/IV boundary as discussed here has been estimated. Should this segment be included in the selected alternative, the boundary would be precisely located using a viewshed analysis.
[5] For purposes of this Technical Environmental Study, location of the VRM Class III/IV boundary as discussed here has been estimated. Should this segment be included in the selected alternative, the boundary would be precisely located using a viewshed analysis.

outside of the utility corridor would be located exclusively within VRM Class II areas, as viewed from KOPs 33 and 34 (simulated; Appendix 1, Figure 4.18-25 and 4.18-26a and b). Segment cb-01 would cross the flank of Cunningham Peak to the west side of the Dome Rock Mountains and connect to Segment cb-04. Distant views contain Cunningham Peak and the communications site on its top; however, from areas outside of the Copper Bottom Pass area, the transmission infrastructure would either not be visible or minimally visible but indistinguishable, due to distance from viewers. Segment cb-02 would follow a portion of Johnson Canyon, then cross a ridge to connect to Segment cb-04.

As described for the Proposed segments, the closest structures to viewers along Segments cb-01 or cb-02 would outsize the landscape features and portions would be skylined. Because either of these segments would be a new addition in a heavily used, relatively scenic, and visually sensitive area, the Project would be a major modification to the landscape and would dominate the view, thus not conforming to VRM Class II objectives. To mitigate for visual impacts in these visually sensitive areas, no access would be constructed, surface disturbance would be minimized, and color treating for both disturbed rock surfaces and the structures to reduce contrast with the surrounding landscape would occur. Under certain alternatives, the Yuma RMP would be amended to VRM Class IV (both inside and outside the utility corridor) with the extent of the change limited to the viewshed where either segment would be visible (bounded by the adjacent ridgetops), while the rest of the utility corridor unaffected by the Project would remain VRM Class III.

Segment cb-04, as viewed from KOP 34 (simulated; Appendix 1, Figures 4.18-26a and 4.18-26b), would cross VRM Class II and III designated lands west of the Dome Rock Mountains, the eastern portion of which would have enclosed views of deep canyons connecting to Segments cb-01 or cb-02, then opening up to broader views of the west side of the Dome Rock Mountains and points west. The proposed structures for Segment cb-04 are guyed V structures, but because this is in the heavily recreated Copper Bottom Pass area, guyed V structures would be replaced with self-supporting lattice structures to eliminate potentially hazardous guy wires. Similar to Segments cb-01 and cb-02, the structures closest to viewers would outsize surrounding landscape features, a portion would be skylined, and the Project would be new development in a previously undeveloped area, and thus would not conform to VRM class objectives. The Yuma RMP would be amended to change the VRM to Class IV in an area 0.3-mile either side of the centerline of Segment cb-04.

Segments cb-05 and cb-06, as viewed from KOPs 36 and 38 (simulated; Appendix 1, Figures 4.18-27 and 4.18-22b, respectively) would offer alternative connections from Segment cb-04 to the Proposed Action route. On BLM-administered land, Segment cb-05 would cross VRM Class III designated lands while Segment cb-06 would cross lands primarily designated VRM Class II. Both segments would occur in areas with predominantly open panoramic views that are heavily used for OHV recreation, which would place viewers in close proximity to the infrastructure. Because of the heavy recreation use, proposed guyed V structures would be replaced with self-supporting lattice structures to eliminate potentially hazardous guy wires. These lattice structures would also reduce contrast with the existing DPV1 infrastructure, where viewed in conjunction with the Project. As described for the Proposed Action and other Alternative segments, these segments would not conform to VRM Class II and III objectives and the Yuma RMP would be amended to Class IV in an area 0.3-mile either side of the centerline of these segments.

4.18.4.5 Colorado River and California Zone

Direct and Indirect Effects Common to All Segments in the Zone

The Colorado River and California Zone contains all segments that could affect the resources of the Colorado River or within the state of California. Visually, segments approaching the Colorado River would be viewed in context of the river and the bluff where the river gives way to the floodplain. Those segments crossing the central portion of the zone would be viewed in the context of the cultivated river floodplain, with sporadic residential development. Generally speaking, the Project along segments in these areas would be visible for long distances but may be partially obscured or overwhelmed by other intervening visual features, such as trees. The western portion of the zone rises over a bluff above the floodplain to be on sandy, sparsely vegetated desert plain, where there the Project would be viewed in the context of numerous existing or proposed energy production or transmission facilities, including the Colorado River Substation.

Similar to the Copper Bottom Zone, the scenic quality of BLM-administered land in the Colorado River and California Zone is rated mostly B, and most of the areas in the zone have high sensitivity. However, the westernmost portion of the Project Area in the vicinity of the Colorado River Substation contains large utility corridors and areas slated for energy development, with numerous solar projects either under review or approved. Thus, the VRM class for this area is Class IV.

Direct and Indirect Segment-specific Effects

Segment-specific visual impacts and mitigation by KOP for all segments in the Zone are presented in Table 4.18-4. Completed visual contrast rating forms for all KOPs are provided in Appendix 3C, which provide detailed analysis of visual impacts as determined from each KOP. Segment-specific discussions that follow broken out by Proposed Action and Action Alternative are presented for those segments that do not conform to established VRM Classes, require mitigation or have mitigation from other resources that would affect visual resource impact analysis; would require an RMP amendment; or would affect the views of private landowners.

Proposed Action, Alternative Segments, Residents, and Local Viewers
All segments in the Colorado River and California Zone would conform to VRM class objectives no additional mitigation would be required.

Many segments would be visible at varying distances from sporadic residences scattered across the private lands in the central portion of the zone. KOPs 42, 47, 48, 49, 50, 51, 52, 53, and 54 would represent views of residents and community viewpoints of the Project along the segments in this Zone.

Table 4.18-4 Visual Impact Analysis and Mitigation Summary for the Colorado River and California Zone

KOP	KOP NAME	SEGMENTS VIEWED	SCENIC QUALITY	SENSI-TIVITY	VRI	VRM	COMPLY?	MITIGATION[1]	RMPA?[2]
41	Colorado River Crossing	i-08s/ca-04	N/A					None	N/A
42	Colorado River Corridor	ca-04/x-10	N/A					None	N/A
43	Riviera Drive, West Side of Colorado River	x-10, ca-01	N/A					None	N/A
44	Oxbow Road Colorado River Crossing	p-15e/w	NA					None	NA
		cb-10, x-11	N/A					None	N/A
45	McIntyre County Park	p-15e/w	N/A					None	N/A
46	Confidential – See Confidential Appendix 3D								
47	Appleby Elementary School	ca-05, ca-01	N/A					None	N/A
48	Miller Park	ca-05, ca-01	N/A					None	N/A
49	Intersection of Seeley and Lovekin	ca-05/ca-06	N/A					None	N/A
		p-15w	N/A					None	N/A
50	18th Avenue Houses	p-15w, ca-01, ca-05	N/A					None	N/A
51	Lovekin Private Residence	p-15w, ca-01	N/A					None	N/A
52	Intersection of I-10 and Neighbours Boulevard	ca-05, ca-06, ca-01, ca-02 p-15	N/A					None	N/A
		p-16	N/A					None	N/A
53	Ripley	p-15w, p-16, x-12, x-13	N/A					None	N/A
54	Mesa Verde Community	ca-07	B	High	II	IV	Yes		No

KOP	KOP NAME	SEGMENTS VIEWED	SCENIC QUALITY	SENSI-TIVITY	VRI	VRM	COMPLY?	MITIGATION[1]	RMPA?[2]
55	I-10 Communication Site	ca-09	B	High	II	IV	Yes		No
		p-17	B	High	II	IV	Yes		No
56	I-10 North of Colorado River Substation	ca-09	B	High	II	IV	Yes		No
		p-18	B	High	II	IV	Yes		No
57	Confidential – See Confidential Appendix 3D								
58	Not Assigned								

N/A – Not Applicable; not located on BLM-administered land.

If more than one value applies to a segment, both values are provided showing the value with the highest proportion of the segment first.

[1]Structure changes would be required as mitigation for unacceptable impacts for other resources, with ramifications for visual resources impacts analysis.

[2]If yes, see Table 4.18-5, YFO RMP Amendment Summary by Segment, which contains descriptions of mitigative RMP amendments.

*Segment not located on BLM-administered land, therefore structure type to be determined by DCRT in conjunction with landowner; BLM recommendations only.

KOP 42 (Appendix 1, Figure 3.18-54) represents the views of residents near Blythe on the western bank of the Colorado River, looking south at Segments ca-04 and x-10. The Project along these segments would be approximately 0.3-mile from the nearest residence at the closest point. The Project would be proportional to the surrounding landscape, thus would not dominate or be a major modification; however, because it would be a new development added to a view that contains very little development, it would be a moderate to major impact on the views of nearby residents.

KOP 45 (Appendix 1, Figure 3.18-57) represents the views of recreationists at McIntyre County Park, located along the west bank of the Colorado River, looking south at Segment p-15w, approximately 1.5 mile away. The existing DPV1 infrastructure is very small in the landscape, with structures that are of indistinct form and conductors that are barely perceptible. The Project would add structures of a different form generally aligned with the existing structures, but the form contrast would not be noticeable from this distance. The main impact to viewers from this KOP would be added visual clutter, which would be a negligible to minor impact.

KOP 47 (Appendix 1, Figure 3.18-58) represents the views of Blythe residents near Appleby Elementary School looking south at either Segment ca-05, approximately 1 mile away; or Segment ca-01, approximately 2.3 miles away. The existing DPV1 transmission line is over 4 miles away and is not visible; therefore, the Proposed Action segments would not be visible. Along Segment ca-05, structures would be visible and conductors would likely not be visible. Segment ca-01 may be distantly visible, depending on atmospheric conditions, but would not be noticeable. The infrastructure along both segments would blend with the intervening trees, and the trees would block the view of portions, if not most of Segment ca-05. The impact to viewers would be minor for Segment ca-05 and negligible for Segment ca-01.

KOP 48 (Appendix 1, Figure 3.18-59) represents the views of recreationists in the city park looking south at Segment ca-05, which would be over 1 mile away. The infrastructure along the segment would be distantly visible as regularly spaced structures with faintly visible conductors, portions of which are obscured by intervening development and vegetation. The infrastructure would be so small in the landscape that it would be difficult to distinguish and not noticeable. Because of distance, Segment ca-01 and the Proposed Action segments would not be visible. The impact to viewers would be negligible.

KOP 49 (Appendix 1, Figure 3.18-60) represents the views of dispersed residents along Seeley Avenue south of Blythe, looking south at Segments ca-05 and ca-06, approximately 0.3-mile away. The structures would be viewed in a rural agricultural setting. Because of the general lack of background mountainous topography, the structures would appear large, regularly spaced, with conductors that would be clearly visible. Along these segments, the Project would be a major new addition to the view that would be a moderate to major impact for local viewers.

KOP 50 (Appendix 1, Figures 3.18-61a and b) represents the views if dispersed residents in the vicinity of 18th Avenue looking north at Segment ca-05, approximately 0.8-mile away; or south at Segment ca-01, approximately 0.5-mile away. Looking either direction, the addition of the Project along these segments would be new, prominent infrastructure in a largely rural agricultural area, and similar to KOP 49, the view does not contain a backdrop of mountains to help absorb the addition. Depending on distance, the addition would be a moderate to major impact for local viewers.

KOPs 51 and 53 (Appendix 1, Figures 3.18-60a and b and 3.18-62) would represent residents viewing the Proposed Action along with the existing DPV1 infrastructure along Segment p-15w, approximately 0.5-mile away. The Project would use H-frame structures crossing agricultural areas, that, similar to the existing DPV1 infrastructure, would be regularly spaced and aligned with the existing infrastructure (to the extent possible). The structures would repeat the vertical and undulating horizontal elements in the existing view. Because the Project would not be a new addition to the landscape, rather adding to the sense of development and visual clutter, the impact to residents would be moderate.

KOP 52 (Appendix 1, Figure 3.18-63) represents the views of residents along Neighbours Boulevard west of Blythe, who would be looking south at Segments ca-07 and ca-09, approximately 1.3 miles away at the nearest point of the Project. Existing transmission infrastructure is faintly and distantly visible along the strong horizontal line in front of the hazy mountains. The Project would repeat the lines but be more prominently visible than the existing infrastructure and would be seen as a line of regularly spaced short vertical lines with conductors that may be visible, depending on lighting and atmospheric conditions. The infrastructure would grow in size and proportion to the surrounding landscape as distance between the viewer and the Project decrease. From the KOP, the Project would be a negligible to minor addition to the landscape but would likely reach a moderate to major level for closer viewers. Segments ca-01 and ca-02 would be approximately 2.5 miles south, and the Proposed segments approximately 4.5 miles south. Views of Segments ca-01 and ca-02 would have less effect from the KOP than Segments ca-07 and ca-09 and would place the moderate to major effects further south. The Proposed segments would not be detectable from the KOP.

KOP 54 (Appendix 1, Figure 3.18-65) would represent the views of residents of Nichols Warm Springs looking south at Segment ca-09, approximately 1 mile away. There are existing H-frame structures visible in the landscape approximately 0.5-mile way and the existing DPV1 infrastructure is not visible. The Project along Segment ca-09 would repeat the lines, if not the precise form, of the existing H-frame structures (Appendix 1, Figure 4.18-28), but they would appear smaller because they are further away. Because of the distance between the lines, the structures would not appear aligned, which would add to the sense of visual clutter. Taken in context with the existing visible infrastructure, the addition of the Project would have a minor to moderate visual impact to residents' views.

4.18.5 Operations, Maintenance, and Decommissioning

The structures, conductors, permanent access roads, and SCS, would increase visual contrast, mainly during the operational phase of the Project. Visual impacts would be most evident where cleared areas created scars, barren areas, or unnatural lines and contrast resulting from clearing which would remain for the life of the Project. The most evident and long-term visual contrasts result from the presence of structures and conductors within the landscape. These vertical structures, conductors, guy wires, and access roads would introduce long, linear disturbance that would contrast in areas where the Project would be relatively close to the KOP and in relatively natural areas where no development or existing infrastructure is visible or noticeable in the landscape. After decommissioning, these visual contrasts would no longer be present.

During maintenance, types of activities would be similar to but smaller in scope, and less noticeable than during construction (for example, structure or conductor maintenance or repair may require similar types or levels of effort to construction, but would occur in more discrete areas, requiring less equipment and/or disturbance that would be noticeable). During decommissioning, activities (types and levels of effort, and extent of disturbance) would be similar to construction, and likely equally noticeable.

Impacts to VRI were analyzed based on Scenic Quality Rating Unit (SQRU) scores (Appendix 4A). Most SQRU scores were solidly within the range such that any reductions in scenic quality that would result from the Project would not change the overall rating for the unit.

4.18.6 Mitigation Measures

The applicant has committed to APMs, and the BLM developed required BMPs, that would minimize impacts to visual resources (Appendix 2A, Section 2A.12). However, the following MMs would be required for VRM compliance and/or to reduce impacts to visual resources:

MM-VIS-01: Minimize disturbance at structure bases.

MM-VIS-02: No access routes would be constructed to structure sites, and thus structure sites be accessed by foot or helicopter.

MM-VIS-03: Apply surface treatments (such as Permeon, or an approved equal) to newly exposed rock and gravel to blend with surrounding rock face and minimize visual impact of attention-attracting disturbance.

MM-VIS-04: Limit height of structures to that absolutely necessary for safety and operation in order to minimize skylining and reduce the need for beacons to protect dark sky resources and maintain astronomical viewing opportunities.

MM-VIS-05: Shorten span lengths and design the route to follow canyon routes to minimize elements (conductors in particular) that would be overhead of viewers and skylined.

MM-VIS-06: Use structure type to match existing structures and reduce form contrast.

4.18.7 Resource Management Plan Amendments

RMP amendments to address issues with visual resources management would only be included for the Yuma and Lake Havasu RMP. The impact of these proposed RMP amendments would be to change the visual management standards for the design and management of future projects and for the rehabilitation of existing projects from the current VRM Class II or III to VRM Class IV, which allows for major modifications to the landscape.

4.18.7.1 Yuma Field Office

Table 4.18-5 summarizes visual resource related RMP amendments to the Yuma RMP.

Table 4.18-5 Summary of Visual Resource-related RMP Amendments to the Yuma RMP

SEGMENT	LENGTH	STATE AND COUNTY	PROJECT AREA ZONE	VRM CLASS	UTILITY CORRIDOR?	RMPA	RMPA ANALYSIS DRIVERS	VISUAL RMPA SUMMARY
PROPOSED ACTION SEGMENTS								
p-06	35.7	Arizona, La Paz	East Plains and Kofa	III	Yes - BLM Portion	Yes (only west of Kofa NWR)	VRM Class for p-06, p-07, and p-08 (KOP 29) should match for effective management of visual resources of lands west of the Kofa NWR. Travelers along the DPV1 access road would be experiencing the Project in conjunction with the. DPV1 transmission line within 0.1- to 0.25-mile, resulting in major modification and dominance	Change to VRM Class IV west of the Kofa NWR
p-07	2.1	Arizona, La Paz	Quartzsite	III	Yes	Yes		Change to VRM Class IV
p-08	0.6	Arizona, La Paz	Quartzsite	III	Yes	Yes		Change to VRM Class IV
p-09	6.9	Arizona, La Paz	Copper Bottom	III	Yes	Yes	Travelers along Copper Bottom Pass Road would be experiencing the Project in conjunction with the DPV1 transmission line within 0.1- to 0.25-mile (KOPs 30, 32, 35, 37, and 38), resulting in major modification and dominance.	Change to VRM Class IV
p-10	1.1	Arizona, La Paz	Copper Bottom	III	Yes	Yes		Change to VRM Class IV limited to the viewshed where both the Project and DPV1 would be visible (bounded by the adjacent ridgetops), while the rest of the utility corridor would remain VRM Class III.
p-11	4.1	Arizona, La Paz	Copper Bottom	III	Yes	Yes		Change to VRM Class IV
p-12	2.5	Arizona, La Paz	Copper Bottom	III	Yes	Yes		Change to VRM Class IV
p-13	3.5	Arizona, La Paz	Copper Bottom	III	Yes	Yes		Change to VRM Class IV
ALTERNATIVE SEGMENTS								
cb-01	3.2	Arizona, La Paz	Copper Bottom	II & III	Yes - Partial	Yes	Implementation of recommended MMs would not reduce contrast to the point that the segment would conform to VRM Class II and III standards (KOP 34).	Change to VRM Class III for conformance outside utility corridor within 0.3-mile either side of the centerline of segments, or in an area bounded by the viewshed where the segment would be within canyons.
cb-02	2.2	Arizona, La Paz	Copper Bottom	II & III	Yes - Partial	Yes	Implementation of recommended MMs would not reduce contrast to the point that the segment would conform to VRM Class II and III standards (KOP 33).	Change to VRM Class IV in conjunction with ROW within 0.3-mile either side of the centerline of segments, or in an area bounded by the viewshed where the segment would be within canyons, for conformance outside utility corridor; or expand existing utility corridor to contain this segment, and in conjunction with other corridor changes, change VRM to Class IV.
cb-03	4.3	Arizona, La Paz	Copper Bottom	III	Yes - Partial	Yes	Implementation of recommended MMs would not reduce contrast to the point that the segment would conform to VRM Class III standards (KOP 35).	Located partially on CRIT Reservation Change to VRM Class IV on portion on BLM-administered land within the utility corridor within the viewshed of the canyon.
cb-04	1.9	Arizona, La Paz	Copper Bottom	II & III	No	Yes	Implementation of recommended MMs would not reduce contrast to the point that the segment would conform to VRM Class III standards (KOP 34).	Change to VRM Class IV for the area within 0.3-mile either side of the centerline of the segment, or in an area bounded by the viewshed where the segment would be within canyons.

SEGMENT	LENGTH	STATE AND COUNTY	PROJECT AREA ZONE	VRM CLASS	UTILITY CORRIDOR?	RMPA	RMPA ANALYSIS DRIVERS	VISUAL RMPA SUMMARY
cb-05	4.4	Arizona, La Paz	Copper Bottom	II & III	Yes - Partial	Yes	Implementation of recommended MMs would not reduce contrast to the point that the segment would conform to VRM Class III standards (KOP 36).	Change to VRM Class IV for the area within 0.3-mile either side of the centerline of the segment.
cb-06	1.9	Arizona, La Paz	Copper Bottom	III	Yes - Partial	Yes	Implementation of recommended MMs would not reduce contrast to the point that the segment would conform to VRM Class II and III standards (KOP 36).	Change to VRM Class IV for the area within 0.3-mile either side of the centerline of the segment.
i-03	19.9	Arizona, La Paz	East Plains and Kofa	III	Yes - partial	Optional for ROW	Viewers at the KOP would be 0.4-mile from the closest point along the segment (KOPs 17 & 60). Viewers in closer proximity to the segment would be few if any, as access near/along the segment is extremely limited. An RMPA would be necessary if the existing corridor is not widened to include the portion of i-03 not in the corridor.	None
i-04	10.5	Arizona, La Paz	East Plains and Kofa	III	Yes	Yes	VRM Class III objectives would not be met because viewers would only be 0.1-mile away from the Project in certain areas (KOP 20), MMs would not reduce impacts to allow for conformance, resulting in major modification and dominance.	Change the VRM to Class IV within the BLM utility corridor.
i-05	2.8	Arizona, La Paz	East Plains and Kofa	III	Yes	Yes	Viewers along I-10 would be 0.3-mile from the closest point along the segment. Viewers in closer proximity to the segment would be few, as access near/along the segment is limited. However, Segment i-05 would be changed to Class IV to conform.	Change the VRM to Class IV within the BLM utility corridor.
i-06	7.2	Arizona, La Paz	Copper Bottom	III	Yes	Yes	Viewers along I-10 would be 0.2-mile from the closest point along the segment (KOP 61).	Change the VRM to Class IV within the BLM utility corridor.
qn-02	10.8	Arizona, La Paz	Quartzsite	III & IV	Yes - partial	ROW	Viewers at KOP 27 would be 0.3-mile from the closest point of BLM-administered land along the segment. Viewers in closer proximity to the segment would be few if any, as access near/along the segment is limited.	Change to VRM Class IV 0.3-mile either side of centerline within a single-use ROW
qs-01	3.1	Arizona, La Paz	Quartzsite	III	Yes - partial	Yes	Viewers at KOP 24 would be approximately 0.2-mile from the closest point of the segment, with structures expected out outsize nearby landforms and dominate the view.	Change to VRM Class IV 0.3-mile either side of centerline within a ROW

SEGMENT	LENGTH	STATE AND COUNTY	PROJECT AREA ZONE	VRM CLASS	UTILITY CORRIDOR?	RMPA	RMPA ANALYSIS DRIVERS	VISUAL RMPA SUMMARY
qs-02	4.8	Arizona, La Paz	Quartzsite	III & IV	Yes - partial	Yes	Viewers of Segment qs-02 would be viewing the Project in the context of other development and vertical elements that the Project would blend with.	Change to VRM Class IV within the BLM utility corridor.
x-06	9.2	Arizona, La Paz	Quartzsite	III, IV, II	Yes - partial	Yes	Viewers from KOP 22 would be about 700 feet from the segment, where the Project would be viewed as a major modification and dominating; MMs would not allow conformance and VRM Class III objectives would not be met.	Change to VRM Class IV 0.3-mile either side of segment centerline. Class II portions not visible from KOP 22 or 28.
x-07	7.7	Arizona, La Paz	Quartzsite	III	Yes	Yes	Implementation of MMs would not reduce contrast to the point that the segment would conform to VRM Class III standards.	Change to VRM Class IV within the BLM utility corridor.

N/A – Not Applicable; not located on BLM-administered land.

*Structure changes would be required as mitigation for unacceptable impacts for other resources, with ramifications for visual resources impacts analysis.

**Segment not located on BLM-administered land, therefore structure type to be determined by DCRT in conjunction with landowner; BLM recommendations only.

4.18.7.2 Lake Havasu Field Office

Table 4.18-6 summarizes visual resource related RMP amendments to the Lake Havasu RMP.

Table 4.18-6 Summary of Visual Resource-related RMP Amendments to the Lake Havasu RMP

SEGMENT	LENGTH	STATE AND COUNTY	PROJECT AREA ZONE	VRM CLASS	UTILITY CORRIDOR?	RMPA	RMPA ANALYSIS DRIVERS	VISUAL RMPA SUMMARY
ALTERNATIVE SEGMENTS								
in-01	13.9	Arizona, La Paz	East Plains and Kofa	II & III	Yes	Yes	Viewers of the segment would range in distance of 0.4-mile to 1.3 miles from the closest point along the segment (KOPs 19 and 20). Viewers in closer proximity to the segment would be few if any, as access near/along the segment is extremely limited.	Within the BLM utility corridor, change the VRM from Class II to Class IV in the Lake Havasu RMP; change the VRM class from III to IV in the Yuma FO.

4.18.8 Construction of Full Route Alternatives and Subalternative Effects

4.18.8.1 Proposed Action

Linear KOPs

The Proposed Action would impact the linear KOP along I-10 in the eastern portion of the Project Area approaching and between the two I-10 crossings of Segment p-01 (Appendix 1, Figure 3.18-12). Scenic quality in this area is rated B, except for a very small area near the easternmost crossing; and sensitivity is moderate. At the crossings, the infrastructure would appear as a major modification and dominate views within approximately 0.3-mile either side of each crossing, and north and south of each crossing location. However, travelers on I-10 at 75 mph would only be viewing each crossing in close proximity for a few seconds. The crossings would be within the ADOT easement for I-10 and on a combination of Arizona state trust and private lands either side of the easement. The BLM recommends structure changes in these locations to reduce contrast and the sense of visual clutter; however, ultimately, the type of structures used would be determined between DCRT and the landowner.

4.18.8.2 Alternative 1: I-10 Route

Linear KOPs

Along the I-10 linear KOP, scenic quality on Federal lands is mostly B with notable exceptions of the Big Horn Mountains Wilderness. The New Water Mountains, the Dome Rock Mountains, and in the general vicinity of the Colorado River Substation, which are A. Visual sensitivity along I-10 is almost evenly divided between moderate and high, with areas of high sensitivity being in the general vicinity of Quartzsite and west of Blythe in the vicinity of the Colorado River Substation. Impacts to viewers along I-10 are going to be minor in areas of lower scenic quality and sensitivity and moderate in areas of higher scenic quality and sensitivity. Additionally, there are larger areas of higher scenic quality south of I-10 than there are to the north, meaning that viewers along I-10 attracted to the distant scenic views to the south would be viewing these areas with the Project in the intervening landscape. In areas of moderate impact, the visibility of distant scenic quality A areas may further increase the adverse visual impact of the Project, notably Segment i-04.

From the western crossing of I-10 by Segment p-01 (Appendix 1, Figure 3.18-12), Alternative 1 would continue west, paralleling the south side of I-10. With exception of Segment p-01, most of the segments along the I-10 route would involve adding new transmission infrastructure in areas where there is no existing infrastructure. Many of these areas are open lands with minimal or no perceived development. Addition of the transmission line along these routes would add a visible and, in many cases, noticeable development. However, most of the areas crossing BLM-administered land would meet established VRM class objectives. For the majority of the route, the Project would be 0.3-mile or more away from viewers traveling along I-10, which at its nearest points would place the Project within the context of the surrounding landscape. Under Alternative 1, the Alternative SCS location would be used, connected by Segments i-03 and i-04; however, as described in Section 4.18.4.2, the Alternative SCS would meet VRM Class III objectives as viewed by travelers along I-10. In addition, the alternate 12kV SCS distribution line would be visible crossing I-10 and extending south of the interstate to the Alternative SCS.

Views along I-10 crossing the CRIT Reservation lands would be similarly impacted. East of the Colorado River, the Project infrastructure along I-10 would generally range between 0.3- and 0.7-mile away from viewers on I-10, with exception of a few segments; therefore, the relative size of the infrastructure in the landscape would minimally fluctuate (Appendix 1, Figure 4.18-29 and Figure 4.18-30) as travelers move along the highway. Near the Colorado River, the I-10 route would diverge from I-10 to the south, placing the Project 0.5-mile to 1.5 miles south of the Interstate, further reducing the visibility and visual effects of the Project on I-10 travelers. With greater distance, the infrastructure would be better absorbed by the surrounding landscape and less noticeable. Intervening vegetation or other development may occasionally block or blend the Project views (Appendix 1, Figure 4.18-11a and b).

Subalternatives to Alternative 1 (1A through 1E)

Subalternative 1A
Subalternative 1A would replace Segment i-01 with Segments p-02, p-03, x-02a and x-02b, further removing the Project from proximity to I-10 viewers and reducing visual impacts along this portion of the I-10 linear KOP.

Subalternative 1B
Subalternative 1B would replace Segment i-01 with Segments p-02, x-01, and x-02a, further removing the Project from proximity to I-10 viewers and reducing visual impacts along this portion of the I-10 linear KOP.

Subalternative 1C
Subalternative 1C would replace Segments i-04 and i-05 with Segment in-01. Segment in-01 (Appendix 1, Figure 3.18-25a) would cross from the south to the north side of I-10, then parallel the north side of I-10 for almost 14 miles. Approximately 3 miles of Segment in-01 would cross VRM Class II lands and 5 miles of VRM Class IV lands in the Lake Havasu Field Office; whereas Segments i-04 and i-05 would cross 13.8 miles of VRM Class III lands in the YFO.

As previously described for Alternative 1, the area along Segment i-04 is rated scenic quality A and has high sensitivity. In conjunction, viewers are attracted to distant views of the New Water Mountains Wilderness to the south. Subalternative 1C would move the transmission line to the north side of I-10 such that I-10 viewers in this area of high sensitivity would not be viewing the distant high-quality scenery with the Project in the immediate foreground, reducing visual impacts in this portion of the I-10 linear KOP. Segment in-01 would be approximately the same distance north of I-10 as south, thus the immediate foreground impact to views of the Project by I-10 travelers would be the same as Alternative 1. Additionally, use of Segment in-01 would move the Project out of a heavily recreated area where structure change would be required to eliminate potential hazards from guy wires, and use of guyed V structures north of I-10 would not create a potentially hazardous situation.

However, Subalternative 1C would add two crossings of I-10, which would increase visual impacts in those specific locations. Notably, travelers on I-10 are traveling at a minimum of 75 mph, thus the impacts of additional crossings would be brief.

Subalternative 1D
Subalternative 1D would consist of Segment qn-01, which connects routes on the north and south side of I-10, and would be used in conjunction with other subalternatives. Segment qn-01 would be changed from VRM Class III to IV.

The subalternative would be located in conjunction with the WAPA 161kV transmission line crossing I-10. Structures would be matched to the existing to eliminate form contrast and minimize visual clutter. At highway speeds, impacts to I-10 travelers would be minor.

Subalternative 1E
Subalternative 1E would replace Segment ca-05 with Segments x-10, ca-01, and x-12, moving the Project disturbance approximately 1.25 miles further south of I-10 and reducing the visual impacts to this portion of the linear KOP.

4.18.8.3 Alternative 2: BLM Utility Corridor Route

Linear KOPs

The I-10 linear KOP encompassing Segments i-01 through i-05 would be the same as described for Alternative 1 in Section 4.18.7.2.

Segment x-07 would impact the linear KOP along SR 95 south of Quartzsite. The views of travelers on SR 95 currently include the WAPA 161kV transmission line, including H-frame structures on the east side of the highway, and single-pole distribution lines on the west side of the highway. The Project would add lattice H-frame structures east of and parallel to the existing WAPA 161kV infrastructure within the BLM utility corridor, that would remain a relatively consistent distance from SR 95 viewers traveling at highway speeds. The segment would connect to Segment p-09, convert to self-supporting lattice structures, and turn west to follow Copper Bottom Pass Road, crossing over SR 95. The large lattice H-frame structures would be a major modification and would dominate the views for travelers on SR 95, particularly in conjunction with the existing utility infrastructure.

Subalternatives to Alternative 2 (2A through 2E)

Subalternative 2A
Subalternative 2A would replace Segments p-01 and i-01 with Segments d-01, x-02a, and x-02b, moving the location of the Project south away from I-10, which would reduce the visual impacts to this portion of the I-10 linear KOP.

Subalternative 2B
Subalternative 2B would replace Segments i-01 and i-02 with Segments p-02 through p-04 and Segment x-03, moving the location of the Project south away from I-10, which would reduce the visual impacts to this portion of the I-10 linear KOP.

Subalternatives 2C and 2D
Subalternatives 2C and 2D would have no effect on visual resource impacts as viewed within the I-10 linear corridor.

Subalternative 2E
Subalternative 2E would replace Segments p-16 and x-16 with Segments x-13 and ca-02, moving the location of the Project north, roughly mid-way between the Proposed Action route and I-10. This subalternative would place the Project in an area of private agricultural lands, with no nearby KOPs; it would be distantly viewed from KOP 52. Use of Segment x-13 instead of x-16 would move that portion of the Project from BLM-administered land to private lands; however, because of the predominate agricultural use, limited sensitive viewers, there would be no discernable change in visual impacts.

4.18.8.4 Alternative 3: Avoidance Route

Under Alternative 3, the I-10 linear KOP in the eastern portion of the Project Area would be impacted as described under the Proposed Action. Segment x-03 would connect the Proposed Action route from Segment p-04 up to the I-10 route at Segment i-03, continuing through Segment i-04, where impacts to the linear KOP would be as described under Alternative 2. Alternative 3 would diverge from the I-10 linear KOP at Segment x-05, which would also avoid any impacts to the SR 95 linear KOP. The Alternative 3 route would not be visible from I-10 until Segments ca-06, ca-07, and ca-09, where the Project would be approximately 1.5 miles south of I-10 for approximately 8 miles before turning south along Segment x-19 to connect to the Colorado River Substation. Impacts to this portion of the I-10 linear KOP would be as described under Alternative 2.

Subalternatives to Alternative 3 (3A through 3M)

Subalternative 3A
Subalternative 3A would replace Segments p-01 and i-01 with Segments d-01, x-02a and b, and i-02. While the Alternative 3 route would have a minor effect on visual resources within the linear KOP along I-10, Subalternative 3A would move the Project further south, lessening the effect on visual resources as viewed from I-10.

Subalternative 3B
Replacement of Segments p-02 through p-04 and x-03 with Segments i-01 and i-02 would have the same impact to this portion of the I-10 linear KOP as described for Alternative 1.

Subalternative 3C
Subalternative 3C would replace Segments x-03 and i-03 with Segments x-04 and p-05, which would shift the Project up to nearly 5 miles south of I-10 at its most distant point, virtually eliminating visual impacts at that point. Segment x-04 would diagonal northwest to meet the I-10 route at Segment at Segment i-04, and visual impacts along I-10 would slowly increase with decreased distance between the Project and I-10.

Subalternative 3D
Impacts from Subalternative 3D would be the same as those described for Subalternative 1C.

Subalternative 3E
Under Subalternative 3E, Segments qs-01 and x-07 would replace Segment x-06. Placement of the Project along Segment qs-01 immediately southeast of Quartzsite would have minor impacts to the views of I-10 travelers who would see the Project paralleling the WAPA 161kV transmission line; however, impacts to nearby residents would be moderate to major.

Subalternative 3F
Under Subalternative 3F, Segment x-06 would replace Segment x-05, resulting in Segment i-05 being required in conjunction with Segment x-06, placing the Project in closer proximity to I-10 for that distance, with impacts as described under Alternative 1.

Subalternative 3G
Subalternative 3G would use Segment qn-01 in conjunction with other segments, with impacts as described for Subalternative 1D.

Subalternative 3H
Subalternative 3H would use Segment qn-02 in conjunction with Segment i-06, at a minimum. While Segment qn-01 would have impacts to visual resources of I-10 travelers similar to Alternative 3, the addition of other segments along I-10 west of Quartzsite would increase the visual impacts, as compared to Alternative 3.

Subalternative 3J
Subalternative 3J would use Segment i-05 in conjunction with other segments. See analysis of Subalternative 3F.

Subalternative 3K
Subalternative 3K would have no effect on visual resource impacts as viewed within the I-10 linear corridor.

Subalternative 3L
Subalternative 3L would include the use of Segment i-06, which would move the Project along I-10 for this segment; see analysis of impacts from this segment under Alternative 1.

Subalternative 3M
Subalternative 3M would have no effect on visual resource impacts as viewed within the I-10 linear corridor.

4.18.8.5 Alternative 4: Public Lands Emphasis Route

The Alternative 4 route would remain south and not impact the visual resources along the I-10 linear KOP until Segment i-04. Under Alternative 4, the Alternative SCS location would be used, connected by Segments x-04 and i-04; however, as described in Section 4.18.4.2, the Alternative SCS would meet VRM Class III objectives as viewed by travelers along I-10. Other impacts were previously described as follows:

- Segment in-01 – Subalternative 1C
- Segments ca-06, ca-07, ca-09, x-19 – Alternative 3.

All other segments would not impact views along the I-10 linear KOP.

<u>Subalternatives to Alternative 4 (4A through 4P)</u>

Subalternative 4A
Subalternative 4A would have no effect on visual resource impacts as viewed within the I-10 linear corridor.

Subalternative 4B
Subalternative 4B would replace Segments p-05 and x-04 with Segments x-03 and i-03, which would place the Project in closer proximity to the I-10 liner KOP with impacts as described for Alternative 2.

Subalternative 4C
Subalternative 4C would use Segment i-04 with impacts to the I-10 linear KOP as described for Subalternative 3C.

Subalternative 4D
Subalternative 4D would replace Segments i-05 and x-06 with segments x-05 and p-07, with impacts to visual resources along the I-10 and SR 95 linear KOPs as described for Subalternative 3F and the Proposed Action.

Subalternatives 4E, 4F, and 4G
Subalternatives 4E, 4F, and 4G would have no effect on visual resource impacts as viewed within the I-10 linear corridor.

Subalternative 4H
Subalternative 4H would use Segments x-08 and i-07. Segment i-07 would place the Project in the BLM utility corridor along I-10 in a narrow canyon area west of the Dome Rock Mountains that opens up to broad, panoramic views. As viewed from Segment i-07 (simulated; Appendix 1, Figure 4.18-30) would be approximately 0.3-mile away from viewers and would impact visual resources similar to impacts in the eastern portion of the Project Area; however, Segment i-07 would be on Reclamation-managed public lands.

Subalternative 4J
Subalternative 4J would use Segment i-05 with the same impacts to visual resources along the I-10 linear KOP as described for Subalternative 3J.

Subalternatives 4K, 4L, 4M, 4N, and 4P
Subalternatives 4K, 4L, 4M, 4N, and 4P would have no effect on visual resource impacts as viewed within the I-10 linear corridor.

4.18.8.6 Mitigation Summary

Table 4.18-7 summarizes the mitigation required for Alternatives and Subalternatives.

Table 4.18-7 Mitigation Summary for Alternatives and Subalternatives

ALT/SUBALT	VIS-01	VIS -02	VIS-03	VIS -04	VIS-05	VIS-06
Proposed Action	X	X	X	X		X
Alternative 1	X		X			X
Subalternative 1A						X[1]
Subalternative 1B						X[1]
Subalternative 1C	X					
Subalternative 1D						X
Subalternative 1E						
Alternative 2	X		X	X		X
Subalternative 2A						X[1]
Subalternative 2B						X[1]
Subalternative 2C	X	X	X	X	X	
Subalternative 2D	X	X	X	X		
Subalternative 2E						
Alternative 3	X	X	X	X		X[1]
Subalternative 3A						X[1]
Subalternative 3B						
Subalternative 3C						
Subalternative 3D	X		X			
Subalternative 3E	X					X

ALT/SUBALT	VIS-01	VIS -02	VIS-03	VIS -04	VIS-05	VIS-06
Subalternative 3F	X					
Subalternative 3G						
Subalternative 3H	X					X[2]
Subalternative 3J						
Subalternative 3K	X	X	X	X	X	
Subalternative 3L	X		X			X
Subalternative 3M						
Alternative 4	X	X	X	X	X	X[1]
Subalternative 4A						
Subalternative 4B						
Subalternative 4C						
Subalternative 4D	X					X
Subalternative 4E	X	X	X	X	X	
Subalternative 4F						
Subalternative 4G	X	X	X	X	X	
Subalternative 4H						
Subalternative 4J						
Subalternative 4K						
Subalternative 4L						
Subalternative 4M						
Subalternative 4N						
Subalternative 4P						

[1]Any structure changes on non-BLM lands would be negotiated between the DCRT and landowner.

[2]Partial, mitigation measure only applies to a portion of the full route.

4.18.9 Residual Impacts

After the application of mitigation, non-conforming segments would continue to not conform to established VRM class objectives. Even where structure changes are required to address potential recreation hazards from guy wires, and where structures are changed to match any existing structures, segments would continue to be a major modification on the landscape and dominate views. However, implementation of mitigation would reduce the contrasts and overall impacts, even if the VRM class objectives could not be met.

4.18.10 CDCA Plan Compliance

CMAs LUPA-VRM-1, LUPA-VRM-2, DFA-VRM-1, and DFA-VPL-VRM-1 would apply to the Project (Appendix 2C) and would be satisfied by information provided in Section 4.18. DFA-VPL-VRM-3, LUPA-TRANS-BIO-1, LUPA TRANS-BIO-3, LUPA TRANS-BIO-4would also apply to the Project (Appendix 2C). The Project would comply with these CMAs through APM-AES-04 through APM-AES-06, and BMP-AES-04 and BMP-AES-06 through BMP-AES-08 (Appendix 2A).

4.18.11 Unavoidable Adverse Effects

The Project would be visible in the landscape when within approximately 3 miles of viewers; and noticeable between 1 and 2 miles away, particularly where there is no existing development. Where the Project would follow the existing DPV1 transmission line, the Project, in combination with the existing infrastructure would result in increased visual clutter and would result in contrast in structure form when guyed V structures would be used adjacent to the existing self-supporting lattice structures of the DPV1 transmission line. Where visible, ground disturbance would be obvious and noticeable for many years, if not permanently because of the desert environment and difficulty with revegetation and reclamation.

4.18.12 Cumulative Effects

The Project in conjunction with past, present, and reasonably foreseeable future projects would incrementally contribute to changes in the visual character and the scenic quality of the natural landscapes in the CEA.

To the extent that construction of the Project would be visible within the same field of view as one or more of the existing projects, those under construction, or reasonably foreseeable future projects, adverse cumulative visual impacts could result. The Project and the past, present, and reasonably foreseeable future projects combined would result in a perceived increase in industrialization of the landscape, diminution of visual quality, and increase in visual contrast. Also, in the cases where there appear to be multiple corridors due to greater separation between facilities, the projects would contribute to a sense of proliferation of energy infrastructure within the I-10 corridor.

The Project, in combination with the existing infrastructure of the DPV1 transmission line would result in increased visual clutter, and contrast in structure form when guyed V structures would be used adjacent to the existing self-supporting lattice structures of the DPV1 transmission line. Within the BLM utility corridor along I-10, the combination of the highway and transmission infrastructure would increase the sense of development within the corridor as viewed by travelers along I-10. Tables 3.20-5 and 3.20-6 list past, present, and foreseeable projects within the CEA. Of the 12 reasonably foreseeable future projects noted, 6 are utility scale renewable energy projects totaling 27,714 acres which would substantially increase developed human use of land.

4.18.12.1 Zone-Specific Cumulative Effects

East Plains and Kofa Zone

Two large-scale solar facilities are planned in this portion of the CEA, the Harquahala Solar Project in Maricopa County and the La Paz County land conveyance for solar development in La Paz County, both would be south of I-10. The Harquahala Solar Project would be in an area currently under agricultural use, while the La Paz County land conveyance would be in an undeveloped desert area. However, both facilities could not be viewed simultaneously in conjunction with the

Project. For travelers along I-10, these future facilities, in conjunction with the Project and the existing Harquahala Power Plant, would change the character of the landscape from either undeveloped or rural to heavy energy infrastructure.

Quartzsite Zone

South of Quartzsite along Segments qs-02 and x-07, the combination of the Project with the existing transmission infrastructure would intensify the visual sense of energy infrastructure, and increase the level of visual clutter, similar to the DPV1 transmission line. However, southwest of Quartzsite, the transmission line would be viewed in context of development along the edge of Quartzsite, which would help the addition of the Project to blend and be less noticeable.

Copper Bottom Zone

Similar to the Quartzsite zone, the Project in conjunction with the existing DPV1 infrastructure in the Copper Bottom Pass area, would intensify the visual sense of roads, energy infrastructure, and increase the level of visual clutter. Along I-10, the combination of the highway and transmission infrastructure would increase the sense of development within the corridor as viewed by travelers along I-10. If visible from I-10, the reasonably foreseeable West Port Gold Project would increase the industrial character as well.

Colorado River and California Zone

The majority of future development would occur in California, in the vicinity of the Colorado River Substation. The addition of four solar projects and associated gen-tie lines, and the Blythe Energy Power Plant/Sonoran Energy Project in conjunction with the Project and existing energy infrastructure, would change the character of the landscape in that area; but in the context of heavy energy infrastructure, the Project would blend and not be individually noticeable.

4.18.13 Irreversible and Irretrievable Commitment of Resources

The main irreversible or irretrievable commitment of resources with regard to visual resources would be the effects of ground disturbance. Because of the desert environment, reclamation and revegetation to achieve a visually naturalized state is extremely difficult, if not impossible. While structures, foundations, and conductors can all be physically removed at the end of the life of the Project, disturbance from cleared bases and access routes may never fully visually recover.

4.18.14 Relationship of Short-term Uses and Long-term Productivity

Short-term impacts on viewsheds in the Project Area would be tied to temporary visual intrusions from construction activities and structures. The visual intrusion of the transmission line and landscape contrast created by the Project infrastructure would remain for the operational life of the Project. As stated in Section 4.18.4.1, ground disturbance may remain visible and indefinitely impact the viewshed to varying degrees.

4.19 WATER RESOURCES (SURFACE AND GROUNDWATER)

4.19.1 Introduction

Impacts to water resources are discussed in terms of surface water, groundwater, and water quality.

4.19.2 Methods for Analysis

4.19.2.1 Analysis Area

The environmental consequences for water resources includes the presumed ROW width for construction, as well as the larger water resources analysis area, which is 4,000 feet encompassing the Proposed and Alternative segments. In addition, there is some chance that the potential for indirect environmental consequences for water resources could extend beyond the study area. For surface water this could occur in a downstream direction within drainages, up to or beyond the confluence of the next major watercourse. For groundwater, consequences to an aquifer could include either a drawn down due to Project water use (i.e., a groundwater quantity effect) or a liquid contaminant release (i.e., a groundwater quality effect). Last, while there are specific water resources within the presumed ROW, they may or may not be impacted by the final construction ROW due to the preferred final design approach of avoiding water features.

4.19.2.2 Assumptions

The analysis assumes that all appropriate design features, APMs, and BMPs (Appendix 2A) would be implemented. All categories of these would be mandatory, and where applicable would be in place before construction begins.

<u>Surface Water</u>

The primary assumptions for analyzing impacts to surface waters are:

- all appropriate construction stormwater permits would be in place, which would require that a SWPPP has been prepared and implemented;
- spill prevention and spill response would be in place and all spills or discharges could and would be properly addressed; and,
- perennial or flowing waters have a greater risk of impact from stormwater runoff or spills than ephemeral washes.

<u>Floodplains</u>

The primary assumptions for analyzing impacts to floodplains are:

- FEMA-mapped floodplain and CDWR-mapped flood hazard areas (defined and identified in Section 3.19.3.1) would be temporarily impacted wherever they are crossed by the ROW.

- No permanent structures would be placed in floodplains that are narrower at the ROW crossing than the typical span width of 1,200 feet (i.e., it is assumed that such floodplains could be spanned and avoided).
- In areas where floodplain maps are not available, placement of permanent structures within well-defined flow channels would be considered an impact.
- The final determination of actual impacts to floodplains cannot be made until detailed design plans are available.
- Even where a permanent pole structure must be located within a flood zone, it would occupy a minimal portion of the cross-sectional area of the channel and would thereby have minimal impact on the depth/velocity/extent flood flows when compared to the existing condition.

<u>Wetlands and Waters of the US</u>

The primary assumptions for analyzing impacts to wetlands and WOUS are:

- Ephemeral drainages/washes are regulated under Section 404 of the Clean Water Act and so any linear water feature (identified in Section 3.19.3.1) crossed by the ROW would be a potential WOUS that could be impacted.
- Any wetland (identified in Section 3.19.3.1) crossed by the ROW could be impacted.
- Final design and placement of the ROW and the permitting process that is required under Section 404 of the CWA would attempt to avoid both wetlands and WOUS, thus impacting only those where disturbance is unavoidable. For example, a WOUS or wetland would be considered unavoidable if it is large enough or configured such that it cannot be spanned with the typical span length of 1,200 feet.
- Where disturbance of a wetland or other WOUS is unavoidable, Section 404 compliance would likely occur through coverage under NWP 12 - Utility Line Activities, unless the coverage requirements (e.g., acreage loss) of that general permit could not be met, in which case an Individual Permit would be pursued.

<u>Groundwater</u>

The primary assumptions for analyzing impacts to groundwater are:

- Although the amount of water needed for construction (dewatering, concrete mixing) is provided in Table 2.2-14, the actual locations of where this water would be obtained are not, other than to say it would be from established sources, private wells, and/or municipal supplies with appropriate allocations and approvals for the quantity of water needed, thus impacts of using this already approved and allocated source are avoided. This analysis assumes that water sources would be widely distributed along the construction route and are therefore considered minimal and not explicitly analyzed.
- Any damage to wells, canals, or other water infrastructure is highly unlikely, but if it occurred the structure would be replaced or repaired. Therefore, these impacts are not explicitly analyzed.

- Due to the design features, APMs, and BMP commitments that would prevent or mitigate spills or other contamination, there is little risk to groundwater quality. Though small, risk would be greater in areas of known shallow groundwater, which is where the analysis focuses.

4.19.2.3 Environmental Effect Indicators, Magnitude, and Duration

Impacts to water resources would occur if the following were to occur:

- Predicted violation of Federal and/or state water quality standards due to contamination of surface water or groundwater due to erosion, storm water runoff, or spill.
- Predicted impacts to water rights or water usage by humans, aquatic wildlife, or plants, designated or otherwise.
- Physical alterations to channels, existing drainage patterns, floodplains, water conveyances, or wells, or indirect alterations to adjacent properties due to erosion or siltation.
- Impacts that would violate Section 404 of the Clean Water Act or Section 10 of Rivers and Harbors Act.
- Flooding or floodplain impacts from construction activities or structure placement.

Impacts to water resources may be negligible, minor, moderate, or major, and may have durations that are qualified as temporary, short term, or long term (Table 4.1-1, Section 4.1).

4.19.3 No Action Alternative

Under the No Action Alternative, no ROW would be granted for the Project and the transmission line, SCS, and ancillary facilities would not be constructed. Current water resources conditions in the analysis area described in Section 3.19 would continue under the No Action Alternative. There would be no changes that would alter water resources beyond current conditions.

4.19.4 Construction of Action Alternative Segments

4.19.4.1 Direct and Indirect Effects Common to All Action Alternatives

The Project would use water that may come from a permitted source associated with a water right. The Project would not contribute to depleting the water sources associated with the water right.

All Action Alternatives have the potential, though unlikely, for a release of contaminants to surface waters and/or shallow groundwater during construction.

There would be no intentional release of any potential contaminants to any water resources. However, petroleum products (e.g., oil, gasoline, diesel) and other hazardous materials (e.g., cement, additives, form oil) could impact surface water or shallow groundwater if inadvertently released. The Project includes control measures, APMs, and BMPs to minimize this risk (Appendix 2A, Section 2A.13). It is assumed that these standard industry practices would be implemented properly and would be effective at minimizing the risk for accidental release of contaminants to surface water or shallow groundwater. As such, there are no predictions that any violation of Federal and/or state water quality standards, or any hindrance to any water users, would occur due to spills. This would be a direct, negligible, and short-term impact.

Construction-related ground disturbance and the resultant potential for increased erosion and sedimentation via stormwater runoff could impact nearby surface waters. The Project includes control measures, APMs, and BMPs (Appendix 2A, Section 2A.13) to minimize this risk. It is assumed that the SWPPP(s) would appropriately specify locations for these measures and verify proper implementation such that they would stabilize disturbed ground, control erosion from disturbed areas, and prevent sediment from entering surface waters. If so, they would effectively minimize risks associated with erosion and movement of sediment in stormwater. As such, there are no predictions that any violation of Federal and/or state water quality standards, or any hindrance to any water users, would occur due to erosion or sedimentation. This would be a direct, negligible, and short-term impact.

Ephemeral channels dominate the surface water resources in the study area. As noted in Section 3.19, their primary functions include providing adequate capacity for flood control, energy dissipation, and sediment movement. These functions would not be compromised by the Project, due to the above-noted measures, APMs, and BMPs. This would be a direct, negligible, and short-term impact.

Some characteristics encountered for individual route segments may represent special conditions that could need to be specially assessed in regard to control measures, APMs, and BMPs. These site-specific conditions are identified in the following sections for each zone, alternative, subalternative, or segment, as appropriate. In general, final design would emphasize avoidance of WOUS, wetlands, and floodplains for structure locations. Whether avoided or not, compliance with Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act would ensure that any physical alterations of channels, wetlands, or floodplains would be mitigated to ensure their continuing functioning. Section 404 compliance would likely occur through coverage under NWP 12 - Utility Line Activities, unless the coverage requirements (e.g., acreage loss) of that general permit could not be met, in which case an Individual Permit would be pursued. Specific identifiable potential exceptions are identified in the following sections. Further, a floodplain statement of findings is included in Section 4.19.10.1 (Unavoidable Adverse Effects). This would be a direct, negligible, and short-term impact.

There are groundwater wells along all of the Action Alternatives; however, it is assumed that they could be avoided or would be replaced with no impact. Prior to construction, the locations of wells would be confirmed in the field and the Project would need to consult the owners of existing wells that are situated in the proposed ROW. At this time, it is unknown if any wells would require closure or modifications because of Project construction.

Water sources for the Project would be widely distributed along the project alignment, over a 2-year construction period. Such a wide distribution of sources, including private wells and/or municipal supplies, and over a long period of time, would minimize the potential for overdraft of any individual water supply.

Specific variations in certain key features (e.g., number of crossings, width of floodplains) are called out in the following zone, segment, action alternative, and subalternative sections in order to provide a means of comparison. These comparisons primarily relate to quantities (e.g., number of crossings, width of floodplains) as a means of differentiation. However, as indicated in the previous discussions, the basic assumption is that all control measures, APMs, and BMPs would be effective and impacts would not occur or at most would be negligible. Therefore, construction-related impacts to water resources are classified as direct, negligible at most, and short term. There are no indirect impacts to water resources.

4.19.4.2 East Plains and Kofa Zone

Direct and Indirect Effects Common to All Segments in the Zone

This zone includes a number of canal and/or ditch crossings, as wells as reaches of likely non-wetland WOUS and high-risk flood hazard zones, as shown in Table 4.19-1. It does not include any perennial stream crossings or wetland areas. While as described above in Section 4.19.2.2, it is assumed that controls, APMs, and BMPs would prevent or minimize impacts to these water resource features, the greater the number of features or the higher the affected lengths, the higher the likelihood for an inadvertent impact. The ephemeral nature of stream flows in this zone would reduce the likelihood that an inadvertent impact would be sustained or conveyed downstream (i.e., reduced likelihood that flow would be present at the time of any release).

Table 4.19-1 Potential Water Resource Impacts for East Plans and Kofa Zone

SEGMENT	IRRIGATION CANAL/DITCH CROSSINGS	PERENNIAL STREAM CROSSINGS	WETLAND CROSSING LENGTH (FEET)	WOUS (NON-WETLAND) CROSSING LENGTH (FEET)	HIGH RISK FLOOD HAZARD ROUTE LENGTH (MILES)
p-01	—	—	—	1,357	1.7
p-02	—	—	—	—	—
p-03	—	—	—	29	—
p-04	—	—	—	104	—
p-05	—	—	—	54	—
p-06	—	—	—	954	0.9*
d-01	5	—	—	1,167	7.8
i-01	—	—	—	297	—
i-02	—	—	—	—	—
i-03	1	—	—	1,467	2.3*
i-04	—	—	—	556	—*
in-01	—	—	—	922	—*
x-01	1	—	—	86	—
x-02a	—	—	—	—	—
x-02b	—	—	—	24	—

SEGMENT	IRRIGATION CANAL/DITCH CROSSINGS	PERENNIAL STREAM CROSSINGS	WETLAND CROSSING LENGTH (FEET)	WOUS (NON-WETLAND) CROSSING LENGTH (FEET)	HIGH RISK FLOOD HAZARD ROUTE LENGTH (MILES)
x-03	—	—	—	28	—
x-04	—	—	—	687	1.7*
Alt. SCS Dist. Line	—	—	—	63	—

*FEMA mapping is not available parts or all of Segments p-06, i-03, i-04, in-01, and x-04.

Direct and Indirect Segment-specific Effects

As shown in Table 4.19-1 above, several segments in the East Plains and Kofa Zone would cross canals and/or irrigation ditches. The CAP canal would be crossed twice by Segment p-01, twice by Segment i-01, and twice by Segment i-03. The CAP canal essentially functions as one of the few live water sources in the study area, and if there were an inadvertent release to it, contamination could be conveyed downstream more readily than if one occurred in the vicinity of any of the more numerous ephemeral channels. The other irrigation ditch crossings (in Segments p-06, d-01, x-01, and x-04) represent smaller agricultural features associated with the Harquahala Irrigation District system and may or may not have water present during construction. Segments p-02, i-02, and x-02a do not have any potential WOUS crossings, but all other segments and the Alternative SCS 12kV distribution line in the reach have numerous, potentially requiring 404 permitting if avoidance is not possible. Table 3.19-4 shows the number of crossings in these segments, which make up the combined lengths in Table 4.19-1.

Based upon the available FEMA mapping, high risk floodplains (Table 4.19-1) could likely be avoided for structure placement, except for: the two wide floodplain crossings associated with Centennial Wash, one near the western end of Segment p-01, and the other along Segment d-01; and the wide floodplain crossings associated with Bouse Wash along Segments p-06, i-03, and x-04. In those cases, the width of the mapped floodplain is greater than the likely span width of 1,200 feet. Table 3.19-3 shows the area within the study area associated with these floodplain crossings. Note the segments or segment pieces where FEMA mapping is not available; flood risk cannot be determined for certain in those areas.

Several ponds, tanks, or other structures associated with SWFs (SWF-01 through SWF-05 in Table 3.19-2 and Appendix 1, Figures 3.19-1a-w) would be within the presumed ROW for Segments p-01, d-01, x-01, and i-01, but it is assumed that they could be avoided or would be replaced with no impact. Similarly, there are numerous groundwater wells along most of these segments (Appendix 1, Figures 3.19-2a-c), but it is assumed that they could be avoided or would be replaced with no impact. Avoidance may be more difficult where the wells are numerous and clustered, as in Segment d-01 (Table 3.19-5; Appendix 1, Figure 3.19-2a).

4.19.4.3 Quartzsite Zone

Direct and Indirect Effects Common to All Segments in the Zone

This zone includes a few smaller canal and/or ditch crossings, as well as reaches of non-wetland WOUS and high-risk flood hazard zones, as shown in Table 4.19-2. It does not include any perennial stream crossings or wetland areas. While as described above in Section 4.19.2.2, it is assumed that controls, APMs, and BMPs would prevent or minimize impacts to these water resources, the greater the number of features or the higher the affected lengths, the higher the likelihood might be for an inadvertent impact. The ephemeral nature of stream flows in this zone would reduce the likelihood that an inadvertent impact would be sustained or conveyed downstream (i.e., reduced likelihood that flow would be present at the time of any release).

Table 4.19-2 Potential Water Resource Impacts for Quartzsite Zone

SEGMENT	IRRIGATION CANAL/DITCH CROSSINGS	PERENNIAL STREAM CROSSINGS	WETLAND CROSSING LENGTH (FEET)	WOUS (NON-WETLAND) CROSSING LENGTH (FEET)	HIGH RISK FLOOD HAZARD ROUTE LENGTH (MILES)
p-07	—	—	—	84	—*
p-08	—	—	—	—	—*
i-05	—	—	—	488	—
qn-01	—	—	—	34	—
qn-02	—	—	—	803	0.6
qs-01	—	—	—	474	—*
qs-02	—	—	—	1,129	1.4
x-05	—	—	—	476	—*
x-06	—	—	—	393	—*
x-07	—	—	—	253	—*

*FEMA mapping is not available parts or all of Segments p-07, p-08, qs-01, x-05, x-06, and x-07.

Direct and Indirect Segment-specific Effects

As shown in Table 4.19-2 above, only a couple of segments (qn-02, qs-02) in the Quartzsite Zone would cross canals and/or irrigation ditches. All but one segment (p-08) has numerous potential WOUS crossings, which could potentially require 404 permitting if avoidance is not possible. Table 3.19-4 shows the number of crossings in these segments, which make up the combined lengths in Table 4.19-2.

High risk floodplains (Table 4.19-2) could likely be avoided for structure placement, except for the wider floodplain crossings along Segment qs-02, associated with La Cholla Wash and tributaries and Tyson Wash. Table 3.19-3 shows the area within the study area associated with these crossings. Note that several of the segments or segment pieces in this zone do not have FEMA mapping available; flood risk cannot be determined for those areas.

As noted in Table 3.19-5 and Figures 3.19-2a-c (Appendix 1), groundwater wells are sparse along most of these segments (except possibly Segments qs-01 and qs-02 where there are several in proximity to each other), and it is assumed that these structures could be avoided or would be replaced with no impact.

4.19.4.4 Copper Bottom Zone

Direct and Indirect Effects Common to All Segments in the Zone

Canal and/or ditch crossings are mostly absent in this zone, and there are no perennial stream crossings or wetland areas. There are numerous non-wetland WOUS and multiple high-risk flood hazard zones, as shown in Table 4.19-3. While as described above in Section 4.19.2.2, it is assumed that design features, APMs, and BMPs would prevent or minimize impacts to these water resources, the greater the number of features or the higher the affected lengths, the higher the likelihood might be for an inadvertent impact. The ephemeral nature of stream flows in this zone would reduce the likelihood that an inadvertent impact would be sustained or conveyed downstream (i.e., reduced likelihood that flow would be present at the time of any release). Although deposition may not occur at times of stream flow, a localized storm could mobilize accumulated material. Sediment or other material introduced by the Project could move through the system in a pulsed manner related to the intensity, duration, and frequency of storm flows.

Table 4.19-3 Potential Water Resource Impacts for Copper Bottom Zone

SEGMENT	IRRIGATION CANAL/DITCH CROSSINGS	PERENNIAL STREAM CROSSINGS	WETLAND CROSSING LENGTH (FEET)	WOUS (NON-WETLAND) CROSSING LENGTH (FEET)	HIGH RISK FLOOD HAZARD ROUTH LENGTH (MILES)
p-09	—	—	—	396	—*
p-10	—	—	—	51	—*
p-11	—	—	—	52	—*
p-12	—	—	—	311	0.2
p-13	—	—	—	282	0.6
p-14	—	—	—	730	0.3
cb-01	—	—	—	—	—*
cb-02	—	—	—	848	—*
cb-03	—	—	—	1,741	—*
cb-04	—	—	—	79	—
cb-05	—	—	—	1,525	0.9
cb-06	—	—	—	24	0.1
i-06	—	—	—	701	0.5

SEGMENT	IRRIGATION CANAL/DITCH CROSSINGS	PERENNIAL STREAM CROSSINGS	WETLAND CROSSING LENGTH (FEET)	WOUS (NON-WETLAND) CROSSING LENGTH (FEET)	HIGH RISK FLOOD HAZARD ROUTH LENGTH (MILES)
i-07	—	—	—	422	0.7
x-08	—	—	—	92	—

*FEMA mapping is not available parts or all of Segments p-09, p-10, p-11, cb-01, cb-02, and cb-03.

Direct and Indirect Segment-specific Effects

As shown in Table 4.19-3 above, the only segment in the Copper Bottom Zone that would cross a canal or irrigation ditch is Segment p-09. All but one segment (Segment cb-01) have numerous potential WOUS crossings and would potentially require 404 permitting if avoidance is not possible. Table 3.19-4 shows the number of crossings in these segments, which make up the combined lengths in Table 4.19-3.

Based upon the available FEMA mapping, high risk floodplains (Table 4.19-3) could likely be avoided for structure placement, except for the wider floodplain crossings along Segment i-07, associated with Ehrenberg Wash and Cinnabar Wash. Table 3.19-3 shows the area within the study area associated with these crossings. Note the segments or segment pieces where FEMA mapping is not available; flood risk cannot be determined for those areas.

There are very few groundwater wells in this zone (Table 3.19-5; Appendix 1, Figures 3.19-2a-c), and it is assumed that they could be avoided or would be replaced with no impact.

4.19.4.5 Colorado River and California Zone

Direct and Indirect Effects Common to All Segments in the Zone

This zone includes many canal and/or ditch crossings associated with the Palo Verde Irrigation District concentrated in about one-half of the segments Table 4.19-4. There are also crossings for non-wetland WOUS and high-risk flood hazard zones throughout the zone. Unlike the other three zones, this zone includes perennial stream crossings and wetland areas associated with the Colorado River (discussed below by segment). While as described above in Section 4.19.2.2, it is assumed that design features, APMs, and BMPs would prevent or minimize impacts to these water resources, the greater the number of features or the higher the affected lengths, the higher the likelihood might be for an inadvertent impact. The existing impairment designation of the Colorado River would not be affected by any of the proposed activities in this zone, for any of the segments, as the impairment listing is for Toxicity from an unknown source or sources, and the aforementioned design features, APMs, and BMPs would prevent or minimize the potential for even a short-term, isolated contribution of materials that could contribute to toxicity.

Table 4.19-4 Potential Water Resource Impacts for Colorado River and California Zone

SEGMENT	IRRIGATION CANAL/DITCH CROSSINGS	PERENNIAL STREAM CROSSING	WETLAND CROSSING LENGTH (FEET)	WOUS (NON-WETLAND) CROSSING LENGTH (FEET)	HIGH RISK FLOOD HAZARD ROUTH LENGTH (MILES)
p-15e	—	1	1,195	569	1.0
p-15w	10		61	718	0.1*
p-16	10	—	—	191	—*
p-17	—	—	—	376	—*
p-18	—	—	—	89	—*
i-08s	1	1	379	156	0.4
ca-01	11		104	381	—*
ca-02	6	—	—	1,244	—*
ca-04	1	—	105	824	0.1*
ca-05	12	—	71	299	—*
ca-06	4	—	—	55	—*
ca-07	—	—	—	—	—*
ca-09	—	—	—	61	—*
cb-10	—	1	1,162	782	0.7*
x-09	1	—	—	20	—*
x-10	2	—	—	360	—*
x-11	2	—	—	479	0.1*
x-12	—	—	—	51	—*
x-13	3	—	—	280	—*
x-15	—	—	—	—	—*
x-16	—	—	—	—	—*
x-19	—	—	—	—	—*

*FEMA mapping is not available for parts or all of the segments in this zone, except for p-15e, where it is available.

Direct and Indirect Segment-specifics Effects

As shown in Table 4.19-4 above, numerous segments in the Colorado River and California Zone would cross canals and/or irrigation ditches. Segments p-15w, p-16, ca-01, and ca-05 each have a relatively large number of these crossings; Segments ca-04, ca-06, x-09, x-10, x-11, x-12, and x-

13 have some, but fewer, canal or ditch crossings; and the other segments do not have any crossings. Most segments have numerous potential non-wetland WOUS crossings and would potentially require 404 permitting if avoidance is not possible. In addition to compliance with Section 404 of the Clean Water Act, construction in segments that cross the Colorado River would also need to comply with Section 10 of the Rivers and Harbors Act, which would ensure that any physical alterations of the associated channel, wetland, or floodplain would be mitigated to ensure continuing functioning. Table 3.19-4 shows the number of crossings in these segments, which make up the combined lengths in Table 4.19-4.

Segments p-15e, p-15w, cb-10, x-11, i-08s, and ca-04 all cross the Colorado River[6]. For these six segments, which cross the perennially flowing Colorado River, there would be an increased risk of local and downstream contamination if an inadvertent spill or release were to occur, when compared to the other ephemeral streams in this zone.

A Nationwide Permit Number 12 (NWP 12), Utility Line Activities preconstruction notification (PCN) submitted to USACE may be required for towers sited within the ordinary high water mark of the Colorado River in which a Section 10 permit is to be submitted because utility lines consisting of aerial electric power transmission lines crossing navigable waters of the US (which are defined at 33 CFR part 329 and include the Colorado River) must comply with the applicable minimum clearances specified in 33 CFR 322.5(i). A PCN is not predicted to be required for foundations within Section 404 jurisdictional washes because foundation footings would be micro-sited outside of Section 404 jurisdictional washes where possible and the maximum permanent loss of waters of the US at any tower totals much less than 0.5-acre.

Wetlands are associated with some of the same segments that cross the Colorado River (i.e., Segments p-15e, p15w, cb-10, i-08s, and ca-04). In addition, Segments ca-01 and ca-05 have wetland areas that are apparently associated with agricultural areas. Wetland determinations made during the baseline study were based upon available resource information, as described in Section 3.19.2, and would need to be refined at a permitting level once a final route was determined. Project-related impacts on WOUS, including wetlands, if unavoidable, would likely also require a Section 404 of the CWA permit. Based on previous discussions with USACE, any discharge of fill into wetlands would require an Individual Permit. If wetland impacts are avoidable but impacts on non-wetland WOUS occur, construction of the Project may be authorized under NWP 12 – Utility Line Activities (HDR 2016f).

Note that all but one of the segments for this zone lack available FEMA mapping across some or all the segments (Table 4.19-4); flood risk cannot be determined for those areas. High risk floodplains are associated with Segments p-15e, cb-10, p-15w, ca-4, and x-11. The latter three could likely be avoided for structure placement, but the wider floodplain crossings at Segments p-15e and cb-10 associated with the Colorado River may not be able to be spanned without a structure. Table 3.19-3 shows the area within the study area associated with these crossings. Note

[6] Segment nodes are located mid-stream, so although there is one Proposed Action crossing and two Alternative crossings, there are six segments involved in the crossings. Further, the perennial stream crossings in Table 4.19-4 are only assigned to one of the segments per pair, so as not to double-count crossings.

the segments or segment pieces where FEMA mapping is not available; flood risk cannot be determined for those areas.

There are groundwater wells along many of these segments (Table 3.19-5; Appendix 1, Figures 3.19-2a-c), but it most cases, it is assumed that they could be avoided or would be replaced with no impact. Along Segment ca-01, however, there are a number of closely spaced wells, and avoidance of all of them might be more difficult. Shallow groundwater may be found near the Colorado River, and encountered during structure placement. Proper implementation of design, APMs, and BMPs (Appendix 2A, Section 2A.13) would protect groundwater quality.

4.19.5 Operations, Maintenance, and Decommissioning

Similar control measures, APMs, and BMPs as used during construction would be implemented during operation and maintenance, and decommissioning. These would continue to minimize the potential for accidental release of potential contaminants; reduce erosion and movement of sediment in stormwater; and prevent impacts to WOUS, floodplains, and wetlands. This would be a negligible impact, as it is under the construction phase, but long term because the Project would last more than 10 years.

4.19.6 Mitigation Measures

There are no additional specific water resources MMs that are needed beyond the design features, APMs, and BMPs (Appendix 2A, Section 2A.13). This applies to the Proposed Action and all alternatives, to all subalternatives, and to all individual segments. Thus, mitigation is not discussed below for these components.

4.19.7 Construction of Full Route Alternative and Subalternative Effects

Given the environmental water resources conditions along the proposed and alternate routes as described in Section 3.19, as well as assumptions listed in Section 4.19.2.2, there are no major substantive differences between the routes, and no major impacts. The most important water resources feature is the Colorado River (and its associated wetlands, floodplains, and shallow groundwater), which must be crossed under all alternative routes. There are variations in the number of canal/ditch and ephemeral drainage crossings, and variations in the lengths of non-wetland WOUS and high-risk floodplains among alternative routes (Table 4.19-5). While as stated there may be a greater likelihood of inadvertent impact where there are more such crossings, the design features, APMs, and BMPs are assumed to prevent impacts to the same degree. The ephemeral nature of almost all the streams study area would reduce the likelihood that an inadvertent impact would be sustained or conveyed downstream (i.e., reduced likelihood that flow would be present at the time of any release).

Table 4.19-5 Alternative Route Comparisons for Water Resource Impacts

ALTERNATIVE ROUTE	IRRIGATION CANAL/DITCH CROSSINGS	PERENNIAL STREAM CROSSINGS	WETLAND CROSSING LENGTH (FEET)	WOUS (NON-WETLAND) CROSSING LENGTH (FEET)	HIGH RISK FLOOD HAZARD ROUTH LENGTH (MILES)
Proposed Action	20	1	1,256	6,347	4.8
1: I-10 Route	20	1	555	8,190	7.1
2: BLM Utility Corridor Route	21	1	1,256	8,253	6.2
3: Avoidance Route	18	1	1,266	8,640	6.0
4: Public Lands Emphasis Route	22	1	1,256	7,347	9.8

4.19.7.1 Proposed Action

Although much of the Proposed Action would be within an existing utility corridor and adjacent to other existing linear facilities, the structures would not be co-located, so new disturbances would be needed along much or all the ROW. However, the Proposed Action would generally allow the use of existing access roads, thereby minimizing new surface disturbance associated with access roads.

The Proposed Action would cross the CAP canal twice (Segment p-01). It would cross the Colorado River at a location where the floodplain is wide on the east side of the River (Segment p-15e) and where wetlands are interspersed on the floodplain; this may make it difficult to span without placing a structure in this feature. Further, wetlands would be crossed along Segments p-15e and p-15w, associated with the river crossing. As a perennial stream, the Colorado River would have an increased risk of local and downstream contamination if an inadvertent spill or release were to occur, when compared to the other ephemeral streams in the study area.

The Proposed Action would also cross wide ephemeral wash floodplains in Segments p-01 and p-06, increasing the odds that one or more structures would need to be placed within a floodplain.

4.19.7.2 Alternative 1: I-10 Route

Alternative 1 would cross the CAP canal six times (in Segments p-01, i-01, and i-03). It would cross the Colorado River further north than any of the other full route alternatives at a location that has a narrower floodplain (Segments i-08s and ca-04). Wetlands would be crossed along these Colorado River segments as wells as along Segment ca-05. Alternative 1 would also cross wide ephemeral wash floodplains in Segments p-01, i-03, qs-02, and i-07, increasing the odds that one or more structures would need to be placed within a floodplain. Last, groundwater wells are numerous and clustered in Segments qs-01 and qs-02, which may make them more difficult to avoid.

Subalternatives to Alternative 1 (1A through 1E)

Subalternatives 1A and 1B
These subalternatives would eliminate two CAP canal crossings, but otherwise would have the same water resources impact potential as Alternative 1.

Subalternatives 1C and 1D
These subalternatives would essentially have the same water resources impact potential as Alternative 1.

Subalternative 1E
This subalternative would add a segment that has closely spaced wells which may be difficult to avoid, but would essentially have the same water resources impact potential as Alternative 1.

4.19.7.3 Alternative 2: BLM Utility Corridor Route

Alternative 2 would cross the CAP canal six times (in Segments p-01, i-01, and i-03). It would cross the Colorado River at a location where the floodplain is wide (Segment p-15e) and wetlands are present (Segments p-15e and p-15w). Alternative 2 would also cross wide ephemeral wash floodplains in Segments p-01, i-03, and x-04, increasing the odds that one or more structures would need to be placed within a floodplain. Last, groundwater wells are numerous and clustered in Segment qs-01, which may make them more difficult to avoid.

Subalternatives to Alternative 2 (2A through 2E)

Subalternative 2A
This subalternative would eliminate four CAP canal crossings, but would add Segment d-01 where wells are numerous and clustered, and may not be easily avoided. Otherwise, it would have the same water resources impact potential as Alternative 2.

Subalternative 2B
This subalternative would eliminate two CAP canal crossings, but otherwise, it would have the same water resources impact potential as Alternative 2.

Subalternatives 2C -2E
These subalternatives would have the same water resources impact potential as Alternative 2.

4.19.7.4 Alternative 3: Avoidance Route

This route would cross the CAP canal four times (in Segments p-01and i-03). It would cross the Colorado River at a location where the floodplain is wide and wetlands are present (Segment cb-10). Alternative 3 would also cross wide ephemeral wash floodplains in Segments p-01 and i-03, increasing the odds that one or more structures would need to be placed within a floodplain. Last, groundwater wells are numerous and clustered in Segment ca-01, which may make them more difficult to avoid.

Subalternatives to Alternative 3 (3A through 3M)

Subalternative 3A and 3C
These subalternatives would eliminate two CAP canal crossings, otherwise it would have the same water resources impact potential as Alternative 3.

Subalternative 3B
This subalternative would add two CAP canal crossings, otherwise it would have the same water resources impact potential as Alternative 3 without this subalternative.

Subalternatives 3D, 3F, 3G, 3H, 3J, 3K, 3L, and 3M
These subalternatives would essentially have the same water resources impact potential as Alternative 3.

Subalternative 3E
This subalternative would add a segment where it may be more difficult to avoid wells as they are numerous and clustered. Otherwise, the subalternative would essentially have the same water resources impact potential as Alternative 3.

4.19.7.5 Alternative 4: Public Lands Emphasis Route

Alternative 4 avoids all CAP canal crossings. It would cross the Colorado River at a location where the floodplain is wide (Segment p-15e) and wetlands are present (Segments p-15e and p-15w). Alternative 4 would also cross wide ephemeral wash floodplains in Segments d-01 and x-04, increasing the odds that one or more structures would need to be placed within a floodplain. Last, groundwater wells are numerous and clustered in Segment d-01, which may make them more difficult to avoid.

Subalternatives to Alternative 4 (4A through 4P)

Subalternatives 4A, 4B
These subalternatives would add two CAP canal crossings, but would otherwise have the same water resources impact potential as Alternative 4.

Subalternatives 4C, 4D, 4E, 4F, 4G, 4J, 4M, 4N, and 4P
These subalternatives would essentially have the same water resources impact potential as Alternative 4.

Subalternatives 4H, 4K, and 4L
These subalternatives would add another possible area of wide floodplain that may not be able to be spanned. Otherwise, it would essentially have the same water resources impact potential as Alternative 4.

4.19.8 Residual Impacts

There would not be any mitigation for water resources; therefore, there would not be any residual impacts.

4.19.9 CDCA Plan Compliance

CMAs LUPA-BIO-9, LUPA-BIO-13, LUPA-BIO-14, LUPA-SW-16, LUPA-SW-18, LUPA-SW-21, LUPA-SW-22, LUPA-BIO-DUNE-2, and LUPA-BIO-DUNE-3 would apply to the Project (Appendix 2C). The Project would comply with these CMAs through APM-WQ-01 and BMP-WQ-04, BMP-WQ-05, BMP-WQ-06, and BMP-WQ-07 (Appendix 2A), and analysis in this section demonstrating requirements for floodplain management and protection of wetlands are met. Compliance with LUPA-SW-20 is demonstrated by the fact that no residual impacts are identified.

4.19.10 Unavoidable Adverse Effects

No unavoidable adverse impacts to water quality are anticipated. No exceedances of surface or groundwater quality protection standards would be expected due to the Project.

4.19.10.1 Floodplain Statement of Findings

EOs 11988 "Floodplain Management" (May 24, 1977) and 11990 "Protection of Wetlands" (May 24, 1977) direct Federal agencies to undertake various actions to protect floodplains and wetlands, including preparing floodplain or wetland assessment for any action proposed in a floodplain and new construction proposed in a wetland. DOE's regulations implementing these EOs, Compliance with Floodplain and Wetland Environmental Review Requirements (10 CFR 1022), require that any floodplain or wetland assessment normally be included in an environmental assessment or EIS, if one is being prepared (10 CFR 1022.13(b)). A floodplain or wetland assessment includes a description of the Proposed Action, a discussion of its potential effects on the floodplain or wetland (including a discussion of floodplain or wetland values), and consideration of alternatives (10 CFR 1022.4). The outcome of a floodplain assessment is documented in a floodplain statement of findings, which may be incorporated into a final EIS or ROD (10 CFR 1022.14(c)). A wetland statement of findings may be similarly prepared for a wetland assessment but is not required.

In accordance with DOE regulations contained at 10 CFR 1022, Compliance with Floodplain and Wetlands Environmental Review Requirements, this Technical Environmental Study includes a floodplain assessment and statement of findings that analyzes the potential floodplain impacts associated with the Project as described above in this section discussing potential impacts.

The Action Alternatives would not be likely to disturb or affect any wetlands (e.g., all should be able to be avoided/spanned), thus a wetlands statement of findings is not included. The natural and beneficial functions and values of wetlands would not be compromised by this Project.

Overview of Floodplains Present in Project Area

The study area has a FEMA-designated SFHA associated with the Colorado River, which is the only perennial stream in the study area. There are also a number of SFHAs associated with larger ephemeral washes in the study area, as discussed in Section 3.19. These include Centennial, Bouse, Tyson, La Cholla, Gonzales, Ehrenberg, Limekiln, and Lake washes, as well as La Paz Arroyo. Further, certain parts of the study area have not been mapped by FEMA so the presence of SFHAs is not known.

Impacts to Floodplains

The average span between transmission line poles would be 1,200 feet. For the various alternative routes, floodplains would likely be able to be spanned and thus avoided. As described in Section 4.19.4, certain floodplain crossings would be wider than 1,200 feet and may require a pole placement. Construction disturbance and permanent access roads would also likely cross floodplains. These roads would not be hard-surfaced and appropriate controls on sediment and stormwater would be implemented during construction. It is assumed that any of these floodplain disturbances would be located in sheetwash areas where any potential flooding would be shallow and water velocities low. Project facilities would not impede flows, collect debris, or cause an increase in flooding area.

Justification for Locating the Project in a Floodplain

Pole structures would be placed outside of active channels, but it is not physically possible to fully span all floodplains in the area, some of which are extensive. The relatively narrow-diameter base of the vertical transmission structures would not have a consequential effect in diminishing the capacity of the floodplains, and thus would not exacerbate flood conditions, alter flood patterns, or increase flood risk. This is particularly true for the types of shallow sheetflow experienced throughout the analysis area.

With sediment and erosion control measures in place (Appendix 2A, Section 2A.13), construction disturbance and access roads would not be expected to substantially alter runoff conditions on the floodplain, and thus, would not exacerbate flood conditions, alter flood patterns, or increase flood risk.

Conformance with Floodplain Protection

As described in Chapter 2, numerous design features, APMs, and BMPs (Appendix 2A, Section 2A.13) would minimize potential harm to floodplains, where construction disturbance, access roads, and pole structures could be located. Thus, the Project would conform to applicable floodplain protection standards.

4.19.11 Cumulative Effects

4.19.11.1 Cumulative Effects Common to All Action Alternatives

Various types of land conversion including residential/community development, roads, agriculture, mines, range improvement projects, and other similar activities, as well as wildfires and grazing, have impacted surface water resources and wetlands in the CEA (Tables 3.20-4a and 3.20-5). Some activities such as grazing and mining have changed over time to more resource-conscious management and extraction techniques which have lessened impacts and/or improved conditions.

Within the 2-mile CEA, there are a number of existing or planned operations or activities (Tables 3.20-5 and 3.20-6) that have the potential for accelerated erosion/sedimentation, accidental releases of pollutants, and/or other water resource impacts such as wetland, WOUS, or floodplain encroachment, such as the two mines listed in Table 4.3-2. Further there are many other developments or activities not listed in the tables (e.g., highways, agricultural fields) that also have the potential for similar types of impacts to water resources. Ground disturbances and/or channel rerouting associated with past, present, and RFFAs, as well as the impacts from the Project, may cause increased erosion and sedimentation, and may transport sediments to surface waters.

There would be negligible if any effects to groundwater by the Proposed Action or Action Alternatives, as described in Section 4.19.4, thus the Project would not contribute cumulative impacts to groundwater resources. Therefore, no additional consideration of groundwater resources is included in this section.

As described above, impacts to water resources for the Project were considered negligible at most. Project-related impacts on water resources that are negligible would result in negligible cumulative impacts when considered in conjunction with other activities within the CEA. With implementation of the design features, APMs, and BMPs, the potential cumulative impacts to surface water resources would be negligible to minor.

4.19.11.2 Zone-Specific Cumulative Effects

East Plains and Kofa Zone

Approximately 77,575 acres have been previously disturbed in the East Plains and Kofa Zone (Table 3.20-4a). Much of this (Table 3.20-3a) has been under Federal or state regulatory oversight which includes measures to prevent, monitor, and/or mitigate potential impacts to water resources. The La Paz County land conveyance solar project could impact up to 5,935 acres which has the potential to increase erosion/sedimentation or the accidental releases of pollutants which could find their way to water sources. The Project would not cross any perennial stream or wetland areas in this zone, so would not contribute any cumulative effects from direct crossings.

Quartzsite Zone

Disturbance in the Quartzsite Zone has been limited, mostly associated with the development of Quartzsite and associated infrastructure (4,899 acres). Reasonably foreseeable future project disturbance includes 20 acres of mine development which has the potential to impact water resources. However, that project would have BLM oversight requiring measures to prevent, monitor, and/or mitigate potential impacts to water resources. The Project would not cross any perennial stream or wetland areas in this Zone so would not contribute any cumulative effects from direct crossings.

Copper Bottom Zone

Disturbance in the Copper Bottom Zone has been limited (11,385 acres or 12.9 percent). The vast majority of this zone (>85.0 percent, Table 3.20-3a) has been under Federal or state regulatory oversight which includes measures to prevent, monitor, and/or mitigate potential impacts to water resources. Reasonably foreseeable future project disturbance includes 40 acres of the West Port mine development which has the potential to impact water resources. However, that project would have BLM oversight requiring measures to prevent, monitor, and/or mitigate potential impacts to water resources. The Project would not cross any irrigation canals/ditches, perennial streams, or wetland areas in this Zone so would not contribute any cumulative effects from direct crossings.

Colorado River and California Zone

Quantified disturbance in the Colorado River and California Zone includes 71,329 acres or about 74 percent (Table 3.20-4a) of the zone. Reasonably foreseeable future projects in this zone include three utility scale solar projects and a power plant (Table 4.3-2) which could contribute an additional 14,601 acres of disturbance; however, none of these are located in proximity to the Colorado River. These projects would be under Federal or state regulatory oversight which would include measures to prevent, monitor, and/or mitigate potential impacts to water resources. Past, present, and reasonably foreseeable future projects that cross the perennially flowing Colorado River, would increase the risk of local and downstream contamination if inadvertent spills or releases were to occur. Federal oversight of the Colorado River would require compliance with Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act that would ensure that any physical alterations of channels, wetlands, or floodplains would be mitigated to ensure their continued functioning.

4.19.12 Irreversible and Irretrievable Commitment of Resources

As indicated in the impact analysis, APMs, BMPs, and standard control measures are largely effective, if properly implemented, at reducing the risk of accidental discharge of pollutants, including sediment, into WOUS. There are unlikely to be any irreversible commitment of groundwater or surface water resources.

Disturbance of WOUS, wetlands, or special aquatic sites would generally be mitigated through the CWA Section 404 permitting process. However, there could be an interim time period when aquatic resources have exhibited some temporary impact, before stabilization, reclamation, or replacement would occur. This time period would represent an irretrievable commitment of water resources.

Placement of permanent structures within the floodplain would represent an impact to floodplain resources. However, floodplain permitting requirements ensure that the floodplains continue to function for flood conveyance without undue harm to existing structures or landowners. Therefore, there are neither irretrievable nor irreversible impacts to floodplain resources.

4.19.13 Relationship of Short-term Uses and Long-term Productivity

Long-term productivity of water resources would be affected by any long-term change in water quality attributable to the Project. As indicated in the impact analysis, APMs, BMPs, and control measures are largely effective at reducing risks that would cause these changes; therefore, no impacts are likely to affect long-term productivity.

4.20 SUMMARY

4.20.1 Resource Management Plan Amendment Summary

4.20.1.1 Yuma RMP Amendment Summary

All portions of the Proposed Action located on BLM-administered public land would be within designated utility corridors; therefore, no plan amendments for land use would be required. An amendment of the Yuma RMP would be required to establish a ROW for any Action Alternative segment outside designated BLM utility corridors.

Table 4.20-1 and Figure 4.20-1 (Appendix 1) provides the Yuma RMP Amendments required for VRM Class changes by Proposed segments.

Table 4.20-1 Proposed Yuma RMP VRM Class Amendments

SEGMENT*	LENGTH	VRM CLASS	AMENDED VRM CLASS	LENGTH AMENDED (MILES)
p-06	35.7	III	IV	0.6**
p-07	2.1	II	IV	2.1
p-08	0.6	III	IV	0.6
p-09	6.9	III	IV	6.9
p-10	1.1	II	IV	1.1
p-11	4.1	III	IV	3.9
p-12	2.5	III	IV	1.1
p-13	3.5	III	IV	3.5

*Segments only listed if an RMP amendment is needed for VRM class within the YFO.

**Only the portion of Segment p-06 west of the Kofa NWR would be amended.

The Action Alternative segments that would require amendment of the Yuma RMP and the types of amendments required are summarized in Table 4.20-2 and shown on Figure 4.20-2 (Appendix 1).

Table 4.20-2 Yuma RMP Amendments by Action Alternative Segment

SEGMENT*	LENGTH (MILES)	VRM CLASS	UTILITY CORRIDOR?	RMPA REQUIRED?	RMP AMENDMENT DESCRIPTION
cb-01	3.2	II	No	Yes	Establish ROW outside of utility corridor; and change from VRM Class II to VRM Class IV outside BLM utility corridor within 0.3-mile either side of the centerline of segments, or in an area bounded by the viewshed where the segment would be within canyons.
cb-02	2.2	II	No	Yes	Establish ROW outside of utility corridor; and change to VRM Class IV within 0.3-mile either side of the centerline of segment, or in an area bounded by the viewshed where the segment would be within canyons, for conformance outside utility corridor; or expand existing utility corridor to contain this segment, and in conjunction with other corridor changes, change VRM Class to Class IV.
cb-03	4.3	II	Yes - Partial	Yes	Change to VRM Class IV on portion of BLM-administered public lands within the utility corridor within the viewshed of the canyon.
cb-04	1.9	II & III	No	Yes	Establish ROW outside of utility corridor; and change to VRM Class IV for the area within 0.3-mile either side of the centerline of the segment, or in an area bounded by the viewshed where the segment would be within canyons.
cb-05	4.4	II & III	Yes - Partial	Yes	Establish ROW outside of utility corridor; and change to VRM Class IV for the area within 0.3-mile either side of the centerline of the segment.
cb-06	1.9	III	Yes - Partial	Yes	Establish ROW outside of utility corridor; and change from VRM Class II to VRM Class IV for the area within 0.3-mile either side of the centerline of the segment.
i-03	19.9	III	Yes - partial	Yes	Establish ROW in areas outside the BLM utility corridor to encompass the i-03 route.

SEGMENT*	LENGTH (MILES)	VRM CLASS	UTILITY CORRIDOR?	RMPA REQUIRED?	RMP AMENDMENT DESCRIPTION
i-04	10.5	III	Yes	Yes	Change the VRM from Class III to Class IV within the BLM utility corridor.
i-05	2.8	III	Yes	Yes	Change the VRM to Class IV within the BLM utility corridor.
i-06	7.2	III	Yes	Yes	Change the VRM from Class III to Class IV within the BLM utility corridor.
qn-02	10.8	III & IV	Yes - partial	Yes	Change to VRM Class IV 0.3-mile either side of centerline and establish ROW outside of utility corridor.
qs-01	3.1	III & IV	Yes - partial	Yes	Change to VRM Class IV 0.3-mile either side of centerline and establish ROW outside of utility corridor.
qs-02	4.8	IV	Yes - partial	Yes	Establish ROW in areas outside the utility corridor to encompass the qs-02 route and change to VRM Class IV within the BLM utility corridor.
x-01	4.7	II	No	Yes	Establish ROW outside of utility corridor.
x-02b	3.4	II	Yes - partial	Yes	Establish ROW outside of utility corridor.
x-03	5.6	III	Yes - partial	Yes	Establish ROW outside of utility corridor.
x-04	22.7	III	Yes - partial	Yes	Establish ROW outside of utility corridor.
x-05	10.2	III	Yes - partial	Yes	Establish ROW outside of utility corridor.
x-06	9.2	III	Yes - partial	Yes	Establish ROW outside of utility corridor and change to VRM Class IV 0.3-mile either side of segment centerline.
x-07	7.7	III	Yes	Yes	Change the VRM in areas of Class III to Class IV within the BLM utility corridor.

*Segment is only listed if an RMP Amendment is needed.

4.20.1.2 Lake Havasu RMP Amendment

Segment in-01 is the only segment located in the Lake Havasu FO. A portion of this segment crosses VRM Class II designated lands and would not conform to class objectives. An RMP amendment would be required to change the portion of this segment designated VRM Class II to Class IV within the BLM utility corridor crossing VRM Class II lands (Appendix 1, Figure 2.5-1).

4.20.1.3 Amendment Summary for the California Desert Conservation Area (CDCA) Plan of 1980 as Amended

The CDCA Plan as amended by the DRECP would apply to the Project under the Proposed Action and all full route alternatives.

Section II.4.2, Conservation and Management Action LUPA-BIO-PLANT-2 is proposed to be amended to state:

The CDCA Plan of 1980, as amended, would be further amended to authorize construction of the Ten West Link Project within 0.25-mile of occurrences of Harwood's eriastrum, provided that a Rare Plant Linear ROW Protection Plan for Harwood's eriastrum is developed and approved by the BLM California State Director. The Rare Plant Linear ROW Protection Plan would meet the DRECP goal of promotion of the ecological processes in the BLM Decision Area that sustain vegetation types of Focus and BLM Special Status Species and their habitat. The Rare Plant Linear ROW Protection Plan would have the objectives of:

- *Avoidance of take of Harwood's eriastrum individuals to the maximum extent practical; and*
- *Avoidance of impacts to Harwood's eriastrum suitable habitat to the maximum extent practical.*

BLM required BMPs contained in Appendix 2A would also apply and reduce the impacts of the Project on BLM special status plant species.

4.20.2 Environmental Impact Summary

The following tables provide a side-by-side comparison of impacts by zone, followed by a comparison of impacts by alternative route. In addition, a comparison of subalternatives by zone is provided.

4.20.3 Comparison of Impacts by Zone

Tables 4.20-3a-b, 4.20-4a-b, 4.20-5a-c, and 4.20-6a-d provide summaries of the impacts of each segment by zone.

Table 4.20-3a East Plains and Kofa Zone Comparison of Impacts by Segment – p and d Segments

CHARACTERISTIC OR RESOURCE IMPACT		p-01	p-02	p-03	p-04	p-05	p-06	d-01
Segment length (miles)		26.7	1.0	2.1	5.5	2.0	35.7	25.2
Land ownership (miles)	BLM	12.6	-	1.0	5.0	2.0	10.8	7.3
	Reclamation	-	-	-	-	-	-	-
	USFS	-	-	-	-	-	24.9	-
	Arizona State Trust	4.7	0.5	1.1	0.5	-	-	3.1
	Private	9.4	0.5	-	-	-	-	14.8
Ground disturbance	Short-term Acres	149.7	4.4	11.7	28.0	15.5	183.5	129.4
	Long-term Acres	67.8	3.6	7.2	19.0	7.0	125.1	88.1
Water Use	Total Gallons	33,990,049.3	262,294.4	537,341.9	1,411,655.2	515,264.6	9,238,767.2	31,952,762.7
BLM Yuma RMP conformance	VRM	Compliant	Compliant	Compliant	Compliant	Compliant	Amendment required	Compliant
	Corridors	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	RMP Conformance	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Plan conformance (Federal, county, municipal)	Plan Conformance	Yes	Yes	Yes	Yes	Yes	No - Not an appropriate use for Kofa NWR	Yes
Air Quality and Climate Change	Air Quality Emissions are proportional to the Proposed Action based on length of each segment. Due to the length of each segment, the impact of individual segments on air quality may be negligible to minor. However, the cumulative impact of all project segments might have large total emissions, but the emissions are distributed across a long linear area. Climate Change is not available at this smaller scale.							
Geology, Minerals, and Soil Resources	Geological Hazards Minerals/Mining (access to known resources or claims) Soils	Earthquake risk long-term negligible; no mapped active faults. No active mines; negligible short-term potential for preclusion of access; soil loss/erosion risk negligible to minor, short term to long term; adherence to APMs & BMPs reduces risks to negligible.	Same as p-01	Same as p-01	Same as p-01	Same as p-01	Same as p-01	Same as p-01
Paleontological Resources	Potential Fossil Yield Classification	Low to unknown	Low	Low to unknown	Low to unknown	Very low to unknown	Very low, unknown, and high	Low to unknown

CHARACTERISTIC OR RESOURCE IMPACT		p-01	p-02	p-03	p-04	p-05	p-06	d-01
Biological Resources (Vegetation Resources, Wildlife, including Special Status Species and Migratory Birds)	Loss of native habitat/communities; Noxious weeds; Special Status Species & animals); Increased risk of predation or electrocution re infrastructure; Displacement via construction; Displacement via human activity including recreation; Impacts to native habitat and designated management areas; and Migratory birds.	Segment already impacted by I-10, agriculture, transmission lines, and canal, so negligible additional impact. Temporary impact to desert bighorn sheep via avoidance of Big Horn Mountains #5 wildlife water and disruption of dispersal corridor between Burnt Mountain and Big Horn Mountains.	Additional disturbance would be indistinguishable from current conditions.	Additional disturbance would be indistinguishable from current conditions.	Permanent potential habitat degradation for Sonoran desert tortoise and other wildlife.		Potential temporary habitat alteration for Gila monster, elf owl, gilded flicker, LeConte's thrasher, and Lucy's warbler. Temporary disruption and desert bighorn sheep and Sonoran pronghorn. Permanent impact to desert bighorn sheep and Sonoran desert tortoise habitat. Golden eagle disturbance. Construction activities could have significant direct and indirect impacts on the management of Kofa NWR for wildlife. These impacts would be major, with both short- and long-term effects, and cannot be mitigated. The USFWS states the construction of a new transmission line across the Kofa NWR should not be considered as a viable alternative.	Areas already impacted by agriculture and development. Permanent habitat loss possible for Sonoran desert tortoise, Gila monster, and LeConte's thrasher could be lost. Permanent impact to 187 acres of desert vegetation and wildlife habitat.
Cultural Resources	Damage or loss of a cultural site or potential site under Federal or state registers; degradation of the setting for a cultural site where setting is significant to its listing eligibility; increased access leading to potential vandalism; disturbance of human remains	Known NRHP-eligible sites or sites requiring NRHP evaluation: 9 (cultural resources survey coverage: 46.7%). Known site density: 3.3 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 19. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 2 (cultural resources survey coverage: 13.5%). Known site density: 85.7 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 14. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from structures along this segment.	No previous Class III cultural resources survey has been conducted in the 200-foot analysis corridor. No sites have been recorded in the corridor. As a result, no meaningful evaluation of potential site density or direct effect can be made. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 3 (cultural resources survey coverage: 26.0%). Known site density: 23.3 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 12. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 2 (cultural resources survey coverage: 17.9%). Known site density: 24.8 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 11. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 17 (cultural resources survey coverage: 23.8%). Known site density: 8.3 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 71. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 2 (cultural resources survey coverage: 5.7%). Known site density: 5.7 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 35. One NRHP-listed site potentially sensitive to indirect visual impacts is within the indirect effects analysis area. Analysis of potential visual impacts to this historic property would be required as part of the indirect effects analysis.

CHARACTERISTIC OR RESOURCE IMPACT		p-01	p-02	p-03	p-04	p-05	p-06	d-01
Issues of Concern to Indian Tribes	Existing and new access, native infrastructure and the interconnection of the cultural and natural environment, places of elevated spiritual important to tribes, the Colorado River, the treatment of human remains, and the disturbance of previously pristine landscapes.	No known concerns to Indian tribes.	No known concerns to Indian tribes.	No known concerns to Indian tribes.	Native infrastructure and the interconnectedness of the cultural and natural environment.	Native infrastructure and the interconnectedness of the cultural and natural environment.	Native infrastructure and the interconnectedness of the cultural and natural environment; places of elevated spiritual importance.	Native infrastructure and the interconnectedness of the cultural and natural environment; places of elevated spiritual importance.
Land Use	Land use authorizations and ROWs; Residential; Agricultural; Other (i.e., nuisance impacts)	Minor, short-term effects to residential land during construction. Minor, long-term effects to residential land during operations.	Minor, short-term effects to residential land during construction. Minor, long-term effects to residential land during operations.	See Proposed Action and Alternatives 3, 1A, 2A, and 4A	See Proposed Action and Alternatives 3, 4, and 2A	See Proposed Action and Alternatives 4 and 3C	Same as p-01	Crosses more farmland than other segments and all of the NRCS-designated farmland in the East Plains and Kofa Zone (minor, short- and long-term effects).
Grazing and Rangeland	Access to range or improvements; Loss of range relative to AUMs; Fragmentation of allotments; Degradation of range quality	Two stock tanks to which access may be temporarily impeded during construction. Impact reduced to negligible with MM-GR-1.	See Proposed Action and Alternatives 3, 1A, 1B, 2A, and 4A	See Proposed Action and Alternatives 3, 1A, 2A, and 4A	See Proposed Action and Alternatives 3, 4, and 2A	See Proposed Action and Alternatives 4 and 3C	Same as p-01	One stock tank to which access may be temporarily impeded during construction. Impact reduced to negligible with MM-GR-1.
Recreation	Physical, access, use, or functional changes to established, designated, or planned recreation areas, resources, experiences, or activities; conflicts with Federal, state, or local policies; affect OHV designations, access, or routes; impacts to hunting access.	See Proposed Action and Alternatives 1, 2, 3, and 4A	See Proposed Action and Alternatives 3, 1A, 1B, 2A, and 4A	See Proposed Action and Alternatives 3, 1A, 2A, and 4A	See Proposed Action and Alternatives 3, 4, and 2A	See Proposed Action and Alternatives 4 and 3C	See Proposed Action	See Proposed Action and Alternatives 4, 2A, and 3A
Special Designations, Management Allocations, and Wilderness Resources	Conflict with goals, objectives & resources an area is designated to protect.	See Proposed Action and Alternatives 1, 2, 3, and 4A	See Proposed Action and Alternatives 3, 1A, 1B, 2A, and 4A	See Proposed Action and Alternatives 3, 1A, 2A, and 4A	See Proposed Action and Alternatives 3, 4, and 2A	See Proposed Action and Alternatives 4 and 3C	See Proposed Action	See Proposed Action and Alternatives 4, 2A, and 3A

CHARACTERISTIC OR RESOURCE IMPACT		p-01	p-02	p-03	p-04	p-05	p-06	d-01
Noise	Exceedance of regulations or guideline; exposure of receptors to excessive noise levels; generate noise levels that pose a health risk.	No NSR present. See Proposed Action and Alternatives 1, 2, 3, and 4A	No NSR present. See Proposed Action and Alternatives 3, 1A, 1B, 2A, and 4A	No NSR present. See Proposed Action and Alternatives 3, 1A, 2A, and 4A	No NSR present. See Proposed Action and Alternatives 3, 4, and 2A	No NSR present. See Proposed Action and Alternatives 4 and 3C.	No NSR present. See Proposed Action.	See Proposed Action and Alternatives 4, 2A, and 3A.
Hazards and Hazardous Materials	Generation, use, handling, or disturbance of hazardous waste that: violates Federal, state, or local laws or regulations; poses a health or safety risk to public or environment; releases hazardous emissions; creates a safety hazard to public or private airstrips; or exposes workers, schools, or the public to hazardous materials.	Negligible risk with adherence to Federal, state, and local laws and regulations; BMPs, APMs, and a HMMP; and the Hazardous Materials Mitigation Sequence.	Same as p-01	Same as p-01	Same as p-01	Same as p-01	Same as p-01	Same as p-01
Public Health and Safety	Risks to public health, safety, utilities; fire or electrocution hazard; EMF emissions	With worker education programs, adherence to BMPS and APMs, risks for adverse impacts would be negligible to minor for all receptors. Impacts to public health and safety due to EMF during operations would be long-term negligible to minor.	Same as p-01	Same as p-01	Same as p-01	Same as p-01	Same as p-01	Same as p-01
Socioeconomics & Environmental Justice	Not available at this scale							
Traffic and Transportation	Increased roadway traffic; damage to roadways, access, or road systems; risk to aviation.	All risks reduced to negligible to minor with adherence to APMs, BMPs, and MMs TT-1 and TT-2.	Same as p-01.	Same as p-01.	Same as p-01.	Same as p-01.	Same as p-01.	Same as p-01.

CHARACTERISTIC OR RESOURCE IMPACT		p-01	p-02	p-03	p-04	p-05	p-06	d-01
Visual Resources	Conflicts with visual standards, ordinances, or policies established; major and unmitigated visual changes that degrade or disrupt views of scenic landscapes from highly sensitive viewing locations; VRM class objectives that would not be met requiring an RMP Amendment.	Segment p-01 would conform to BLM VRM class objectives. The visual environment would benefit from changing the proposed guyed V structures to self-supporting lattice to match the existing DPV1 transmission infrastructure, which would reduce contrast and visual clutter. Minor addition to the view, marginally increasing the sense of development and visual clutter.	Same as p-01	Segment p-03 would conform to BLM VRM class objectives. Same as p-01.	Segment p-04 would conform to BLM VRM class objectives. Same as p-01.	Segment p-05 would conform to BLM VRM class objectives. Same as p-01.	Segment p-06 would conform to BLM VRM class objectives. Same as p-01.	Same as p-01
Water Resources	Impacts to surface water or groundwater quantity or availability; impediments to floodplain function from channel alterations; impacts to water rights or water quality; violations of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act.	Except where floodplains are too extensive to be spanned between structures impacts should be negligible using BMPs, APMs, or avoidance through design and placement of structures. Otherwise must comply with 404 permitting or Section 10 permitting to minimize impacts. Crossings of high risk floodplains associated with Centennial Wash, likely greater than a single span (negligible long-term effect).	Except where floodplains are too extensive to be spanned between structures impacts should be negligible using BMPs, APMs, or avoidance through design and placement of structures. Otherwise must comply with 404 permitting or Section 10 permitting to minimize impacts.	Same as p-02	Same as p-02	Same as p-02	Crossings of high risk floodplains associated with Bouse Wash, likely greater than a single span (negligible effect). Otherwise the same as p-02.	Crossings of high risk floodplains associated with Centennial Wash, likely greater than a single span (negligible effect). Otherwise the same as p-02.

Table 4.20-3b East Plains and Kofa Zone Comparison of Impacts by Segment – i and x Segments

CHARACTERISTIC OR RESOURCE IMPACT		i-01	i-02	i-03	i-04	in-01	x-01	x-02a	x-02b	x-03	x-04
Segment length (miles)		8.3	3.3	19.9	10.5	13.9	4.7	3.3	3.4	5.6	22.7
Land ownership (miles)	BLM	0.1	3.3	12.2	10.5	13.9	1.0	0.1	0.8	5.6	21.6
	Reclamation	0.1	-	-	-	-	-	-	-	-	-
	Arizona State Trust	5.3	-	6.2	-	-	3.7	3.2	2.6	-	1.1
	Private	2.8	-	1.5							
Ground disturbance	Short-term Acres	44.6	18.1	94.8	52.3	75.8	23.6	18.8	17.0	31.3	112.0
	Long-term Acres	25.7	12.2	65.8	49.7	50.5	16.6	11.3	11.8	19.6	78.5
Water Use	Total Gallons	2,124,991.9	848,345.8	5,126,049.8	2,766,815.2	3,677,114.6	1,221,136.8	826,991.7	869,739.2	1,440,066.3	5,793,160.9
BLM YFO or Lake Havasu (in-01 only) RMP conformance	VRM	Compliant	Compliant	Optional for ROW	Amendment required	Amendment required	Compliant	Compliant	Compliant	Compliant	Compliant
	Corridors	Yes	Yes	No (0.2 miles is outside)	Yes	Yes	No	Yes	No	No	No
	RMP Conformance	Yes	Yes	No	Yes	Yes	No	Yes	No	No	No
Other Plan conformance (Federal, county, municipal)	Plan Conformance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Air Quality and Climate Change	Air Quality Emissions are proportional to the Proposed Action based on length of each segment. Due to the length of each segment, the impact of individual segments on air quality may be negligible to minor. However, the cumulative impact of all project segments might have large total emissions, but the emissions are distributed across a long linear area. Climate Change is not available at this smaller scale.										
Geology, Minerals, and Soil Resources	Geological Hazards Minerals/Mining (access to known resources or claims) Soils	Earthquake risk long-term negligible; no mapped active faults. No active mines; negligible short-term potential for preclusion of access; soil loss/erosion risk negligible to minor, short term to long term; adherence to APMs & BMPs reduces risks to negligible.	Same as i-01	Same as i-01	Same as i-01	Same as i-01	Same as i-01	Same as i-01	Same as i-01	Same as i-01	Same as i-01
Paleontological Resources	Potential Fossil Yield Classification	Low	Low to unknown	Low to unknown	Very low to unknown	Very low to unknown	Low	Low	Low	Low	Low to unknown

CHARACTERISTIC OR RESOURCE IMPACT		i-01	i-02	i-03	i-04	in-01	x-01	x-02a	x-02b	x-03	x-04
Biological Resources (Vegetation Resources, Wildlife, including Special Status Species and Migratory Birds)	Loss of native habitat/communities; Noxious weeds; Special Status Species & animals); Increased risk of predation or electrocution re infrastructure; Displacement via construction; Displacement via human activity including recreation; Impacts to native habitat and designated management areas; and Migratory birds.	. Little additional effect from development of Project segments			Minimal Project impacts due to ongoing influence of I-10 on wildlife in the area.		Additional disturbance would be indistinguishable from current conditions	Additional disturbance would be indistinguishable from current conditions	Additional disturbance would be indistinguishable from current conditions	Minor disturbance and impacts to common wildlife species using Sonoran desert scrub habitat.	Temporary relocation of Gila monster, LeConte's thrasher, and kit fox using Sonoran desert scrub. Long-term impacts to biological resources associated with the Sonoran desert scrub.
Cultural Resources	Damage or loss of a cultural site or potential site under Federal or state registers; degradation of the setting for a cultural site where setting is significant to its listing eligibility; increased access leading to potential vandalism; disturbance of human remains	Known NRHP-eligible sites or sites requiring NRHP evaluation: 2 (cultural resources survey coverage: 21.2%). Known site density: 9.4 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 19. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from	No previous Class III cultural resources survey has been conducted in the 200-foot analysis corridor. No sites have been recorded in the corridor. As a result, no meaningful evaluation of potential site density or direct effect can be made. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic	Known NRHP-eligible sites or sites requiring NRHP evaluation: 4 (cultural resources survey coverage: 4.2%). Known site density: 19.4 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 95. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.	Only 2.0 percent of the 200-foot analysis corridor has been subjected to Class III survey. No sites have been recorded in the corridor. As a result, no meaningful evaluation of potential site density or direct effect can be made. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from	Known NRHP-eligible sites or sites requiring NRHP evaluation: 2 (cultural resources survey coverage: 2.0%). Known site density: 30.3 sites per 100 acres[1]. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 102. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 2.0%). Known site density: 100.0 sites per 100 acres[1]. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 0. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from	No previous Class III cultural resources survey has been conducted in the 200-foot analysis corridor. No sites have been recorded in the corridor. As a result, no meaningful evaluation of potential site density or direct effect can be made. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from	Only 4.4 percent of the 200-foot analysis corridor has been subjected to Class III survey. No sites have been recorded in the corridor. As a result, no meaningful evaluation of potential site density or direct effect can be made. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.	Only 1.7 percent of the 200-foot analysis corridor has been subjected to Class III survey. No sites have been recorded in the corridor. As a result, no meaningful evaluation of potential site density or direct effect can be made. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 1 (cultural resources survey coverage: 4.4%). Known site density: 14.1 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 23. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.

CHARACTERISTIC OR RESOURCE IMPACT		i-01	i-02	i-03	i-04	in-01	x-01	x-02a	x-02b	x-03	x-04
		structures along this segment.	properties from structures along this segment.		structures along this segment.		structures along this segment.	structures along this segment.			
Issues of Concern to Indian Tribes	Existing and new access, native infrastructure and the interconnection of the cultural and natural environment, places of elevated spiritual important to tribes, the Colorado River, the treatment of human remains, and the disturbance of previously pristine landscapes.	No known concerns to Indian tribes.	No known concerns to Indian tribes.	Native infrastructure and the interconnectedness of the cultural and natural environment	No known concerns to Indian tribes	No known concerns to Indian tribes	No known concerns to Indian tribes	Native infrastructure and the interconnectedness of the cultural and natural environment	Native infrastructure and the interconnectedness of the cultural and natural environment	Native infrastructure and the interconnectedness of the cultural and natural environment	Native infrastructure and the interconnectedness of the cultural and natural environment regarding new access and intrusion on pristine landscapes; Intrusion on pristine landscape
Land Use	Land use authorizations and ROWs; Residential; Agricultural; Other (i.e., nuisance impacts)	Crosses state trust land (minor to moderate, long-term effect). Crosses the CAP but would not infringe on the utility.	Does not cross residential land; crosses state trust land (minor to moderate, long-term effect).	Crosses state trust land (minor to moderate, long-term effect). Crosses the CAP but would not infringe on the utility.	Does not cross residential land	Does not cross residential land	Crosses state trust land (minor to moderate, long-term effect).	Crosses state trust land (minor to moderate, long-term effect).	Crosses state trust land (minor to moderate, long-term effect).	Does not cross residential land	Crosses state trust land (minor to moderate, long-term effect).
Grazing and Rangeland	Access to range or improvements; Loss of range relative to AUMs; Fragmentation of allotments; Degradation of range quality	One stock tank to which access may be temporarily impeded during construction. Impact reduced to negligible with MM-GR-1.	None	None	None	None	One stock tank to which access may be temporarily impeded during construction. Impact reduced to negligible with MM-GR-1.	None	None	None	None

CHARACTERISTIC OR RESOURCE IMPACT		i-01	i-02	i-03	i-04	in-01	x-01	x-02a	x-02b	x-03	x-04
Recreation	Physical, access, use, or functional changes to established, designated, or planned recreation areas, resources, experiences, or activities; conflicts with Federal, state, or local policies; affect OHV designations, access, or routes; impacts to hunting access.	See Alternatives 1, 2, and 3B	See Alternatives 1, 2, 3A, and 3B	See Alternatives 1, 2, 3, and 4B	See Alternatives 1, 2, 3, and 4C	See Alternatives 4, 1C and 3D	See Alternative 1B	See Alternatives 1A, 1B, 2A, and 3A	See Alternatives 1A, 2A, and 3A	See Alternatives 3, 2A, 4B	See Alternatives 4 and 3C
Special Designations, Management Allocations, and Wilderness Resources	Conflict with goals, objectives & resources an area is designated to protect	See Alternatives 1, 2, and 3B	See Alternatives 1, 2, 3A, and 3B	See Alternatives 1, 2, 3, and 4B	See Alternatives 1, 2, 3, and 4C	Negligible loss of acreage to lands with wilderness characteristics Polygon 34	See Alternative 1B	See Alternatives 1A, 1B, 2A, and 3A	See Alternatives 1A, 2A, and 3A	See Alternatives 3, 2A, 4B	See Alternatives 4 and 3C
Noise	Exceedance of regulations or guideline; exposure of receptors to excessive noise levels; generate noise levels that pose a health risk.	No NSR present. See Alternatives 1, 2, and 3B	No NSR present. See Alternatives 1, 2, 3A, and 3B	No NSR present. See Alternatives 1, 2, 3, and 4B	No NSR present. See Alternatives 1, 2, 3, and 4C	No NSR present. See Alternatives 4, 1C, and 3D	No NSR present. See Alternative 1B	No NSR present. See Alternatives 1A, 1B, 2A, and 3A	No NSR present. See Alternatives 1A, 2A, and 3A	No NSR present. See Alternatives 3, 2A, 4B	No NSR present. See Alternatives 4 and 3C
Hazards and Hazardous Materials	Generation, use, handling, or disturbance of hazardous waste that: violates Federal, state, or local laws or regulations; poses a health or safety risk to public or environment; releases hazardous emissions; creates a safety hazard to public or private airstrips; or exposes workers, schools, or the public to hazardous materials.	Negligible risk with adherence to Federal, state, and local laws and regulations; BMPs, APMs, and a HMMP; and the Hazardous Materials Mitigation Sequence.	Same as i-01	Same as i-01	Same as i-01	Same as i-01	Same as i-01	Same as i-01	Same as i-01	Same as i-01	Same as i-01

CHARACTERISTIC OR RESOURCE IMPACT		i-01	i-02	i-03	i-04	in-01	x-01	x-02a	x-02b	x-03	x-04
Public Health and Safety	Risks to public health, safety, utilities; fire or electrocution hazard; EMF emissions	With worker education programs, adherence to BMPS and APMs, risks for adverse impacts would be negligible to minor for all receptors. Impacts to public health and safety due to EMF during operations would be long-term negligible to minor.	Same as i-01	Same as i-01	Same as i-01	Same as i-01	Same as i-01	Same as i-01	Same as i-01	Same as i-01	Same as i-01
Socioeconomics & Environmental Justice	Not available at this scale										
Traffic and Transportation	Increased roadway traffic; damage to roadways, access, or road systems; risk to aviation	All risks reduced to negligible to minor with adherence to APMs, BMPs, and MMs TT-1 and TT-2.	Same as i-01	Same as i-01	Same as i-01. Safety risk to AGFD aerial surveys reduced to minor by MM-TT-02.	Same as i-01. Safety risk to AGFD aerial surveys reduced to minor by MM-TT-02.	Same as i-01	Same as i-01	Same as i-01	Same as i-01	Same as i-01
Visual Resources	Conflicts with visual standards, ordinances, or policies established; major and unmitigated visual changes that degrade or disrupt views of scenic landscapes from highly sensitive viewing locations; VRM class objectives that would not be met requiring an RMP Amendment.	Same as p-01	Segment i-02 would conform to BLM VRM class objectives. Same as p-01.	Segment i-03 would conform to BLM VRM class objectives. Same as p-01. Should some combination of Segments i-03, i-04, and/or x-04 be part of the selected alternative, the Alt. SCS location would be used. The segments and Alt. SCS site would moderately contrast with the existing setting	OHV users would be in close proximity to the Project. Guyed V structures would pose an unacceptable human health and safety risk to OHV users; self-supporting lattice structures or monopoles would replace the guyed V structures as mitigation to eliminate the hazards. Level of development	The Project along the portion of in-01 within the YFO would outsize surrounding landforms and be a major modification that dominates the view; an amendment of the Yuma RMP to change the VRM class from III to IV would ensure conformance. The portion within the Lake Havasu FO	Segment x-01 would conform to BLM VRM class objectives. Same as p-01.	Segment x-02a would conform to BLM VRM class objectives. Same as p-01.	Segment x-02b would conform to BLM VRM class objectives. Same as p-01.	Segment x-03 would conform to BLM VRM class objectives. Same as p-01.	Segment x-04 would conform to BLM VRM class objectives. Same as p-01. See i-03 for Alt. SCS.

CHARACTERISTIC OR RESOURCE IMPACT		i-01	i-02	i-03	i-04	in-01	x-01	x-02a	x-02b	x-03	x-04
				but would not be dominant in views. The Alt. SCS would conform with VRM class objectives.	would be a major modification to the visual environment and dominate the view. VRM Class III objectives would not be met. See i-03 for Alt. SCS.	would cross lands designated VRM Class II and VRM Class IV. It would not meet VRM Class II objectives. An amendment of the Lake Havasu RMP would be required.					
Water Resources	Impacts to surface water or groundwater quantity or availability; impediments to floodplain function from channel alterations; impacts to water rights or water quality; violations of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act.	Except where floodplains are too extensive to be spanned between structures impacts should be long-term negligible using BMPs, APMs, or avoidance through design and placement of structures. Otherwise must comply with 404 permitting or Section 10 permitting to minimize impacts.	Same as i-01	Crossings of high risk floodplains associated with Bouse Wash, likely greater than a single span (negligible effect). Otherwise the same as i-01.	Same as i-01	Same as i-01	Same as i-01	Same as i-01	Same as i-01	Same as i-01	Crossings of high risk floodplains associated with Bouse Wash, likely greater than a single span (negligible effect). Otherwise the same as i-01.

[1]Site density calculations include sites that have been previously determined or recommended as ineligible for the NRHP. In cases where the projected counts of NRHP-eligible sites or sites of unknown NRHP eligibility are 0 and the site density is greater than 0, the site density calculation includes NRHP-ineligible sites.

Table 4.20-4a Quartzsite Zone Comparison of Impacts by Segment – p and i Segments, and qn-01 and 02

CHARACTERISTIC OR RESOURCE IMPACT		p-07	p-08	i-05	qn-01	qn-02
Segment length (miles)		2.2	0.6	2.8	0.6	10.8
Land ownership (miles)	BLM	2.2	0.6	2.8	0.6	9.8
	Reclamation	-	-	-	-	
	Arizona State Trust	-	-	-	-	1.0
	Private	-	-	-	-	
Ground disturbance	Short-term Acres	12.8	2.7	10.4	4.2	58.2
	Long-term Acres	10.6	4.0	17.4	2.2	438.3
Water Use	Total Gallons	548,777.3	153,576.5	733,578.7	164,093.0	2,796,454.8
BLM Yuma RMP conformance	VRM	Amendment required	Amendment required	Compliant	Compliant	Compliant
	Corridors	Yes	Yes	Yes	Yes	No
	RMP Conformance	Yes	Yes	Yes	Yes	No
Other Plan conformance (Federal, county, municipal)	Plan Conformance	Yes	Yes	Yes	Yes	No – crosses a Tier III growth area, LTVA, and designated 14-day camping area (Town of Quartzsite General Plan)
Air Quality and Climate Change	Air Quality Emissions are proportional to the Proposed Action based on length of each segment. Due to the length of each segment, the impact of individual segments on air quality may be negligible to minor. However, the cumulative impact of all project segments might have large total emissions, but the emissions are distributed across a long linear area. Climate Change is not available at this smaller scale.					
Geology, Minerals, and Soil Resources	Geological Hazards Minerals/Mining (access to known resources or claims) Soils	Earthquake risk long-term negligible; no mapped active faults. No active mines; negligible short-term potential for preclusion of access; soil loss/erosion risk negligible to minor, short term to long term; adherence to APMs & BMPs reduces risks to negligible.	Same as p-07	Same as p-07	Same as p-07	Same as p-07
Paleontological Resources	Potential Fossil Yield Classification	Unknown	Unknown	Unknown	Unknown	Very low to unknown

CHARACTERISTIC OR RESOURCE IMPACT		p-07	p-08	i-05	qn-01	qn-02
Biological Resources (Vegetation Resources, Wildlife, including Special Status Species and Migratory Birds)	Loss of native habitat/communities; Noxious weeds; Special Status Species & animals); Increased risk of predation or electrocution re infrastructure; Displacement via construction; Displacement via human activity including recreation; Impacts to native habitat and designated management areas; and Migratory birds.	No new impacts to biological resources		Additional disturbance associated with the Project would be indistinguishable from current conditions.		Localized site-specific impacts where farthest from human activities to common wildlife species, Gila monster, LeConte's thrasher, kit fox, various desert amphibians, and Lucy's warbler.
Cultural Resources	Damage or loss of a cultural site or potential site under Federal or state registers; degradation of the setting for a cultural site where setting is significant to its listing eligibility; increased access leading to potential vandalism; disturbance of human remains	Known NRHP-eligible sites or sites requiring NRHP evaluation: 5 (cultural resources survey coverage: 14.6%). Known site density: 34.2 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 18. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 5.6%). Known site density: 17.9 sites per 100 acres[1]. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 0. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 1 (cultural resources survey coverage: 36.3%). Known site density: 4.0 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 3. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 2 (cultural resources survey coverage: 89.6%). Known site density: 22.2 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 2. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 4 (f cultural resources survey coverage: 56.6%). Known site density: 4.7 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 7. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment
Issues of Concern to Indian Tribes	Existing and new access, native infrastructure and the interconnection of the cultural and natural environment, places of elevated spiritual important to tribes, the Colorado River, the treatment of human remains, and the disturbance of previously pristine landscapes.	Native infrastructure and the interconnectedness of the cultural and natural environment	No known concerns to Indian tribes.	No known concerns to Indian tribes.	No known concerns to Indian tribes.	Places of elevated spiritual importance.
Land Use	Land use authorizations and ROWs; Residential; Agricultural; Other (i.e., nuisance impacts)	See Proposed Action and Alternatives 3 and 4D	See Proposed Action and Alternatives 3 and 4	See Alternatives 1, 2, 3J, and 4J	See Alternatives 4, 1D, 3G	Contains residential land; crosses Tier III growth area (minor. long-term impact). Crosses State land (negligible to minor, long-term impact).

CHARACTERISTIC OR RESOURCE IMPACT		p-07	p-08	i-05	qn-01	qn-02
Grazing and Rangeland	Access to range or improvements; Loss of range relative to AUMs; Fragmentation of allotments; Degradation of range quality	See Proposed Action and Alternatives 3 and 4D	See Proposed Action and Alternatives 3 and 4	See Alternatives 1, 2, 3J, and 4J	See Alternatives 4, 1D, 3G	See Alternative 3H
Recreation	Physical, access, use, or functional changes to established, designated, or planned recreation areas, resources, experiences, or activities; conflicts with Federal, state, or local policies; affect OHV designations, access, or routes; impacts to hunting access.	See Proposed Action and Alternatives 3 and 4D	See Proposed Action and Alternatives 3 and 4	See Alternatives 1, 2, 3J, and 4J	See Alternatives 4, 1D, 3G	Crosses La Posa LTVA and Dome Rock Camping Area (moderate to major, long-term effect).
Special Designations, Management Allocations, and Wilderness Resources	Conflict with goals, objectives & resources an area is designated to protect	See Proposed Action and Alternatives 3 and 4D	See Proposed Action and Alternatives 3 and 4	See Alternatives 1, 2, 3J, and 4J	See Alternatives 4, 1D, 3G	Negligible loss of acreage to lands with wilderness characteristics Polygon 35_SW
Noise	Exceedance of regulations or guideline; exposure of receptors to excessive noise levels; generate noise levels that pose a health risk.	No NSR present. See Proposed Action and Alternatives 3 and 4D	No NSR present. See Proposed Action and Alternatives 3 and 4	No NSR present. See Alternatives 1, 2, 3J, and 4J	No NSR present. See Alternatives 4, 1D, 3G	80 NSR are present, including residences and Quartzsite Alliance Church in Quartzsite. See Alternative 3H.
Hazards and Hazardous Materials	Generation, use, handling, or disturbance of hazardous waste that: violates Federal, state, or local laws or regulations; poses a health or safety risk to public or environment; releases hazardous emissions; creates a safety hazard to public or private airstrips; or exposes workers, schools, or the public to hazardous materials.	Negligible risk with adherence to Federal, state, and local laws and regulations; BMPs, APMs, and a HMMP; and the Hazardous Materials Mitigation Sequence.	Same as p-07	Same as p-07	Same as p-07	Same as p-07
Public Health and Safety	Risks to public health, safety, utilities; fire or electrocution hazard; EMF emissions	With worker education programs, adherence to BMPS and APMs, risks for adverse impacts would be negligible to minor for all receptors. Impacts to public health and safety due to EMF during operations would be long-term negligible to minor.	Same as p-07	Same as p-07	Same as p-07	Same as p-07

CHARACTERISTIC OR RESOURCE IMPACT		p-07	p-08	i-05	qn-01	qn-02
Socioeconomics & Environmental Justice	Not available at this scale					
Traffic and Transportation	Increased roadway traffic; damage to roadways, access, or road systems; risk to aviation	All traffic and transportation risks reduced to negligible to minor with adherence to APMs, BMPs, and MMs TT-1 and TT-2.	Same as p-07	Same as p-07	Same as p-07	Same as p-07
Visual Resources	Conflicts with visual standards, ordinances, or policies established; major and unmitigated visual changes that degrade or disrupt views of scenic landscapes from highly sensitive viewing locations; VRM class objectives that would not be met requiring an RMP Amendment.	Because guyed V structures would pose an unacceptable human health and safety risk to OHV users, self-supporting lattice structures or monopoles would replace the guyed V structures as mitigation to eliminate the hazards associated with guy wires. Level of development would be a major modification to the visual environment and dominate the view. Thus, VRM Class III objectives would not be met. Because of the presence of the large self-supporting lattice structures of the DPV1 transmission line, the addition of the Project structures would be a relatively minor addition.	Same as p-07	Same as p-07	VRM Class III objectives would not be met	Segment qn-02 would conform to BLM VRM class objectives. Moderate to major impact on views of private landowners in this area.
Water Resources	Impacts to surface water or groundwater quantity or availability; impediments to floodplain function from channel alterations; impacts to water rights or water quality; violations of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act.	Except where floodplains are too extensive to be spanned between structures impacts should be long-term negligible using BMPs, APMs, or avoidance through design and placement of structures. Otherwise must comply with 404 permitting or Section 10 permitting to minimize impacts.	Same as p-07	Same as p-07	Same as p-07	Same as p-07

[1]Site density calculations include sites that have been previously determined or recommended as ineligible for the NRHP. In cases where the projected counts of NRHP-eligible or site of unknown NRHP eligibility are 0 and the site density is greater than 0, the site density calculation includes NRHP ineligible sites.

Table 4.20-4b Quartzsite Zone Comparison of Impacts by Segment – qs and x Segments

CHARACTERISTIC OR RESOURCE IMPACT		qs-01	qs-02	x-05	x-06	x-07
Segment length (miles)		3.1	4.8	10.2	9.2	7.7
Land ownership (miles)	BLM	3.1	4.8	10.2	9.2	7.7
	Reclamation	-	-	-	-	-
	Arizona State Trust	-	-	-	-	-
	Private	-	-	-	-	-
Ground disturbance	Short-term Acres	16.6	28.6	55.5	51.4	40.8
	Long-term Acres	10.7	38.3	46.2	50.8	27.0
Water Use	Total Gallons	799,636.3	1,253,183.4	2,620,125.5	2,420,790.9	1,989,899.2
BLM Yuma RMP conformance	VRM	Amendment required	Amendment required	Compliant	Amendment required	Amendment required
	Corridors	Partial	Partial	No	No	Yes
	RMP Conformance	No	No	No	No	Yes
Other Plan conformance (Federal, county, municipal)	Plan Conformance	No – crosses an LTVA and designated 14-day camping area (Town of Quartzsite General Plan)	No – crosses an LTVA and designated 14-day camping area (Town of Quartzsite General Plan)	Yes	Yes	No – crosses an LTVA and designated 14-day camping area (Town of Quartzsite General Plan)
Air Quality and Climate Change	Air Quality Emissions are proportional to the Proposed Action based on length of each segment. Due to the length of each segment, the impact of individual segments on air quality may be negligible to minor. However, the cumulative impact of all project segments might have large total emissions, but the emissions are distributed across a long linear area. Climate Change is not available at this smaller scale.					
Geology, Minerals, and Soil Resources	Geological Hazards Minerals/Mining (access to known resources or claims) Soils	Earthquake risk long-term negligible; no mapped active faults. No active mines; negligible short-term potential for preclusion of access; Soil loss/erosion risk negligible to minor, short term to long term; adherence to APMs & BMPs reduces risks to negligible. Negligible disruption of sand transport or dunes during construction and operation.	Same as qs-01	Same as qs-01	Same as qs-01	Same as qs-01
Paleontological Resources	Potential Fossil Yield Classification	Unknown	Very low to unknown	Very low to unknown	Unknown	Unknown

CHARACTERISTIC OR RESOURCE IMPACT		qs-01	qs-02	x-05	x-06	x-07
Biological Resources (Vegetation Resources, Wildlife, including Special Status Species and Migratory Birds)	Loss of native habitat/communities; Noxious weeds; Special Status Species & animals); Increased risk of predation or electrocution re infrastructure; Displacement via construction; Displacement via human activity including recreation; Impacts to native habitat and designated management areas; and Migratory birds.	Additional disturbance associated with the Project would be indistinguishable from current conditions.		Golden eagle, Gila monster, elf owl, gilded flicker, and Lucy's warbler maybe impacted by segment development.	Due to existing development the Project would have minimal impact on wildlife species in these segments.	
Cultural Resources	Damage or loss of a cultural site or potential site under Federal or state registers; degradation of the setting for a cultural site where setting is significant to its listing eligibility; increased access leading to potential vandalism; disturbance of human remains.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 94. %1). Known site density: 0.0 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 0. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 1 (cultural resources survey coverage: 38.4%). Known site density: 11.0 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 3. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 1 (cultural resources survey coverage: 1.0%). Known site density: 41.7 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 104. Due to the low percentage sample of existing survey coverage, the projected number of sites may be misrepresented. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 5 (cultural resources survey coverage: 23.7%). Known site density: 11.2 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 21. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 1 (cultural resources survey coverage: 15.4%). Known site density: 32.5 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 6. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.
Issues of Concern to Indian Tribes	Existing and new access, native infrastructure and the interconnection of the cultural and natural environment, places of elevated spiritual important to tribes, the Colorado River, the treatment of human remains, and the disturbance of previously pristine landscapes.	Native infrastructure and the interconnectedness of the cultural and natural environment.	Places of elevated spiritual importance.	Native infrastructure and the interconnectedness of the cultural and natural environment; intrusion on pristine landscapes.	Native infrastructure and the interconnectedness of the cultural and natural environment.	Trails have been recorded on or within 0.5- mile of Segment x-07. Trails are of significance to Indian tribes as part of traditional native infrastructure associated with the interconnectedness of the cultural and natural environment.

CHARACTERISTIC OR RESOURCE IMPACT		qs-01	qs-02	x-05	x-06	x-07
Land Use	Land use authorizations and ROWs; Residential; Agricultural; Other (i.e., nuisance impacts)	Minor, short-term effects to residential land during construction. Minor, long-term effects to residential land during operations.	Minor, short-term effects to residential land during construction. Minor, long-term effects to residential land during operations.	See Alternatives 3 and 4D	See Alternatives 4 and 3F	See Alternatives 2 and 3E
Grazing and Rangeland	Access to range or improvements; Loss of range relative to AUMs; Fragmentation of allotments; Degradation of range quality	See Alternatives 1, 2, and 3E	See Alternative 1	See Alternatives 3 and 4D	See Alternatives 4 and 3F	See Alternatives 2 and 3E
Recreation	Physical, access, use, or functional changes to established, designated, or planned recreation areas, resources, experiences, or activities; conflicts with Federal, state, or local policies; affect OHV designations, access, or routes; impacts to hunting access.	Crosses La Posa LTVA and Dome Rock Camping Area (moderate to major, long-term effect).	Crosses La Posa LTVA and Dome Rock Camping Area (moderate to major, long-term effect).	See Alternatives 3 and 4D	See Alternatives 4 and 3F	Crosses La Posa LTVA and Dome Rock Camping Area (moderate to major, long-term effect).
Special Designations, Management Allocations, and Wilderness Resources	Conflict with goals, objectives & resources an area is designated to protect	See Alternatives 1, 2, and 3E	See Alternative 1	See Alternatives 3 and 4D	See Alternatives 4 and 3F	See Alternatives 2 and 3E
Noise	Exceedance of regulations or guideline; exposure of receptors to excessive noise levels; generate noise levels that pose a health risk.	251 NSR are present, including residences including La-Z Daze Trailer Park, Rice Ranch RV Park, Church of Jesus Christ of Latter-Day Saints, and LTVAs in Quartzsite.	54 NSR present, including residences associated with the Desert Gardens RV Park and Super 8 Hotel.	No NSR present. See Alternatives 3 and 4D	Variable NSR; thousands per year as it is adjacent to La Posa LTVA. See Alternatives 4 and 3F	Variable NSR; thousands per year as it is through La Posa LTVA. See Alternatives 2 and 3E
Hazards and Hazardous Materials	Generation, use, handling, or disturbance of hazardous waste that: violates Federal, state, or local laws or regulations; poses a health or safety risk to public or environment; releases hazardous emissions; creates a safety hazard to public or private airstrips; or exposes workers, schools, or the public to hazardous materials.	Negligible risk with adherence to Federal, state, and local laws and regulations; BMPs, APMs, and a HMMP; and the Hazardous Materials Mitigation Sequence.	Same as qs-01	Same as qs-01	Same as qs-01	Same as qs-01

CHARACTERISTIC OR RESOURCE IMPACT		qs-01	qs-02	x-05	x-06	x-07
Public Health and Safety	Risks to public health, safety, utilities; fire or electrocution hazard; EMF emissions	With worker education programs, adherence to BMPS and APMs, risks for adverse impacts would be negligible to minor for all receptors. Impacts to public health and safety due to EMF during operations would be long-term negligible to minor.	Same as qs-01	Same as qs-01	Same as qs-01	Same as qs-01
Socioeconomics & Environmental Justice	Not available at this scale					
Traffic and Transportation	Increased roadway traffic; damage to roadways, access, or road systems; risk to aviation	All traffic and transportation risks reduced to negligible to minor with adherence to APMs, BMPs, and MMs TT-1 and TT-2.	Same as qs-01	Same as qs-01	Same as qs-01	Same as qs-01
Visual Resources	Conflicts with visual standards, ordinances, or policies established; major and unmitigated visual changes that degrade or disrupt views of scenic landscapes from highly sensitive viewing locations; VRM class objectives that would not be met requiring an RMP Amendment.	Existing infrastructure begins to outsize the surrounding landscape features and dominate the view, and the Project would add to visual clutter. Guyed V structures would be replaced with monopoles to eliminate potential hazards to OHV recreation and reduce the contrast between the Project and the existing WAPA 161kV monopole structures. With monopole structures, it would have a moderate to major impact to the views of RV park residents by increasing the sense of development and visual clutter.	Guyed V structures would be replaced with monopoles to eliminate potential hazards to OHV recreation and reduce the visual clutter of the guy wires in the view. With monopole structures, it would have a negligible to minor impact to the views of RV park residents as the vertical structures would blend well with the other single pole vertical elements in the view.	Segment x-05 would conform to BLM VRM class objectives.	VRM Class III objectives would not be met. Segment x-06 would be primarily viewed from within the LTVA; as well as the access road paralleling the DPV1 or other OHV routes east of SR 95 and the LTVA. Views would be most impacted from the outer eastern edge of the LTVA. The Project would be a major modification to the visual environment.	VRM Class III objectives would not be met. Same as Segment x-06.
Water Resources	Impacts to surface water or groundwater quantity or availability; impediments to floodplain function from channel alterations; impacts to water rights or water quality; violations of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act.	Except where floodplains are too extensive to be spanned between structures impacts should be long-term negligible using BMPs, APMs, or avoidance through design and placement of structures. Otherwise must comply with 404 permitting or Section 10 permitting to minimize impacts.	Crossings of high risk floodplains associated with La Cholla Wash, likely greater than a single span (negligible effect). Otherwise the same as qs-01.	Same as qs-01	Same as qs-01	Same as qs-01

Table 4.20-5a Copper Bottom Zone Comparison of Impacts by Segment – p Segments

CHARACTERISTIC OR RESOURCE IMPACT		p-09	p-10	p-11	p-12	p-13	p-14
Segment length (miles)		6.9	1.1	4.1	2.5	3.5	0.9
Land ownership (miles)	BLM	6.7	1.1	4.1	1.1	3.5	0.9
	Reclamation	-	-	<0.1	1.4	-	-
	Arizona State Trust	-	-	-	-	-	-
	DOD	0.2	-	-	-	-	-
	Private	-	-	-	-	-	-
Ground disturbance	Short-term Acres	37.1	14.0	40.5	11.1	16.1	6.1
	Long-term Acres	23.1	13.7	34.0	18.2	19.2	4.5
Water Use	Total Gallons	1,790,525.3	293,285.2	1,100,516.7	647,095.6	916,230.6	236,111.5
BLM Yuma RMP conformance	VRM	Amendment required	Amendment required	Amendment required	Amendment required	Amendment required	Compliant
	Corridors	Yes	Yes	Yes	Yes	Yes	Yes
	RMP Conformance	Yes	Yes	Yes	Yes	Yes	Yes
Other Plan conformance (Federal, county, municipal)	Plan Conformance	Yes	Yes	Yes	Yes	Yes	Yes
Air Quality and Climate Change	Air Quality Emissions are proportional to the Proposed Action based on length of each segment. Due to the length of each segment, the impact of individual segments on air quality may be negligible to minor. However, the cumulative impact of all project segments might have large total emissions, but the emissions are distributed across a long linear area. Climate Change is not available at this smaller scale.						
Geology, Minerals, and Soil Resources	Geological Hazards Minerals/Mining (access to known resources or claims) Soils	Earthquake risk long-term negligible; no mapped active faults. No active mines; negligible short-term potential for preclusion of access; Soil loss/erosion risk negligible to minor, short term to long term; adherence to APMs & BMPs reduces risks to negligible. Negligible disruption of sand transport or dunes during construction and operation.	Same as p-09	Same as p-09	Same as p-09	Same as p-09	Same as p-09
Paleontological Resources	Potential Fossil Yield Classification	High to unknown	Very low to high	Very low	Very low to unknown	Unknown	Unknown

CHARACTERISTIC OR RESOURCE IMPACT		p-09	p-10	p-11	p-12	p-13	p-14
Biological Resources (Vegetation Resources, Wildlife, including Special Status Species and Migratory Birds)	Loss of native habitat/communities; Noxious weeds; Special Status Species & animals); Increased risk of predation or electrocution re infrastructure; Displacement via construction; Displacement via human activity including recreation; Impacts to native habitat and designated management areas; and Migratory birds.	The impacts of Project development would be additive to the existing habitat fragmentation for Lucy's warblers and desert toads through the narrow Copper Bottom Pass.		The impacts of Project development would be additive to the existing habitat fragmentation for desert bighorn sheep through the narrow Copper Bottom Pass.	Project development would add disturbance to a remote area in very harsh desert conditions with large areas of desert pavement.		
Cultural Resources	Damage or loss of a cultural site or potential site under Federal or state registers; degradation of the setting for a cultural site where setting is significant to its listing eligibility; increased access leading to potential vandalism; disturbance of human remains	Known NRHP-eligible sites or sites requiring NRHP evaluation: 2 (cultural resources survey coverage: 77.4%). Known site density: 1.5 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 3. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 1 (cultural resources survey coverage: 62.9%). Known site density: 5.6 sites per 100 acres[1]. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 2. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 2 (cultural resources survey coverage: 61.4%). Known site density: 3.3 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 3. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 9.8%). Known site density: 0.0 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 0. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 2 (cultural resources survey coverage: 97.5%). Known site density: 7.3 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 2. An NRHP-eligible intaglio site has been recorded within the 200-foot analysis corridor. Analysis of potential visual impacts to this historic property would be required as part of the indirect effects analysis.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 75.2%). Known site density: 23.1 sites per 100 acres[1]. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 0. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from structures along this segment.
Issues of Concern to Indian Tribes	Existing and new access, native infrastructure and the interconnection of the cultural and natural environment, places of elevated spiritual important to tribes, the Colorado River, the treatment of human remains, and the disturbance of previously pristine landscapes.	Native infrastructure and the interconnectedness of the cultural and natural environment.	Native infrastructure and the interconnectedness of the cultural and natural environment.	Native infrastructure and the interconnectedness of the cultural and natural environment.	Native infrastructure and the interconnectedness of the cultural and natural environment.	Native infrastructure and the interconnectedness of the cultural and natural environment; places of elevated spiritual importance.	Native infrastructure and the interconnectedness of the cultural and natural environment.
Land Use	Land use authorizations and ROWs; Residential; Agricultural; Other (i.e., nuisance impacts)	See Proposed Action and Alternatives 2, 3, and 4	See Proposed Action and Alternatives 2, 4, and 3K	Crosses CRIT land (would require an easement)	See Proposed Action and Alternatives 2, 3L, and 4G	See Proposed Action and Alternatives 2, 4, and 3L	See Proposed Action and Alternatives 2, 3, and 4

CHARACTERISTIC OR RESOURCE IMPACT		p-09	p-10	p-11	p-12	p-13	p-14
Grazing and Rangeland	Access to range or improvements; Loss of range relative to AUMs; fragmentation of allotments Degradation of range quality	Negligible to minor short-term disturbance to WHB and livestock from helicopters; potential fugitive dust effects to grazing forage in the vicinity of the fly yard. See Proposed Action and Alternatives 2, 3, and 4	Negligible to minor short-term disturbance to WHB and livestock from helicopters; potential fugitive dust effects to grazing forage in the vicinity of the fly yard. See Proposed Action and Alternatives 2, 4, and 3K	Negligible to minor short-term disturbance to WHB and livestock from helicopters; potential fugitive dust effects to grazing forage in the vicinity of the fly yard. See Proposed Action and Alternatives 2 and 4G	See Proposed Action and Alternatives 2, 3L, and 4G	See Proposed Action and Alternatives 2, 4, and 3L	See Proposed Action and Alternatives 2, 3, and 4
Recreation	Physical, access, use, or functional changes to established, designated, or planned recreation areas, resources, experiences, or activities; conflicts with Federal, state, or local policies; affect OHV designations, access, or routes; impacts to hunting access.	See Proposed Action and Alternatives 2, 3, and 4	See Proposed Action and Alternatives 2, 4, and 3K	See Proposed Action and Alternatives 2 and 4G	See Proposed Action and Alternatives 2, 3L, and 4G	See Proposed Action and Alternatives 2, 4, and 3L	See Proposed Action and Alternatives 2, 3, and 4
Special Designations, Management Allocations, and Wilderness Resources	Conflict with goals, objectives & resources an area is designated to protect	Negligible loss of acreage to lands with wilderness characteristics Polygon 23	See Proposed Action and Alternatives 2, 4, and 3K	See Proposed Action and Alternatives 2 and 4G	See Proposed Action and Alternatives 2, 3L, and 4G	See Proposed Action and Alternatives 2, 4, and 3L	See Proposed Action and Alternatives 2, 3, and 4
Noise	Exceedance of regulations or guideline; exposure of receptors to excessive noise levels; generate noise levels that pose a health risk.	No NSR present.	No NSR present.	No NSR present.	No NSR present.	No NSR present.	No NSR present.
Hazards and Hazardous Materials	Generation, use, handling, or disturbance of hazardous waste that: violates Federal, state, or local laws or regulations; poses a health or safety risk to public or environment; releases hazardous emissions; creates a safety hazard to public or private airstrips; or exposes workers, schools, or the public to hazardous materials.	Negligible risk with adherence to Federal, state, and local laws and regulations; BMPs, APMs, and a HMMP; and the Hazardous Materials Mitigation Sequence.	Same as p-09	Same as p-09	Same as p-09	Same as p-09	Same as p-09
Public Health and Safety	Risks to public health, safety, utilities; fire or electrocution hazard; EMF emissions	With worker education programs, adherence to BMPS and APMs, risks for adverse impacts would be negligible to minor for	Same as p-09	Same as p-09	Same as p-09	Same as p-09	Same as p-09

CHARACTERISTIC OR RESOURCE IMPACT		p-09	p-10	p-11	p-12	p-13	p-14
		all receptors. Impacts to public health and safety due to EMF during operations would be long-term negligible to minor.					
Socioeconomics & Environmental Justice	Not available at this scale						
Traffic and Transportation	Increased roadway traffic; damage to roadways, access, or road systems; risk to aviation	All traffic and transportation risks reduced to negligible to minor with adherence to APMs, BMPs, and MMs TT-1 and TT-2.	Same as p-09	Same as p-09	Same as p-09	Same as p-09	Same as p-09
Visual Resources	Conflicts with visual standards, ordinances, or policies established; major and unmitigated visual changes that degrade or disrupt views of scenic landscapes from highly sensitive viewing locations; VRM class objectives that would not be met requiring an RMP Amendment.	Structures would outsize the landscape features and portions would be skylined. The Project, in conjunction with the DPV1 infrastructure, would be a major modification to the landscape and would dominate the view, thus not conforming to VRM Class III objectives. Would require change from VRM Class III to VRM Class IV.	Same as p-09. Change to VRM Class IV limited to the viewshed where both the Project and DPV1 would be visible, while the rest of the BLM utility corridor would remain VRM Class III.	Same as p-09. Change to VRM Class IV limited to the viewshed where both the Project and DPV1 would be visible, while the rest of the BLM utility corridor would remain VRM Class III.	Same as p-09	Same as p-09	Conforms to VRM Class III standards and no RMP amendment or additional mitigation would be required.
Water Resources	Impacts to surface water or groundwater quantity or availability; impediments to floodplain function from channel alterations; impacts to water rights or water quality; violations of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act.	Except where floodplains are too extensive to be spanned between structures impacts should be long-term negligible using BMPs, APMs, or avoidance through design and placement of structures. Otherwise must comply with 404 permitting or Section 10 permitting to minimize impacts.	Same as p-09	Same as p-09	Same as p-09	Same as p-09	Same as p-09

[1]Site density calculations include sites that have been previously determined or recommended as ineligible for the NRHP. In cases where the projected counts of NRHP-eligible or site of unknown NRHP eligibility are 0 and the site density is greater than 0, the site density calculation includes NRHP ineligible sites.

Table 4.20-5b Copper Bottom Zone Comparison of Impacts by Segment – cb-1 through 6

CHARACTERISTIC OR RESOURCE IMPACT		cb-01	cb-02	cb-03	cb-04	cb-05	cb-06
Segment length (miles)		3.2	2.2	4.3	1.9	4.4	1.9
Land ownership (miles)	BLM	3.2	2.2	2.2	1.7	3.9	1.3
	Reclamation	-	-	0.1	0.2	0.5	0.6
	Arizona State Trust	-	-	-	-	-	-
	CRIT	-	-	2.0	-		-
Ground disturbance	Short-term Acres	69.0	63.0	24.7	7.8	25.6	16.2
	Long-term Acres	17.2	1.3	16.2	12.8	25.1	14.0
Water Use	Total Gallons	860,690.6	588,935.5	1,166,604.1	494,496.0	1,162,135.3	503,409.6
BLM Yuma RMP conformance	VRM	Amendment required	Amendment required	Amendment required	Amendment required	Amendment required	Amendment required
	Corridors	No	No	Yes	No	No	No
	RMP Conformance	No	No	Yes	No	No	No
Other Plan conformance (Federal, county, municipal)	Plan Conformance	Yes	Yes	Yes	Yes	Yes	Yes
Air Quality and Climate Change	Air Quality Emissions are proportional to the Proposed Action based on length of each segment. Due to the length of each segment, the impact of individual segments on air quality may be negligible to minor. However, the cumulative impact of all project segments might have large total emissions, but the emissions are distributed across a long linear area. Climate Change is not available at this smaller scale.						
Geology, Minerals, and Soil Resources	Geological Hazards Minerals/Mining (access to known resources or claims) Soils	Earthquake risk long-term negligible; no mapped active faults. No active mines; negligible short-term potential for preclusion of access; Soil loss/erosion risk negligible to minor, short term to long term; adherence to APMs & BMPs reduces risks to negligible. Negligible disruption of sand transport or dunes during construction and operation.	Same as cb-01	Same as cb-01	Same as cb-01	Same as cb-01	Same as cb-01
Paleontological Resources	Potential Fossil Yield Classification	Very low	Very low	Very low	Very low to unknown	Unknown	Unknown

CHARACTERISTIC OR RESOURCE IMPACT		cb-01	cb-02	cb-03	cb-04	cb-05	cb-06
Biological Resources (Vegetation Resources, Wildlife, including Special Status Species and Migratory Birds)	Loss of native habitat/communities; Noxious weeds; Special Status Species & animals); Increased risk of predation or electrocution re infrastructure; Displacement via construction; Displacement via human activity including recreation; Impacts to native habitat and designated management areas; and Migratory birds.	Project development may impact important bighorn sheep use area.	Temporary impact from reduced access by desert bighorn sheep and mule deer to reliable water sources and limit use of favored habitat areas during critical time period, including bighorn sheep lambing. Permanent disruption of near-pristine desert, mountain, and desert wash habitats for Gila monster, Sonoran desert tortoise, and Lucy's warbler.	The impacts of Project development would be additive to the existing habitat fragmentation for desert bighorn sheep through the narrow Copper Bottom Pass.	Temporary impact from reduced access by desert bighorn sheep and mule deer to reliable water sources and limit use of favored habitat areas during critical time period, including bighorn sheep lambing area. Permanent disruption of near-pristine desert, mountain, and desert wash habitats for Gila monster, Sonoran desert tortoise, and Lucy's warbler.	Project development would add disturbance to a remote area in very harsh desert conditions with large areas of desert pavement. Project development would add disturbance to a remote area.	
Cultural Resources	Damage or loss of a cultural site or potential site under Federal or state registers; degradation of the setting for a cultural site where setting is significant to its listing eligibility; increased access leading to potential vandalism; disturbance of human remains	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 4.8%). Known site density: 0.0 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 0. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 38.5%). Known site density: 3.2 sites per 100 acres.[1] Projected NRHP-eligible sites or sites requiring NRHP evaluation: 0. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 1 (cultural resources survey coverage: 15.6%). Known site density: 12.0 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 6. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 3 (cultural resources survey coverage: 45.2%). Known site density: 14.6 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 7. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 8.7%). Known site density: 0.0 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 0. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 0.3%). Known site density: 0.0 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 0. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.
Issues of Concern to Indian Tribes	Existing and new access, native infrastructure and the interconnection of the cultural and natural environment, places of elevated spiritual important to tribes, the Colorado River, the treatment of human remains, and the disturbance of previously pristine landscapes.	Native infrastructure and the interconnectedness of the cultural and natural environment; intrusion on pristine landscapes.	Native infrastructure and the interconnectedness of the cultural and natural environment; intrusion on pristine landscapes.	Native infrastructure and the interconnectedness of the cultural and natural environment.	Native infrastructure and the interconnectedness of the cultural and natural environment; intrusion on pristine landscapes.	Native infrastructure and the interconnectedness of the cultural and natural environment; intrusion on pristine landscapes; places of elevated spiritual importance; intrusion on pristine landscapes.	Native infrastructure and the interconnectedness of the cultural and natural environment.

CHARACTERISTIC OR RESOURCE IMPACT		cb-01	cb-02	cb-03	cb-04	cb-05	cb-06
Land Use	Land use authorizations and ROWs; Residential; Agricultural; Other (i.e., nuisance impacts)	See Alternatives 3 and 4E	See Alternatives 4, 2C, and 3K	Crosses CRIT land (would require an easement)	See Alternatives 3, 4, and 2C	See Alternatives 3 and 4F	See Alternatives 4 and 2C
Grazing and Rangeland	Access to range or improvements; Loss of range relative to AUMs; Fragmentation of allotments; Degradation of range quality	Negligible to minor short-term disturbance to WHB burros, and livestock from helicopters; potential fugitive dust effects to grazing forage in the vicinity of the fly yard. See Alternatives 3 and 4E	Negligible to minor short-term disturbance to WHB and livestock from helicopters; potential fugitive dust effects to grazing forage in the vicinity of the fly yard. See Alternatives 4, 2C, and 3K	See Alternative 2D	See Alternatives 3, 4, and 2C	See Alternatives 3 and 4F	See Alternatives 4 and 2C
Recreation	Physical, access, use, or functional changes to established, designated, or planned recreation areas, resources, experiences, or activities; conflicts with Federal, state, or local policies; affect OHV designations, access, or routes; impacts to hunting access.	See Alternatives 3 and 4E	See Alternatives 4, 2C, and 3K	See Alternative 2D	See Alternatives 3, 4, and 2C	See Alternatives 3 and 4F	See Alternatives 4 and 2C
Special Designations, Management Allocations, and Wilderness Resources	Conflict with goals, objectives & resources an area is designated to protect	Major long-term impacts to lands with wilderness characteristics Polygon 23, reducing it to less than 5,000 acres, which does not meet the criteria for WAs	Major long-term impacts to lands with wilderness characteristics Polygon 23, reducing it to less than 5,000 acres, which does not meet the criteria for WAs	See Alternative 2D	Major long-term impacts to lands with wilderness characteristics Polygon 23, reducing it to less than 5,000 acres, which does not meet the criteria for WAs	See Alternatives 3 and 4F	See Alternatives 4 and 2C
Noise	Exceedance of regulations or guideline; exposure of receptors to excessive noise levels; generate noise levels that pose a health risk.	No NSR present. See Alternatives 3 and 4E	No NSR present. See Alternatives 4, 2C, and 3K	No NSR present. See Alternative 2D	No NSR present. See Alternatives 3, 4, and 2C	No NSR present. See Alternatives 3 and 4F	No NSR present. See Alternatives 4 and 2C

CHARACTERISTIC OR RESOURCE IMPACT		cb-01	cb-02	cb-03	cb-04	cb-05	cb-06
Hazards and Hazardous Materials	Generation, use, handling, or disturbance of hazardous waste that: violates Federal, state, or local laws or regulations; poses a health or safety risk to public or environment; releases hazardous emissions; creates a safety hazard to public or private airstrips; or exposes workers, schools, or the public to hazardous materials.	Negligible risk with adherence to Federal, state, and local laws and regulations; BMPs, APMs, and a HMMP; and the Hazardous Materials Mitigation Sequence.	Same as cb-01	Same as cb-01	Same as cb-01	Same as cb-01	Same as cb-01
Public Health and Safety	Risks to public health, safety, utilities; fire or electrocution hazard; EMF emissions	With worker education programs, adherence to BMPS and APMs, risks for adverse impacts would be negligible to minor for all receptors. Impacts to public health and safety due to EMF during operations would be long-term negligible to minor.	Same as cb-01	Same as cb-01	Same as cb-01	Same as cb-01	Same as cb-01
Socioeconomics & Environmental Justice	Not available at this scale						
Traffic and Transportation	Increased roadway traffic; damage to roadways, access, or road systems; risk to aviation	All traffic and transportation risks reduced to negligible to minor with adherence to APMs, BMPs, and MMs TT-1 and TT-2.	Same as cb-01	Same as cb-01	Same as cb-01	Same as cb-01	Same as cb-01
Visual Resources	Conflicts with visual standards, ordinances, or policies established; major and unmitigated visual changes that degrade or disrupt views of scenic landscapes from highly sensitive viewing locations; VRM class objectives that would not be met requiring an RMP Amendment.	Structures outsize landscape features and portions would be skylined. It would be a new visual addition in a heavily used, relatively scenic, and visually sensitive area. The Project would be a major modification to the landscape and would dominate the view, thus not conforming to VRM Class II objectives. RMP amendment to VRM Class IV limited to the viewshed	Same as cb-01	Structures would outsize the surrounding landscape features and portions may be skylined. Viewed in the context of DPV1, and taken together, it would be a major modification to the landscape and would dominate the view, thus not conforming to VRM Class III objectives. RMP amendment to VRM Class IV limited to the viewshed where segment would be visible, while the rest of the BLM utility corridor unaffected by the Project would remain VRM Class III.	Same as cb-01	Predominantly open panoramic views heavily used for OHV recreation. Proposed guyed V structures would be replaced with self-supporting lattice structures to eliminate potentially hazardous guy wires and reduce contrast with the existing DPV1 infrastructure, where viewed in conjunction with the Project. VRM Class III objectives would not be met.	Same as cb-05. VRM Class II objectives would not be met.

CHARACTERISTIC OR RESOURCE IMPACT		cb-01	cb-02	cb-03	cb-04	cb-05	cb-06
		where segment would be visible, while the rest of the BLM utility corridor unaffected by the Project would remain VRM Class III.					
Water Resources	Impacts to surface water or groundwater quantity or availability; impediments to floodplain function from channel alterations; impacts to water rights or water quality; violations of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act.	Except where floodplains are too extensive to be spanned between structures impacts should be long-term negligible using BMPs, APMs, or avoidance through design and placement of structures. Otherwise must comply with 404 permitting or Section 10 permitting to minimize impacts.	Same as cb-01	Same as cb-01	Same as cb-01	Same as cb-01	Same as cb-01

[1]Site density calculations include sites that have been previously determined or recommended as ineligible for the NRHP. In cases where the projected counts of NRHP-eligible or site of unknown NRHP eligibility are 0 and the site density is greater than 0, the site density calculation includes NRHP ineligible sites.

Table 4.20-5c Copper Bottom Zone Comparison of Impacts by Segment – i segments

CHARACTERISTIC OR RESOURCE IMPACT		i-06	i-07	x-08
Segment length (miles)		7.2	6.3	1.3
Land ownership (miles)	BLM	3.9	-	-
	Reclamation	0.2	5.1	1.3
	Arizona State Trust	1.7	1.2	-
	CRIT	1.4	-	-
Ground disturbance	Short-term Acres	39.2	35.2	6.0
	Long-term Acres	26.1	22.2	4.8
Water Use	Total Gallons	1,896,008.7	1,630,459.1	344,829.3
BLM Yuma RMP conformance	VRM	Amendment required	Compliant	Compliant
	Corridors	Yes	Yes	Yes
	RMP Conformance	Yes	Yes	Yes
Other Plan conformance (Federal, county, municipal)	Plan Conformance	Yes	Yes	Yes
Air Quality and Climate Change	Air Quality Emissions are proportional to the Proposed Action based on length of each segment. Due to the length of each segment, the impact of individual segments on air quality may be negligible to minor. However, the cumulative impact of all project segments might have large total emissions, but the emissions are distributed across a long linear area. Climate Change is not available at this smaller scale.			
Geology, Minerals, and Soil Resources	Geological Hazards Minerals/Mining (access to known resources or claims) Soils	Earthquake risk long-term negligible; no mapped active faults. No active mines; negligible short-term potential for preclusion of access; Soil loss/erosion risk negligible to minor, short term to long term; adherence to APMs & BMPs reduces risks to negligible. Negligible disruption of sand transport or dunes during construction and operation.	Same as i-06	Same as i-06
Paleontological Resources	Potential Fossil Yield Classification	Very low to unknown	Unknown	Very low to unknown
Biological Resources (Vegetation Resources, Wildlife, including Special Status Species and Migratory Birds)	Loss of native habitat/communities; Noxious weeds; Special Status Species & animals); Increased risk of predation or electrocution re infrastructure; Displacement via construction; Displacement via human activity including recreation; Impacts to native habitat and designated management areas; and Migratory birds.	Project development of segments adjacent to I-10 would have minimal impact due to the on-going influence I-10 has on wildlife in the area.		Project development would add disturbance to a remote area in very harsh desert conditions with large areas of desert pavement. Project development would add disturbance to a remote area.

CHARACTERISTIC OR RESOURCE IMPACT		i-06	i-07	x-08
Cultural Resources	Damage or loss of a cultural site or potential site under Federal or state registers; degradation of the setting for a cultural site where setting is significant to its listing eligibility; increased access leading to potential vandalism; disturbance of human remains	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 37.7%). Known site density: 1.5 sites per 100 acres[1]. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 0. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 3 (cultural resources survey coverage: 33.3%). Known site density: 7.8 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 9. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 1 (cultural resources survey coverage: 23.5%). Known site density: 13.2 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 4. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.
Issues of Concern to Indian Tribes	Existing and new access, native infrastructure and the interconnection of the cultural and natural environment, places of elevated spiritual important to tribes, the Colorado River, the treatment of human remains, and the disturbance of previously pristine landscapes.	Native infrastructure and the interconnectedness of the cultural and natural environment.	Native infrastructure and the interconnectedness of the cultural and natural environment.	Native infrastructure and the interconnectedness of the cultural and natural environment.
Land Use	Land use authorizations and ROWs; Residential; Agricultural; Other (i.e., nuisance impacts)	Crosses CRIT land (would require an easement); crosses state trust land	Minor, short-term effects to residential land during construction. Minor, long-term effects to residential land during operations. Crosses state trust land (moderate long-term impact).	See Alternatives 3L and 4H
Grazing and Rangeland	Access to range or improvements; Loss of range relative to AUMs; Fragmentation of allotments; Degradation of range quality	See Alternatives 1 and 3L	See Alternatives 1 and 4H	See Alternatives 3L and 4H
Recreation	Physical, access, use, or functional changes to established, designated, or planned recreation areas, resources, experiences, or activities; conflicts with Federal, state, or local policies; affect OHV designations, access, or routes; impacts to hunting access.	Bisects Dome Rock Camping Area (major long-term effect).	See Alternatives 1 and 4H	See Alternatives 3L and 4H
Special Designations, Management Allocations, and Wilderness Resources	Conflict with goals, objectives & resources an area is designated to protect	See Alternatives 1 and 3L	See Alternatives 1 and 4H	See Alternatives 3L and 4H
Noise	Exceedance of regulations or guideline; exposure of receptors to excessive noise levels; generate noise levels that pose a health risk.	No NSR present. See Alternatives 1 and 3L	No NSR present. See Alternatives 1 and 4H	No NSR present. See Alternatives 3L and 4H
Hazards and Hazardous Materials	Generation, use, handling, or disturbance of hazardous waste that: violates Federal, state, or local laws or regulations; poses a health or safety risk to public or environment; releases hazardous emissions; creates a safety hazard to public or private airstrips; or	Negligible risk with adherence to Federal, state, and local laws and regulations; BMPs, APMs, and a HMMP; and the Hazardous Materials Mitigation Sequence.	Same as i-06	Same as i-06

CHARACTERISTIC OR RESOURCE IMPACT		i-06	i-07	x-08
	exposes workers, schools, or the public to hazardous materials.			
Public Health and Safety	Risks to public health, safety, utilities; fire or electrocution hazard; EMF emissions	With worker education programs, adherence to BMPS and APMs, risks for adverse impacts would be negligible to minor for all receptors. Impacts to public health and safety due to EMF during operations would be long-term negligible to minor.	Same as i-06	Same as i-06
Socioeconomics & Environmental Justice	Not available at this scale			
Traffic and Transportation	Increased roadway traffic; damage to roadways, access, or road systems; risk to aviation	All traffic and transportation risks reduced to negligible to minor with adherence to APMs, BMPs, and MMs TT-1 and TT-2.	See i-06, except MM-TT-02 not necessary.	See i-06, except MM-TT-02 not necessary.
Visual Resources	Conflicts with visual standards, ordinances, or policies established; major and unmitigated visual changes that degrade or disrupt views of scenic landscapes from highly sensitive viewing locations; VRM class objectives that would not be met requiring an RMP Amendment.	I-10 viewers would be in close proximity. Change the VRM Class III to Class IV within the BLM utility corridor.	I-10 viewers would be in close proximity.	I-10 viewers would be in close proximity.
Water Resources	Impacts to surface water or groundwater quantity or availability; impediments to floodplain function from channel alterations; impacts to water rights or water quality; violations of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act.	Except where floodplains are too extensive to be spanned between structures impacts should be long-term negligible using BMPs, APMs, or avoidance through design and placement of structures. Otherwise must comply with 404 permitting or Section 10 permitting to minimize impacts.	Crossings of high risk floodplains associated with Ehrenberg and Cinnabar Washes, likely greater than a single span (negligible effect). Otherwise the same as i-06.	Same as i-06

[1]Site density calculations include sites that have been previously determined or recommended as ineligible for the NRHP. In cases where the projected counts of NRHP-eligible or site of unknown NRHP eligibility are 0 and the site density is greater than 0, the site density calculation includes NRHP ineligible sites.

Table 4.20-6a Colorado River and California Zone Comparison of Impacts by Segment – p segments and cb-10

CHARACTERISTIC OR RESOURCE IMPACT		p-15e (Arizona)	p-15w (California)	p-16 (California)	p-17 (California)	p-18 (California)	cb-10 (Arizona)
Segment length (miles)		2.8	6.6	4.6	3.1	2.4	1.9
Land ownership (miles)	BLM	1.5	-	0.4	2.3	0.8	1.0
	Reclamation	-	-	-	-	-	-
	Arizona State Trust	1.3	-	-	-	-	0.9
	Private	-	6.6	4.2	0.8	1.6	-
Ground disturbance	Short-term Acres	20.3	41.5	35.9	18.7	25.8	12.2
	Long-term Acres	16.8	6.0	7.6	11.0	9.8	7.0
Water Use	Total Gallons	747,692.3	1,721,428.2	1,204,013.7	823,698.3	643,880.9	508,805.3
BLM Yuma RMP conformance	VRM	Compliant	Not applicable	Not applicable	Not applicable	Not applicable	Compliant
	Corridors	Yes	Not applicable	Not applicable	Not applicable	Not applicable	Yes
	RMP Conformance	Compliant on BLM land	Not applicable	Not applicable	Not applicable	Not applicable	Compliant on BLM land
CDCA Plan	Plan Conformance	Not applicable	Amendment required	Amendment required	Amendment required	Amendment required	Amendment required
Other Plan conformance (Federal, county, municipal)	Plan Conformance	Yes	Yes	Yes	Yes	Yes	Yes
Air Quality and Climate Change	Air Quality Emissions are proportional to the Proposed Action based on length of each segment. Due to the length of each segment, the impact of individual segments on air quality may be negligible to minor. However, the cumulative impact of all project segments might have large total emissions, but the emissions are distributed across a long linear area. Climate Change is not available at this smaller scale.						
Geology, Minerals, and Soil Resources	Geological Hazards Minerals/Mining (access to known resources or claims) Soils	Earthquake risk long-term negligible; no mapped active faults. No active mines; negligible short-term potential for preclusion of access; Soil loss/erosion risk negligible to minor, short term to long term; adherence to APMs & BMPs reduces risks to negligible. Negligible disruption of sand transport or dunes during construction and operation.	Same as p-15e	Same as p-15e	Negligible impact to sand dunes and sand transport corridor during construction and operation.	Negligible impact to sand dunes and sand transport corridor during construction and operation.	Same as p-15e
Paleontological Resources	Potential Fossil Yield Classification	Unknown	Unknown	High to unknown	Unknown	High to unknown	Unknown

CHARACTERISTIC OR RESOURCE IMPACT		p-15e (Arizona)	p-15w (California)	p-16 (California)	p-17 (California)	p-18 (California)	cb-10 (Arizona)
Biological Resources (Vegetation Resources, Wildlife, including Special Status Species and Migratory Birds)	Loss of native habitat/communities; Noxious weeds; Special Status Species & animals); Increased risk of predation or electrocution re infrastructure; Displacement via construction; Displacement via human activity including recreation; Impacts to native habitat and designated management areas; and Migratory birds.	Colorado River crossing open water spanned to avoid direct impacts to aquatic habitat, but 3-4 structures in river corridor would affect riparian vegetation. Reduced collision hazard to migratory birds along river corridor due to matching structure spacing and heights.	Spanned floodplain and canals west of the Colorado River but could be risk of avian mortality due to collision with towers and lines.	Spanned floodplain and canals west of the Colorado River but could be risk of avian mortality due to collision with towers and lines. Long-term impact to less than 0.1 acre of honey mesquite Alliance on non-BLM lands.	Permanent impacts to 2-3 acres of wash habitat for blue paloverde-ironwood. Potential impact to suitable habitat for Mojave desert tortoise near Mule Mountains.		Colorado River crossing, open water spanned to avoid direct impacts to aquatic habitat, but 3-4 structures in river corridor would affect riparian vegetation. Greater collision hazard to migratory birds along river corridor due to not adjacent to existing line.
Cultural Resources	Damage or loss of a cultural site or potential site under Federal or state registers; degradation of the setting for a cultural site where setting is significant to its listing eligibility; increased access leading to potential vandalism; disturbance of human remains.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 3 (cultural resources survey coverage: 68.5%). Known site density: 14.1 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 10. One NRHP-listed intaglio site is within the indirect effects analysis area. Analysis of potential visual impacts to this historic property would be required as part of the indirect effects analysis.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 2 (cultural resources survey coverage: 32.4%). Known site density: 15.3 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 25. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 5 (cultural resources survey coverage: 14.6%). Known site density: 47.3 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 34. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 9 (cultural resources survey coverage: 100%). Known site density: 35.1 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 9. One NRHP-listed archaeological district is within the 200-foot analysis corridor. Analysis of potential visual impacts to this historic property would be required as part of the indirect effects analysis.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 8 (cultural resources survey coverage: 100%). Known site density: 22.3 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 8. The Palo Verde Mesa is considered a culturally sensitive area of great importance and may contain classes of archaeological sites considered to be sensitive to visual effects.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 14.1%). Known site density: 0.0 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 0. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.
Issues of Concern to Indian Tribes	Existing and new access, native infrastructure and the interconnection of the cultural and natural environment, places of elevated spiritual important to tribes, the Colorado River, the treatment of human remains, and the disturbance of previously pristine landscapes.	Native infrastructure and the interconnectedness of the cultural and natural environment; places of elevated spiritual importance; Colorado River.	Colorado River.	Native infrastructure and the interconnectedness of the cultural and natural environment.	Native infrastructure and the interconnectedness of the cultural and natural environment; places of elevated spiritual importance; Colorado River.	Places of elevated spiritual importance.	Native infrastructure and the interconnectedness of the cultural and natural environment; Colorado River.

CHARACTERISTIC OR RESOURCE IMPACT		p-15e (Arizona)	p-15w (California)	p-16 (California)	p-17 (California)	p-18 (California)	cb-10 (Arizona)
Land Use	Land use authorizations and ROWs; Residential; Agricultural; Other (i.e., nuisance impacts)	Crosses state trust land (moderate, long-term impact).	Minor, short-term effects to residential land during construction. Minor, long-term effects to residential land during operations. Includes NRCS-classified farmland (negligible impact).	See Proposed Action and Alternatives 2 and 4P	See Proposed Action and Alternative 4P	Within or adjacent to existing or approved but not yet constructed solar energy facilities (minor short-term impacts).	Crosses state trust land (moderate, long-term impact).
Grazing and Rangeland	Access to range or improvements; Loss of range relative to AUMs; Fragmentation of allotments; Degradation of range quality	See Proposed Action and Alternatives 2, 4, and 3M	See Proposed Action and Alternatives 2, 4, and 3M	See Proposed Action and Alternatives 2 and 4P	See Proposed Action and Alternative 4P	See Proposed Action and Alternative 4P	See Alternatives 3 and 4L
Recreation	Physical, access, use, or functional changes to established, designated, or planned recreation areas, resources, experiences, or activities; conflicts with Federal, state, or local policies; affect OHV designations, access, or routes; impacts to hunting access.	See Proposed Action and Alternatives 2, 4, and 3M	See Proposed Action and Alternatives 2, 4, and 3M	See Proposed Action and Alternatives 2 and 4P	See Proposed Action and Alternative 4P	See Proposed Action and Alternative 4P	See Alternatives 3 and 4L
Special Designations, Management Allocations, and Wilderness Resources	Conflict with goals, objectives & resources an area is designated to protect	See Proposed Action and Alternatives 2, 4, and 3M	See Proposed Action and Alternatives 2, 4, and 3M	See Proposed Action and Alternatives 2 and 4P	See Proposed Action and Alternative 4P	See Proposed Action and Alternative 4P	See Alternatives 3 and 4L
Noise	Exceedance of regulations or guideline; exposure of receptors to excessive noise levels; generate noise levels that pose a health risk.	No NSR present. See Proposed Action and Alternatives 2, 4, and 3M	8 NSR are present, including rural residential area near Ripley, CA. See Proposed Action and Alternatives 2, 4, and 3M	No NSR present. See Proposed Action and Alternatives 2 and 4P	No NSR present. See Proposed Action and Alternative 4P	No NSR present. See Proposed Action and Alternative 4P	No NSR present. See Alternatives 3 and 4L
Hazards and Hazardous Materials	Generation, use, handling, or disturbance of hazardous waste that: violates Federal, state, or local laws or regulations; poses a health or safety risk to public or environment; releases hazardous emissions; creates a safety hazard to public or private airstrips; or exposes workers, schools,	Negligible risk with adherence to Federal, state, and local laws and regulations; BMPs, APMs, and a HMMP; and the Hazardous Materials Mitigation Sequence.	Same as p-15e	Same as p-15e	Same as p-15e	Same as p-15e	Same as p-15e

CHARACTERISTIC OR RESOURCE IMPACT		p-15e (Arizona)	p-15w (California)	p-16 (California)	p-17 (California)	p-18 (California)	cb-10 (Arizona)
	or the public to hazardous materials.						
Public Health and Safety	Risks to public health, safety, utilities; fire or electrocution hazard; EMF emissions	With worker education programs, adherence to BMPS and APMs, risks for adverse impacts would be negligible to minor for all receptors. Impacts to public health and safety due to EMF during operations would be long-term negligible to minor.	Same as p-15e	Same as p-15e	Same as p-15e	Same as p-15e	Same as p-15e
Socioeconomics & Environmental Justice	Not available at this scale						
Traffic and Transportation	Increased roadway traffic; damage to roadways, access, or road systems; risk to aviation	All traffic and transportation risks reduced to negligible to minor with adherence to APMs, BMPs, and MMs TT-1 and TT-2.	Same as p-15e	Same as p-15e	Same as p-15e	Same as p-15e	Same as p-15e
Visual Resources	Conflicts with visual standards, ordinances, or policies established; major and unmitigated visual changes that degrade or disrupt views of scenic landscapes from highly sensitive viewing locations; VRM class objectives that would not be met requiring an RMP Amendment.	Conforms to VRM class objectives no additional mitigation would be required.	Conforms to VRM class objectives no additional mitigation would be required. The main impact to viewers would be added visual clutter, which would be a negligible to moderate impact.	Conforms to VRM class objectives no additional mitigation would be required.	Conforms to VRM class objectives no additional mitigation would be required.	Conforms to VRM class objectives no additional mitigation would be required.	Conforms to VRM class objectives no additional mitigation would be required.
Water Resources	Impacts to surface water or groundwater quantity or availability; impediments to floodplain function from channel alterations; impacts to water rights or water quality; violations of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act.	Crossings of high risk floodplains associated with the Colorado River, likely greater than a single span (negligible impact). Otherwise the same as p-15w.	Same as p-15e	Except where floodplains are too extensive to be spanned between structures impacts should be long-term negligible using BMPs, APMs, or avoidance through design and placement of structures. Otherwise must comply with 404 permitting or Section 10 permitting to minimize impacts.	Same as p-16	Same as p-16	Crossings of high risk floodplains associated with the Colorado River, likely greater than a single span (negligible impact). Same as p-15e.

Table 4.20-6b Colorado River and California Zone Comparison of Impacts by Segment – i and ca Segments

CHARACTERISTIC OR RESOURCE IMPACT		i-08s (Arizona)	ca-01	ca-02	ca-04	ca-05	ca-06	ca-07	ca-09
Segment length (miles)		1.3	6.7	3.4	0.4	6.6	2.8	3.0	2.6
Land ownership (miles)	BLM	-	-	0.6	-	-	0.2	2.5	1.6
	Reclamation	0.9		-	-				
	Arizona State Trust	0.2	-	-	-	-	-	-	-
	Private	0.2	6.7	2.8	0.4	6.6	2.6	0.5	1.0
Ground disturbance	Short-term Acres	7.5	45.1	21.2	3.1	43.5	17.9	15.8	16.7
	Long-term Acres	4.9	23.6	12.0	1.3	23.6	12.3	13.4	9.3
Water Use	Total Gallons	352,658.1	1,754,784.7	893,801.7	110,633.4	1,729540.4	743,206.1	777,480.2	674,275.1
BLM Yuma RMP conformance	VRM	Compliant	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
	Corridors	Yes	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
	RMP Conformance	Compliant on BLM land	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
CDCA Plan	Plan Conformance	Not applicable	Amendment required	Amendment required	Amendment required	Amendment required	Amendment required	Amendment required	Amendment required
Other Plan conformance (Federal, county, municipal	Plan Conformance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Air Quality and Climate Change	Air Quality Emissions are proportional to the Proposed Action based on length of each segment. Due to the length of each segment, the impact of individual segments on air quality may be negligible to minor. However, the cumulative impact of all project segments might have large total emissions, but the emissions are distributed across a long linear area. Climate Change is not available at this smaller scale.								
Geology, Minerals, and Soil Resources	Geological Hazards Minerals/Mining (access to known resources or claims) Soils	Earthquake risk long-term negligible; no mapped active faults. No active mines; negligible short-term potential for preclusion of access; Soil loss/erosion risk negligible to minor, short term to long term; adherence to APMs & BMPs reduces risks to negligible. Negligible disruption of sand transport or dunes during construction and operation.	Same as i-08s	Same as i-08s	Same as i-08s	Same as i-08s	Same as i-08s	Negligible to minor impact on sand transport corridor and dunes during construction and operation	Negligible to minor impact on sand transport corridor and dunes during construction and operation
Paleontological Resources	Potential Fossil Yield Classification	Low to unknown	Unknown	Unknown to high	Unknown	Unknown	Unknown to high	Unknown to high	Unknown

CHARACTERISTIC OR RESOURCE IMPACT		i-08s (Arizona)	ca-01	ca-02	ca-04	ca-05	ca-06	ca-07	ca-09
Biological Resources (Vegetation Resources Wildlife, including Special Status Species and Migratory Birds)	Loss of native habitat/communities; Noxious weeds; Special Status Species & animals); Increased risk of predation or electrocution re infrastructure; Displacement via construction; Displacement via human activity including recreation; Impacts to native habitat and designated management areas; and Migratory birds.	Colorado River crossing not adjacent to existing lines or development adding additional collision risk for birds moving along the river corridor. Open water crossing spanned so no direct impact to aquatic habitats; Reduced potential loss of riparian vegetation due to narrower crossing.	Spanned floodplain and canals west of the Colorado River, now agricultural, used by foraging and migrating birds but risk of avian mortality due to collision with towers and lines.	Spanned floodplain and canals west of the Colorado River, now agricultural, used by foraging and migrating birds but risk of avian mortality due to collision with towers and lines. Permanent impact to 0.9 acre of honey mesquite Alliance and 0.9 acre of big galleta Alliance.	West of the Colorado River in historic floodplain, now agricultural, used by foraging and migrating birds. Risk of avian mortality due to collision with towers and lines.	Spanned floodplain and canals west of the Colorado River, now agricultural, used by foraging and migrating birds but risk of avian mortality due to collision with towers and lines.	Spanned floodplain and canals west of the Colorado River, now agricultural, used by foraging and migrating birds but risk of avian mortality due to collision with towers and lines. Less than 0.1 acre of arrowweed Alliance impacted on BLM land and 0.2 acre of honey mesquite Alliance on non-BLM land.	Potential long-term impact to active windblown sand depositional areas with resulting potential impact to Harwood’s eriastrum and Mojave fringe-toed lizard. Impact to blue paloverde-ironwood along wash crossing on 1 acre in ca-07. Potential impacts to 1.2 acres of big galleta Alliance.	Potential long-term impact to active windblown sand depositional areas with resulting potential impact to Harwood’s eriastrum and Mojave fringe-toed lizard.
Cultural Resources	Damage or loss of a cultural site or potential site under Federal or state registers; degradation of the setting for a cultural site where setting is significant to its listing eligibility; increased access leading to potential vandalism; disturbance of human remains.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 28.9%). Known site density: 0.0 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 0. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 9 (cultural resources survey coverage: 2.0%). Known site density: 272.7 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 442. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 3 (cultural resources survey coverage: 10.1%). Known site density: 35.7 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 30. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 21.3%). Known site density: 0.0 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 0.0. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 6 (cultural resources survey coverage: 3.4%). Known site density: 109.1 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 177. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 1 (cultural resources survey coverage: 33.1%). Known site density: 4.7 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 3. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 70.4%). Known site density: 3.8 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 0. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 100%). Known site density: 3.2 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 0. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from structures along this segment.

CHARACTERISTIC OR RESOURCE IMPACT		i-08s (Arizona)	ca-01	ca-02	ca-04	ca-05	ca-06	ca-07	ca-09
Issues of Concern to Indian Tribes	Existing and new access, native infrastructure and the interconnection of the cultural and natural environment, places of elevated spiritual important to tribes, the Colorado River, the treatment of human remains, and the disturbance of previously pristine landscapes.	Places of elevated spiritual importance; Colorado River.	No known concerns to Indian tribes.	No known concerns to Indian tribes.	Colorado River	No known concerns to Indian tribes.	No known concerns to Indian tribes.	No known concerns to Indian tribes.	No known concerns to Indian tribes.
Land Use	Land use authorizations and ROWs; Residential; Agricultural; Other (i.e., nuisance impacts)	Crosses state trust land (moderate, long-term impact).	Minor, short-term effects to residential land during construction. Minor, long-term effects to residential land during operations. Crosses NRCS-classified farmland (negligible impact).	See Alternatives 2 and 2E	See Alternatives 1 and 4K	Minor, short-term effects to residential land during construction. Minor, long-term effects to residential land during operations. Crosses NRCS-classified farmland (negligible impact).	Within or adjacent to existing or approved but not yet constructed solar energy facilities (minor, short-term impact).	Within or adjacent to existing or approved but not yet constructed solar energy facilities (minor, short-term impact).	Within or adjacent to existing or approved but not yet constructed solar energy facilities (minor, short-term impact).
Grazing and Rangeland	Access to range or improvements; Loss of range relative to AUMs; Fragmentation of allotments; Degradation of range quality	See Alternatives 1 and 4K	See Alternatives 3, 1E, and 4M	See Alternatives 2 and 2E	See Alternatives 1 and 4K	See Alternative 1	See Alternatives 1, 3, and 4	See Alternatives 1, 2, 3, and 4	See Alternatives 1, 2, 3, and 4
Recreation	Physical, access, use, or functional changes to established, designated, or planned recreation areas, resources, experiences, or activities; conflicts with Federal, state, or local policies; affect OHV designations, access, or routes; impacts to hunting access.	Crosses a portion of the Ehrenberg Sandbowl OHV Area (minor long-term impact).	See Alternatives 3, 1E, and 4M	See Alternatives 2 and 2E	See Alternatives 1 and 4K	See Alternative 1	See Alternatives 1, 3, and 4	See Alternatives 1, 2, 3, and 4	See Alternatives 1, 2, 3, and 4
Special Designations, Management Allocations, and Wilderness Resources	Conflict with goals, objectives & resources an area is designated to protect	See Alternatives 1 and 4K	See Alternatives 3, 1E, and 4M	See Alternatives 2 and 2E	See Alternatives 1 and 4K	See Alternative 1	See Alternatives 1, 3, and 4	See Alternatives 1, 2, 3, and 4	See Alternatives 1, 2, 3, and 4

CHARACTERISTIC OR RESOURCE IMPACT		i-08s (Arizona)	ca-01	ca-02	ca-04	ca-05	ca-06	ca-07	ca-09
Noise	Exceedance of regulations or guideline; exposure of receptors to excessive noise levels; generate noise levels that pose a health risk.	No NSR present. See Alternatives 1 and 4K	8 NSR are present in rural residential area south of Blythe, CA. See Alternatives 3, 1E, and 4M	No NSR present. See Alternatives 2 and 2E	No NSR present. See Alternatives 1 and 4K	21 NSR present in rural residential area near the Cyr Airfield near Blythe, CA. See Alternative 1	3 NSR present in rural residential area near Blyther, CA. See Alternatives 1, 3, and 4	No NSR present. See Alternatives 1, 2, 3, and 4	No NSR present. See Alternatives 1, 2, 3, and 4
Hazards and Hazardous Materials	Generation, use, handling, or disturbance of hazardous waste that: violates Federal, state, or local laws or regulations; poses a health or safety risk to public or environment; releases hazardous emissions; creates a safety hazard to public or private airstrips; or exposes workers, schools, or the public to hazardous materials.	Negligible risk with adherence to Federal, state, and local laws and regulations; BMPs, APMs, and a HMMP; and the Hazardous Materials Mitigation Sequence.	Same as i-08s	Same as i-08s	Same as i-08s	Same as i-08s	Same as i-08s	Same as i-08s	Same as i-08s
Public Health and Safety	Risks to public health, safety, utilities; fire or electrocution hazard; EMF emissions	With worker education programs, adherence to BMPS and APMs, risks for adverse impacts would be negligible to minor for all receptors. Impacts to public health and safety due to EMF during operations would be long-term negligible to minor.	Same as i-08s	Same as i-08s	Same as i-08s	Same as i-08s	Same as i-08s	Same as i-08s	Same as i-08s
Socioeconomics & Environmental Justice	Not available at this scale								
Traffic and Transportation	Increased roadway traffic; damage to roadways, access, or road systems; risk to aviation	All traffic and transportation risks reduced to negligible to minor with adherence to APMs, BMPs, and MMs TT-1 and TT-2.	Same as i-08s	Same as i-08s	Same as i-08s	Same as i-08s	Same as i-08s	Same as i-08s	Same as i-08s

CHARACTERISTIC OR RESOURCE IMPACT		i-08s (Arizona)	ca-01	ca-02	ca-04	ca-05	ca-06	ca-07	ca-09
Visual Resources	Conflicts with visual standards, ordinances, or policies established; major and unmitigated visual changes that degrade or disrupt views of scenic landscapes from highly sensitive viewing locations; VRM class objectives that would not be met requiring an RMP Amendment.	Conforms to VRM class objectives no additional mitigation would be required.	Conforms to VRM class objectives no additional mitigation would be required. The impact to viewers would be negligible for Segment ca-01.	Conforms to VRM class objectives no additional mitigation would be required. The impact to viewers would be negligible for Segment ca-02.	Conforms to VRM class objectives no additional mitigation would be required. The Project would be proportional to the surrounding landscape, thus would not dominate or be a major modification; however, because it would be a new development added to a view that contains very little development, it would be a moderate to major impact on the views of nearby residents.	Conforms to VRM class objectives no additional mitigation would be required. The impact to would be minor to major for Segment ca-05 for local viewers.	Conforms to VRM class objectives no additional mitigation would be required. The Project would be a major new addition to the view that would be a moderate to major impact for local viewers.	Conforms to VRM class objectives no additional mitigation would be required. The Project would be a negligible to minor addition to the landscape, but would likely reach a moderate to major level for closer viewers.	Conforms to VRM class objectives no additional mitigation would be required. The Project would be a negligible to minor addition to the landscape, but would likely reach a moderate to major level for closer viewers and add to visual clutter.
Water Resources	Impacts to surface water or groundwater quantity or availability; impediments to floodplain function from channel alterations; impacts to water rights or water quality; violations of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act.	Same as p-15e	Except where floodplains are too extensive to be spanned between structures impacts should be long-term negligible using BMPs, APMs, or avoidance through design and placement of structures. Otherwise must comply with 404 permitting or Section 10 permitting to minimize impacts.	Same as p-15e	Same as p-15e	Same as ca-01	Same as ca-01	Same as ca-01	Same as ca-01

Table 4.20-6c Colorado River and California Zone Comparison of Impacts by Segment – x Segments East, Located in California

CHARACTERISTIC OR RESOURCE IMPACT		x-09	x-10	x-11	x-12	x-13
Segment length (miles)		0.8	1.3	2.1	1.3	2.0
Land ownership (miles)	BLM	-	-	-	-	-
	Reclamation	-	-	-	-	-
	Arizona State Trust	-	-	-	-	-
	California State	-	-	-	-	-
	Private	0.8	1.3	2.1	1.3	2.0
Ground disturbance	Short-term Acres	7.2	6.2	14.4	8.5	11.8
	Long-term Acres	3.0	4.5	7.5	9.3	4.6
Water Use	Total Gallons	216,008.4	343,656.5	556,146.4	340,059.5	529,396.7
CDCA Plan	VRM	Compliant	Compliant	Compliant	Compliant	Compliant
	Corridors	Yes	Yes	Yes	Yes	Yes
	Plan Conformance	Amendment required	Amendment required	Amendment required	Amendment required	Amendment required
Other Plan (Federal, county, municipal)	Plan Conformance	Yes	Yes	Yes	Yes	Yes
Air Quality and Climate Change	Air Quality Emissions are proportional to the Proposed Action based on length of each segment. Due to the length of each segment, the impact of individual segments on air quality may be negligible to minor. However, the cumulative impact of all project segments might have large total emissions, but the emissions are distributed across a long linear area. Climate Change is not available at this smaller scale.					
Geology, Minerals, and Soil Resources	Geological Hazards Minerals/Mining (access to known resources or claims) Soils	Earthquake risk long-term negligible; no mapped active faults. No active mines; negligible short-term potential for preclusion of access; Soil loss/erosion risk negligible to minor, short term to long term; adherence to APMs & BMPs reduces risks to negligible. Negligible disruption of sand transport or dunes during construction and operation.	Same as x-09	Same as x-09	Same as x-09	Same as x-09
Paleontological Resources	Potential Fossil Yield Classification	Unknown	Unknown	Unknown	Unknown	Unknown
Biological Resources (Vegetation Resources, Wildlife, including Special Status Species and Migratory Birds)	Loss of native habitat/communities; Noxious weeds; Special Status Species & animals); Increased risk of predation or electrocution re infrastructure; Displacement via construction; Displacement via human activity including	Spanned floodplain and canals west of the Colorado River, now agricultural, used by foraging and migrating birds, but risk of avian mortality due to collision with towers and lines.				

CHARACTERISTIC OR RESOURCE IMPACT		x-09	x-10	x-11	x-12	x-13
	recreation; Impacts to native habitat and designated management areas; and Migratory birds.					
Cultural Resources	Damage or loss of a cultural site or potential site under Federal or state registers; degradation of the setting for a cultural site where setting is significant to its listing eligibility; increased access leading to potential vandalism; disturbance of human remains	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 30.3%). Known site density: 0.0 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 0. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 60.8%). Known site density: 0.0 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 0. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 1 (cultural resources survey coverage: 1.5%). Known site density: 125.0 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 65. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 2 (cultural resources survey coverage: 4.9%). Known site density: 133.3 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 3. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 1 (cultural resources survey coverage: 3.3%). Known site density: 62.5 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 30. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from structures along this segment.
Issues of Concern to Indian Tribes	Existing and new access, native infrastructure and the interconnection of the cultural and natural environment, places of elevated spiritual important to tribes, the Colorado River, the treatment of human remains, and the disturbance of previously pristine landscapes.	No known concerns to Indian tribes.	No known concerns to Indian tribes.	Colorado River	No known concerns to Indian tribes.	No known concerns to Indian tribes.
Land Use	Land use authorizations and ROWs; Residential; Agricultural; Other (i.e., nuisance impacts)	See Alternatives 1 and 4K	See Alternatives 1E and 4N	See Alternatives 3 and 4L	See Alternatives 3, 4, and 1E	See Alternatives 4, 2E, and 3M
Grazing and Rangeland	Access to range or improvements; Loss of range relative to AUMs; Fragmentation of allotments; Degradation of range quality	See Alternatives 1 and 4K	See Alternatives 1E and 4N	See Alternatives 3 and 4L	See Alternatives 3, 4, and 1E	See Alternatives 4, 2E, and 3M

CHARACTERISTIC OR RESOURCE IMPACT		x-09	x-10	x-11	x-12	x-13
Recreation	Physical, access, use, or functional changes to established, designated, or planned recreation areas, resources, experiences, or activities; conflicts with Federal, state, or local policies; affect OHV designations, access, or routes; impacts to hunting access.	See Alternatives 1 and 4K	See Alternatives 1E and 4N	See Alternatives 3 and 4L	See Alternatives 3, 4, and 1E	See Alternatives 4, 2E, and 3M
Special Designations, Management Allocations, and Wilderness Resources	Conflict with goals, objectives & resources an area is designated to protect	See Alternatives 1 and 4K	See Alternatives 1E and 4N	See Alternatives 3 and 4L	See Alternatives 3, 4, and 1E	See Alternatives 4, 2E, and 3M
Noise	Exceedance of regulations or guideline; exposure of receptors to excessive noise levels; generate noise levels that pose a health risk.	2 NSR present, residences along Colorado River in Blythe, CA.	63 NSR present, all residences along the Colorado River in Blythe, CA.	8 NSR present, all residences along the Colorado River in Blythe, CA.	2 NSR present, rural residential area southwest of Blythe, CA.	2 NSR present, rural residential area near Blythe, CA.
Hazards and Hazardous Materials	Generation, use, handling, or disturbance of hazardous waste that: violates Federal, state, or local laws or regulations; poses a health or safety risk to public or environment; releases hazardous emissions; creates a safety hazard to public or private airstrips; or exposes workers, schools, or the public to hazardous materials.	Negligible risk with adherence to Federal, state, and local laws and regulations; BMPs, APMs, and a HMMP; and the Hazardous Materials Mitigation Sequence.	Same as x-09	Same as x-09	Same as x-09	Same as x--09
Public Health and Safety	Risks to public health, safety, utilities; fire or electrocution hazard; EMF emissions	With worker education programs, adherence to BMPS and APMs, risks for adverse impacts would be negligible to minor for all receptors. Impacts to public health and safety due to EMF during operations would be long-term negligible to minor.	Same as x-09	Same as x-09	Same as x-09	Same as x-09
Socioeconomics & Environmental Justice	Not available at this scale					

CHARACTERISTIC OR RESOURCE IMPACT		x-09	x-10	x-11	x-12	x-13
Traffic and Transportation	Increased roadway traffic; damage to roadways, access, or road systems; risk to aviation	All traffic and transportation risks reduced to negligible to minor with adherence to APMs, BMPs, and MMs TT-1 and TT-2.	Same as x-09	Same as x-09	Same as x-09	Same as x-09
Visual Resources	Conflicts with visual standards, ordinances, or policies established; major and unmitigated visual changes that degrade or disrupt views of scenic landscapes from highly sensitive viewing locations; VRM class objectives that would not be met requiring an RMP Amendment.	Conforms to VRM class objectives no additional mitigation would be required.	Conforms to VRM class objectives no additional mitigation would be required. The Project would be proportional to the surrounding landscape, thus would not dominate or be a major modification; however, because it would be a new development added to a view that contains very little development, it would be a moderate to major impact on the views of nearby residents.	Conforms to VRM class objectives no additional mitigation would be required.	Conforms to VRM class objectives no additional mitigation would be required.	Conforms to VRM class objectives no additional mitigation would be required.
Water Resources	Impacts to surface water or groundwater quantity or availability; impediments to floodplain function from channel alterations; impacts to water rights or water quality; violations of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act.	Except where floodplains are too extensive to be spanned between structures impacts should be long-term negligible using BMPs, APMs, or avoidance through design and placement of structures. Otherwise must comply with 404 permitting or Section 10 permitting to minimize impacts.	Same as x-09	Same as x-09	Same as x-09	Same as x-09

Table 4.20-6d Colorado River and California Zone Comparison of Impacts by Segment – x Segments West, Located in California

CHARACTERISTIC OR RESOURCE IMPACT		x-15	x-16	x-19
Segment length (miles)		1.4	2.3	1.0
Land ownership (miles)	BLM	1.4	2.0	1.0
	Reclamation	-	-	-
	Arizona State Trust	-	-	-
	California State	-	-	-
	Private	-	0.3	-
Ground disturbance	Short-term Acres	11.2	15.0	13.1
	Long-term Acres	5.3	7.6	5.9
Water Use	Total Gallons	367,298.0	595,571.3	278,440.5
CDCA Plan	VRM	Compliant	Compliant	Compliant
	Corridors	Yes	Yes	Yes
	Plan Conformance	Amendment required	Amendment required	Amendment required
Other Plans (Federal, county, municipal)	Plan Conformance	Yes	Yes	Yes
Air Quality and Climate Change	Air Quality Emissions are proportional to the Proposed Action based on length of each segment. Due to the length of each segment, the impact of individual segments on air quality may be negligible to minor. However, the cumulative impact of all project segments might have large total emissions, but the emissions are distributed across a long linear area. Climate Change is not available at this smaller scale.			
Geology, Minerals, and Soil Resources	Geological Hazards Minerals/Mining (access to known resources or claims) Soils	Earthquake risk long-term negligible; no mapped active faults. No active mines; negligible short-term potential for preclusion of access; Soil loss/erosion risk negligible to minor, short term to long term; adherence to APMs & BMPs reduces risks to negligible. Negligible disruption of sand transport or dunes during construction and operation.	Same as x-15	Negligible to minor impact on sand transport corridor and dunes during construction and operation
Paleontological Resources	Potential Fossil Yield Classification	High to unknown	High to unknown	Unknown
Biological Resources (Vegetation Resources, Wildlife, including Special Status Species and Migratory Birds)	Loss of native habitat/communities; Noxious weeds; Special Status Species & animals); Increased risk of predation or electrocution re infrastructure; Displacement via construction; Displacement via human activity including recreation; Impacts to native habitat and designated management areas; and Migratory birds.	Potential long-term impact to active windblown sand depositional areas with resulting potential impact to Harwood's eriastrum. Potential impacts to 2.7 acres of big galleta Alliance on BLM land.	Potential long-term impact to active windblown sand depositional areas with resulting potential impact to Harwood's eriastrum.	Potential long-term impact to active windblown sand depositional areas with resulting potential impact to Harwood's eriastrum.

CHARACTERISTIC OR RESOURCE IMPACT		x-15	x-16	x-19
Cultural Resources	Damage or loss of a cultural site or potential site under Federal or state registers; degradation of the setting for a cultural site where setting is significant to its listing eligibility; increased access leading to potential vandalism; disturbance of human remains.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 62.9%). Known site density: 0.0 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 0. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 2 (cultural resources survey coverage: 13.3%). Known site density: 26.3 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 16. Cultural resources potentially sensitive to visual considerations are located within the 1-mile corridor. No known indirect visual impacts to known historic properties from structures along this segment.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 3 (cultural resources survey coverage: 100.0%). Known site density: 16.5 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 3. No known historic properties sensitive to visual considerations. No known indirect visual impacts to known historic properties from structures along this segment.
Issues of Concern to Indian Tribes	Existing and new access, native infrastructure and the interconnection of the cultural and natural environment, places of elevated spiritual important to tribes, the Colorado River, the treatment of human remains, and the disturbance of previously pristine landscapes.	Native infrastructure and the interconnectedness of the cultural and natural environment; places of spiritual importance; Colorado River	Native infrastructure and the interconnectedness of the cultural and natural environment.	No known concerns to Indian tribes.
Land Use	Land use authorizations and ROWs; Residential; Agricultural; Other (i.e., nuisance impacts)	See Alternative 2	See Alternative 2	Within or adjacent to existing or approved but not yet constructed solar energy facilities (minor short-term impact).
Grazing and Rangeland	Access to range or improvements; Loss of range relative to AUMs; Fragmentation of allotments; Degradation of range quality	See Alternative 2	See Alternative 2	See Alternatives 1, 2, 3, and 4
Recreation	Physical, access, use, or functional changes to established, designated, or planned recreation areas, resources, experiences, or activities; conflicts with Federal, state, or local policies; affect OHV designations, access, or routes; impacts to hunting access.	See Alternative 2	See Alternative 2	See Alternatives 1, 2, 3, and 4
Special Designations, Management Allocations, and Wilderness Resources	Conflict with goals, objectives & resources an area is designated to protect	See Alternative 2	See Alternative 2	See Alternatives 1, 2, 3, and 4
Noise	Exceedance of regulations or guideline; exposure of receptors to excessive noise levels; generate noise levels that pose a health risk.	No NSR present. See Alternative 2	No NSR present. See Alternative 2	No NSR present. See Alternatives 1, 2, 3, and 4

CHARACTERISTIC OR RESOURCE IMPACT		x-15	x-16	x-19
Hazards and Hazardous Materials	Generation, use, handling, or disturbance of hazardous waste that: violates Federal, state, or local laws or regulations; poses a health or safety risk to public or environment; releases hazardous emissions; creates a safety hazard to public or private airstrips; or exposes workers, schools, or the public to hazardous materials.	Negligible risk with adherence to Federal, state, and local laws and regulations; BMPs, APMs, and a HMMP; and the Hazardous Materials Mitigation Sequence.	Same as x-16	Same as x-16
Public Health and Safety	Risks to public health, safety, utilities; fire or electrocution hazard; EMF emissions	Same as x-09	Same as x-09	Same as x-09
Socioeconomics & Environmental Justice	Not available at this scale			
Traffic and Transportation	Increased roadway traffic; damage to roadways, access, or road systems; risk to aviation	All traffic and transportation risks reduced to negligible to minor with adherence to APMs, BMPs, and MMs TT-1 and TT-2.	Same as x-15	Same as x-15
Visual Resources	Conflicts with visual standards, ordinances, or policies established; major and unmitigated visual changes that degrade or disrupt views of scenic landscapes from highly sensitive viewing locations; VRM class objectives that would not be met requiring an RMP Amendment.	Conforms to VRM class objectives no additional mitigation would be required.	Conforms to VRM class objectives no additional mitigation would be required.	Conforms to VRM class objectives no additional mitigation would be required.
Water Resources	Impacts to surface water or groundwater quantity or availability; impediments to floodplain function from channel alterations; impacts to water rights or water quality; violations of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act.	Same as x-09	Same as x-09	Same as x-09

4.20.4 Comparison of Impacts by Action Alternative Route and Subalternative

The alternative routes include: Alternative 1 – I-10 Route; Alternative 2 – BLM Utility Corridor Route; Alternative 3 – Avoidance Route; and Alternative 4 – Public Lands Emphasis Route. Subalternatives within each zone consisting of one or more segments were also developed that can be chosen to combine with an alternative route.

Tables 4.20-7 through 4.20-12 provide summaries of the impacts of the combined segments by Alternative and Subalternative.

Table 4.20-7 Proposed Action Impact Summary

ELEMENT OR RESOURCE	INDICATOR	PROPOSED ACTION
Length	Miles	114.3
Jurisdiction (miles)	BLM	56.5
	Reclamation	1.5
	USFWS	24.9
	DOD	0.2
	Arizona State Trust	8.1
	Private	23.1
Disturbance	Short-term Acres	709.1
	Long-term Acres	410.0
Water Use	Total Gallons	56,766,542.6
BLM RMP Conformance	VRM	Class change required for 8 segments
	Corridors	Conform
	RMP Conformance	Conform
Air Quality and Climate Change	Criteria Air Pollutants – Construction	Emissions in CA and Phoenix nonattainment area are well below applicable significance thresholds; would not exceed NAAQS or CAAQS
	CO	35.1 tpy
	NO_x	95.7 tpy
	PM_{10}	46.7 tpy
	$PM_{2.5}$	8.8 tpy
	SO_2	0.2 tpy
	VOC	8.4 tpy
	CO_{2e}	31,723 tpy
	GHGs – Construction CO_{2e}	~10,600 tpy (significance threshold = 100,000 tons)
	Criteria Air Pollutants – O&M	Would not exceed NAAQS or CAAQS
	GHGs – SF_6 – O&M	~835.7 tons CO_{2e}/year

ELEMENT OR RESOURCE	INDICATOR	PROPOSED ACTION
Geology, Minerals, and Soil Resources	Geological Hazards Minerals/Mining (access to known resources or claims) Soils disruption of sand transport and dunes	Earthquake risk long-term negligible; no mapped active faults. No active mines; negligible short-term potential for preclusion of access; Soil loss/erosion risk negligible to minor, short term to long term; adherence to APMs & BMPs reduces risks to negligible. Negligible disruption of sand transport or dunes during construction and operation.
Paleontological Resources	Potential damage to known paleontological resources or formations with potential to contain paleontological resources	Negligible to minor impacts following BLM mitigation guidance, APMs, and BMPs
Biological Resources (Vegetation Resources, Wildlife, including Special Status Species	Loss of native habitat/communities	Some minor long-term habitat loss for structures and access roads, but entire Project would occur in an area where linear facilities and roads already exist. Short- and long-term impacts from clearing of temporary use areas pending restoration but impacts reduced due to adjacency of existing disturbances. Protected microphyll washes and up to 1.8 acre of total wash habitat would be crossed but would be spanned through micrositing.
and Migratory Birds)	Noxious weeds	Negligible to minor impact with APMs and BMPs but increased abundance of existing invasives already present.
	Special Status Plant Species	Project would cross 0.6 mile of Harwood's eriastrum habitat. Negligible to minor impact with APMs and BMPs.
	Increased predation potential or electrocution risk	Electrocution risk for raptors reduced by APMs, BMPs, and APLIC standards. Increased predation from raptors due to artificial perch sites; minimized by use of APMs and BMPs. Increased hazard of collision at the Colorado River crossing and over agricultural lands would be reduced by matching structure spacing and conductor heights with existing facilities.
	Displacement via construction	Loss of habitat, crushing under vehicles, displacement due to disturbance. Minor short-term construction impact to bighorn sheep in Copper Bottom Pass. Impacts minimized through use of APMs and BMPs.
	Increased access to remote areas resulting in displacement via human activity including recreation	Negligible long-term impacts to wildlife and habitats by facilitating increased recreational access to remote areas.
	Impacts to native wildlife habitat and designated management areas	Project would cross approximately 25 miles of quality habitat for Sonoran desert tortoise, 0.6 mile of Mojave fringe-toed lizard habitat, and is within habitat used by reintroduced Sonoran pronghorn. Passes through Cunningham Peak, a bighorn sheep lambing area. Impacts to wildlife habitats minimized through use of APMs and BMPs. Major, unmitigable, adverse effect to management of Kofa NWR for wildlife, including Sonoran pronghorn and bighorn sheep.

ELEMENT OR RESOURCE	INDICATOR	PROPOSED ACTION
Biological Resources Continued	Migratory birds	Negligible to minor impacts from noise of construction causing displacement, increased predation from raptors, loss of nests, risk of collision with towers and lines (especially at Colorado River crossing and over agricultural lands); minimized by use of APMs and BMPs
	Special Status Animal Species	Sonoran pronghorn potential major impact on Kofa NWR. Crosses Mojave and Sonoran desert tortoise habitat, Mojave fringe-toed lizard potential impacts (crushing, displacement) from construction and increased predation by ravens, disturbance within bighorn sheep habitat; minimized by APMs and BMPs.
Cultural Resources	Damage or loss of a cultural site or potential site under Federal or state registers; degradation of the setting for a cultural site where setting is significant to its listing eligibility; increased access leading to potential vandalism; disturbance of human remains	Known NRHP-eligible sites or sites requiring NRHP evaluation: 66 (Percentage of cultural resources survey coverage: 39.3%). Known site density: 11.3 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 164. Key resources include trails, intaglios, and prehistoric habitation sites with potential human remains, particularly along Segments p-17 and p-18 that cross the eastern base of the Palo Verde Mesa. Areas of Tribal concern (NRHP-listed Ripley Intaglio Site, NRHP-listed Mule Tank Discontiguous Rock Art District, Limekiln Wash Intaglio Site, and Indian Well Site) are in the vicinity of this proposed route. Continued consultation with Indian tribes and/or other interested parties potentially may identify additional resources of concern.
Issues of Concern to Indian Tribes	Existing and new access	Potential impacts to areas of Indian tribal concern due to new access or access restrictions will be studied in an access analysis that will be a required stipulation of the PA.
	Native infrastructure and the interconnectedness of the landscape.	12 segments contain relevant concerns, including trails.
	Places of elevated spiritual importance	Five segments contain relevant concerns, including intaglio or petroglyph sites. Two segments pass through a prehistoric cultural landscape that include the Mule Tank Discontiguous Rock Art District.
	Colorado River	Two segments cross the Colorado River; multiple tribes expressed concern about the Colorado River, and its influence on their spiritual belief and cultural history.
	Treatment of human remains	One segment includes a site with calcined bone consistent with a human cremation. Indian tribes have indicated that human remains should not be disturbed and should remain in place.
	Intrusion on pristine landscapes	No known concerns to Indian tribes

ELEMENT OR RESOURCE	INDICATOR	PROPOSED ACTION
Land Use	Land use authorizations and ROWs	No changes in ownership; short-term conflict with access to ROWs during construction; minor short-term displacement to recreation and grazing during construction; non-compliance with CDCA Plan; minor with Quartzsite Plan Major, unmitigable, adverse effect to management of Kofa NWR for wildlife.
	Residential	Short-term, minor impact during construction, if any; minor impact to residential use in California
	Agricultural	Short-term, minor impact during construction; potential soil erosion or changes in drainage patterns; negligible change to agricultural character in Palo Verde Valley Area; negligible loss of ag use in California; may preclude aerial spraying in some areas (minor impact)
	Other (i.e., nuisance impacts)	Short-term impact during construction, if any; noise from corona effect and EMF health issues
Grazing and Rangeland	Access to range or improvements; Loss of range relative to AUMs; Fragmentation of allotments; Degradation of range quality	Short-term minor loss of access or temporary fragmentation of allotments including ASLD and HMA during construction. Moderate short-term effects on improvements (fencing and water). Short-term degradation due to weeds, prevented by implementation of the Noxious and Invasive Species Control Plan. Negligible short-term loss of AUMs and long-term effects. Short-term impacts from helicopter use and fly yards on the Cibola-Trigo herd area and HMA.
Recreation	Physical, access, use, or functional changes to established, designated, or planned recreation areas, resources, experiences, or activities; conflicts with Federal, state, or local policies; affect OHV designations, access, or routes; impacts to hunting access.	Negligible to minor effects to recreation areas short term due to access restrictions; negligible effects long term as already impacted by DPV1 line. Negligible to moderate effects to OHV route and APT short term, negligible long term, with MMs. Negligible effects to hunting.
Special Designations, Management Allocations, and Wilderness Resources	Conflict with goals, objectives & resources an area is designated to protect	Overall impacts would be long-term and negligible to minor, with potential indirect effects that may occur to the character of the area or increase access, and some acreage of lands with wilderness characteristics would be lost; this acreage loss would be negligible and would not affect the lands with wilderness characteristics criteria of affected polygons.
Noise	Exceedance of regulations or guideline; exposure of receptors to excessive noise levels; generate noise levels that pose a health risk.	Noise Sensitive Receptors located primarily around Quartzsite and Blythe. Noise impacts would be short term and negligible to minor during construction and operations.
Hazards and Hazardous Materials	Generation, use, handling, or disturbance of hazardous waste that: violates Federal, state, or local laws or	Negligible risk with adherence to Federal, state, and local laws and regulations; BMPs, APMs, and a HMMP; and the Hazardous Materials Mitigation Sequence.

ELEMENT OR RESOURCE	INDICATOR	PROPOSED ACTION
	regulations; poses a health or safety risk to public or environment; releases hazardous emissions; creates a safety hazard to public or private airstrips; or exposes workers, schools, or the public to hazardous materials.	
Public Health and Safety	Risks to public health, safety, utilities; fire or electrocution hazard; EMF emissions	With worker education programs, adherence to BMPS and APMs, risks for adverse impacts would be negligible to minor for all receptors. Impacts to public health and safety due to EMF during operations would be long-term negligible to minor.
Socioeconomics & Environmental Justice	Employment; Tax collection & revenue; Population or population displacement; Non-market values and ecosystem services; Revenue from recreation sector; Local economy; Reductions in property values; EJ Populations; disproportionate adverse impacts to EJ populations	Short-term increase in employment; increased revenue from taxes short and long term; short-term negligible impacts to recreation sector, non-market values. Short-term negligible impacts to property values. Negligible long-term impact to population. Local economic impacts would include short-term increase in employment and long-term facilitation of renewable energy generation facilities. EJ populations present but would not experience disproportionate adverse impacts.
Traffic and Transportation	Increased roadway traffic; damage to roadways, access, or road systems; risk to aviation	All traffic and transportation risks reduced to negligible to minor with adherence to APMs, BMPs, and MM-TT-01 and MM-TT-02.
Visual Resources	Conflicts with visual standards, ordinances, or policies established; major and unmitigated visual changes that degrade or disrupt views of scenic landscapes from highly sensitive viewing locations; VRM class objectives that would not be met requiring an RMP Amendment.	The Proposed Action would be an impact along I-10 in the eastern portion of the Project Area approaching and between the two I-10 crossings of Segment p-01. Scenic quality in this area is rated B and sensitivity is moderate. At the crossings, the infrastructure would appear as a major modification and dominate views for travelers for a few seconds.
Water Resources	Impacts to surface water or groundwater quantity or availability; impediments to floodplain function from channel alterations; impacts to water rights or water quality; violations of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act.	Except where floodplains are too extensive to be spanned between structures impacts should be long-term negligible using BMPs, APMs, or avoidance through design and placement of structures. Otherwise must comply with 404 permitting or Section 10 permitting to minimize impacts.

Sources: Jurisdiction from Table 2.2-1; Disturbance from Table 2.2-14.

Table 4.20-8 Alternative 1 and Subalternative Impact Summary

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 1	1A	1B	1C	1D	1E
Land ownership (miles)	BLM	58.8	-	-	-	-	-
	Reclamation	6.4	-	-	-	-	-
	Arizona State Trust	19.4	-	-	-	-	-
	Private	25.6	-	-	-	-	-
	Indian Lands	1.4	-	-	-	-	-
	Total Length	111.6	9.9	9.1	13.9	0.6	9.2
Ground disturbance	Short-term Acres	648.3	51.9	46.8	75.8	4.2	59.8
	Long-term Acres	390.3	33.8	31.5	50.5	2.2	37.3
Water Use	Total Gallons	56,082,251.9	2,496,367.2	2,310,422.9	3,677,114.6	164,093.0	2,438,500.8
BLM RMP conformance	VRM	Amendment required for 1 segment	Amendment required for 2 segments	Amendment required for 1 segment	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1
	Corridors	Except 1 segment	Except 2 segments	Except 2 segments	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1
	RMP Conformance	Amendments required (YFO)	Amendments required (YFO)	Amendments required (YFO)	Amendments required (YFO and Lake Havasu)	Amendments required (YFO)	Amendments required (YFO)
	CDCA Plan	Amendment required	Amendment required	Amendment required	Amendment required	Amendment required	Amendment required
Other Plan conformance (Federal, county, municipal)	Plan Conformance	Not consistent with La Paz County Zoning Plan and Town of Quartzsite General Plan	Not consistent with La Paz County Zoning Plan and Town of Quartzsite General Plan	Not consistent with La Paz County Zoning Plan and Town of Quartzsite General Plan	Not consistent with La Paz County Zoning Plan and Town of Quartzsite General Plan	Not consistent with La Paz County Zoning Plan and Town of Quartzsite General Plan	Not consistent with La Paz County Zoning Plan and Town of Quartzsite General Plan
Air Quality and Climate Change	Criteria Air Pollutants – Construction	Same as Proposed Action	Same as Proposed Action				
	CO	36.0 tpy	Proportional to Total Length				
	NO_x	98.0 tpy	Proportional to Total Length				
	PM_{10}	47.8 tpy	Proportional to Total Length				
	$PM_{2.5}$	9.0 tpy	Proportional to Total Length				
	SO_2	0.2 tpy	Proportional to Total Length				
	VOC	8.6 tpy	Proportional to Total Length				
	CO_{2e}	32,500 tpy	Proportional to Total Length				
	GHGs – Construction CO_{2e}	Same as Proposed Action	Same as Proposed Action				
	Criteria Air Pollutants – O&M	Would not exceed NAAQS or CAAQS	Would not exceed NAAQS or CAAQS				
	GHGs – SF_6 – O&M	Same as Proposed Action	Same as Proposed Action				
Geology, Minerals, and Soil Resources	Geological Hazards Minerals/Mining (access to known resources or claims) Soils	Uses segments ca-07, ca-09, and x-19 which would have negligible to minor impact on sand transport and dunes during construction and operation	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 1	1A	1B	1C	1D	1E
Paleontological Resources	Potential damage to known paleontological resources or formations with potential to contain paleontological resources	Same as Proposed Action	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1
Biological Resources (Vegetation Resources, Wildlife, including Special Status Species and Migratory Birds)	Loss of native habitat/communities; Noxious weeds; Special Status Species & animals); Increased risk of predation or electrocution re infrastructure; Displacement via construction; Displacement via human activity including recreation; Impacts to native wildlife habitat and designated management areas; and Migratory birds.	In areas where no linear facilities and few roads exist these impacts would be moderate. Protected microphyll washes and up to 0.3 acre of total wash habitat would be crossed but would be spanned through micrositing. Negligible to minor long-term impacts in undeveloped areas due to facilitating increased abundance of non-native plants, especially in dune habitats. APMs and BMPs would reduce impact. Project would cross 3.5 miles of Harwood's eriastrum habitat; measures would protect individuals and maintain sand transport. Disturbance could occur on 23 acres of suitable habitat. Minor to moderate impact with APMs and BMPs. The collision risk at the Colorado River crossing is higher than under the Proposed Action because the crossing is not adjacent to existing facilities. Negligible impacts to bighorn sheep. Negligible long-term impacts to wildlife and habitats by facilitating increased recreational access to remote areas. Project would cross only a minor amount of mostly degraded habitat for Sonoran desert tortoise and is not within Sonoran pronghorn habitat. Negligible impacts to bighorn sheep. Minor short- and long-term impact to Mojave fringe-toed lizard due to possible mortality by Project activities	Slightly greater, but still negligible impact to native vegetation communities and general wildlife habitat compared to Alternative 1.		Impacts to wildlife and vegetation the same as for Alternative 1.		

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 1	1A	1B	1C	1D	1E
		and habitat impacts on 4 miles of habitat. Would not cross Kofa NWR. Additional hazard at the Colorado River crossing because there are no existing structures to match.					
Cultural Resources	Damage or loss of a cultural site or potential site under federal or state registers; degradation of the setting for a cultural site where setting is significant to its listing eligibility; increased access leading to potential vandalism; disturbance of human remains	Known NRHP-eligible sites or sites requiring NRHP evaluation: 23 (cultural resources survey coverage: 30.7%). Known site density: 5.0 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 75. Key resources projected to occur include trails and intaglios.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 1 (cultural resources survey coverage: 7.6%). Known site density: 16.6 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 26. Subalternative 1A would result in a reduced visual impact and less potential to affect cultural resources by ground disturbance compared to Alternative 1.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 2 (cultural resources survey coverage: 2.5%). Known site density: 54.1 sites per 100 acres[1]. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 82. Subalternative 1B results in a greater visual impact and a greater potential to affect cultural resources by ground disturbance compared to Alternative 1.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 2 (cultural resources survey coverage: 2.0%). Known site density: 30.3 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 102. Subalternative 1C results in a greater visual impact and a greater potential to affect cultural resources by ground disturbance compared to Alternative 1.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 2 (cultural resources survey coverage: 89.6%). Known site density: 22.2 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 2. Subalternative 1D would result in a reduced visual impact and less potential to affect cultural resources by ground disturbance compared to Alternative 1.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 10.6%). Known site density: 46.4 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 104. Subalternative 1E results in a greater visual impact and a greater potential to affect cultural resources by ground disturbance compared to Alternative 1.
Issues of Concern to Indian Tribes	Existing and new access, native infrastructure and the interconnection of the cultural and natural environment, places of elevated spiritual important to tribes, the Colorado River, the treatment of human remains, and the disturbance of previously pristine landscapes.	Native infrastructure and the interconnectedness of the cultural and natural environment, places of elevated spiritual importance, and the Colorado River.	Native infrastructure and the interconnectedness of the cultural and natural environment	Native infrastructure and the interconnectedness of the cultural and natural environment	No known concerns to Indian tribes	No known concerns to Indian tribes	No known concerns to Indian tribes
Land Use	Land use authorizations and ROWs; Residential; Agricultural; Other (i.e., nuisance impacts)	Same as Proposed Action except Alternative 1 would avoid the Kofa NWR and the YPG, would cross through more ASLD land, would affect more residential land and NRCS-classified farmland in California, and affect more solar facilities. It would not be consistent with Town of Quartzsite or La Paz County plans. In California, it would not be in compliance with the CDCA Plan so would require an amendment.	One additional RMP ROW amendment and one additional VRM amendment than Alternative 1.	One additional RMP ROW amendment than Alternative 1.	One additional VRM amendment than Alternative 1.	Same as Alternative 1	Same as Alternative 1

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 1	1A	1B	1C	1D	1E
Grazing and Rangeland	Access to range or improvements; Loss of range relative to AUMs; Fragmentation of allotments; Degradation of range quality	Would impede access to three stock tanks versus two under the Proposed Action. Otherwise the Same as Proposed Action. No helicopter fly yards and no measurable impact to grazing from helicopter use.	Same as Proposed Action	Same as Proposed Action with MM-GR-1 mitigation	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1
Recreation	Physical, access, use, or functional changes to established, designated, or planned recreation areas, resources, experiences, or activities; conflicts with Federal, state, or local policies; affect OHV designations, access, or routes; impacts to hunting access.	Greater impacts to long-term recreation where route varies from Proposed Action as power lines would be new and may impact the quality of the recreation experience. Minor to major effects to La Posa LTVA, Dome Rock Camping Area, and the Ehrenberg Sandbowl OHV area. Kofa NWR would not be crossed. Otherwise the Same as Proposed Action.	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1
Special Designations, Management Allocations, and Wilderness Resources	Conflict with goals, objectives & resources an area is designated to protect	Same as Proposed Action	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1
Noise	Exceedance of regulations or guideline; exposure of receptors to excessive noise levels; generate noise levels that pose a health risk.	Although there would be a difference in number of NSR, impacts would be the same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
Hazards and Hazardous Materials	Generation, use, handling, or disturbance of hazardous waste that: violates Federal, state, or local laws or regulations; poses a health or safety risk to public or environment; releases hazardous emissions; creates a safety hazard to public or private airstrips; or exposes workers, schools, or the public to hazardous materials.	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
Public Health and Safety	Risks to public health, safety, utilities; fire or electrocution hazard; EMF emissions	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
Socioeconomics & Environmental Justice	Employment; Tax collection & revenue; Population or population displacement; Non-	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 1	1A	1B	1C	1D	1E
	market values and ecosystem services; Revenue from recreation sector; Local economy; Reductions in property values; EJ Populations; disproportionate adverse impacts to EJ populations						
Traffic and Transportation	Increased roadway traffic; damage to roadways, access, or road systems; risk to aviation	Alternative 1 would be within 0.3-mile of the Cyr Aviation Airport. The aviation safety risk associated with the Cyr Aviation Airport would be reduced to minor to moderate. Structures and lines in the Plomosa or Dome Rock Mountains would pose a minor to moderate long-term aviation hazard to AGFD aircraft; with MM-TT-02 this impact would be reduced to minor and long term.	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Proposed Action
Visual Resources	Conflicts with visual standards, ordinances, or policies established; major and unmitigated visual changes that degrade or disrupt views of scenic landscapes from highly sensitive viewing locations; VRM class objectives that would not be met requiring an RMP Amendment.	Impacts to viewers along I-10 would be minor to moderate. Additionally, there are larger areas of higher scenic quality south of I-10 than there are to the north, meaning that viewers along I-10 attracted to the distant scenic views to the south would be viewing these areas with the Project in the intervening landscape. In areas of moderate impact, the visibility of distant scenic quality A areas may further increase the adverse visual impact of the Project, notably Segment i-04. Addition of the transmission line would add a visible and, in many cases, noticeable development. However, most of the areas crossing BLM-managed public land would meet established VRM class objectives.	Subalternative 1A would further remove the Project from proximity to I-10 viewers and reducing visual impacts.	Subalternative 1B would further remove the Project from proximity to I-10 viewers and reducing visual impacts.	Impacts would be similar to Alternative 1 with two additional crossings of I-10, increasing impacts in those locations.	Under Subalternative 1D, impacts to I-10 travelers would be minor.	Subalternative 1E would be further south of I-10 reducing the visual impacts.

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 1	1A	1B	1C	1D	1E
Water Resources	Impacts to surface water or groundwater quantity or availability; impediments to floodplain function from channel alterations; impacts to water rights or water quality; violations of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act.	Same as Proposed Action	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1

[1]Site density calculations include sites that have been previously determined or recommended as ineligible for the NRHP. In cases where the projected counts of NRHP-eligible or site of unknown NRHP eligibility are 0 and the site density is greater than 0, the site density calculation includes NRHP ineligible sites.

Table 4.20-9 Alternative 2 and Subalternatives Impact Summary

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 2	2A	2B	2C	2D	2E
Land ownership (miles)	BLM	80.1	-	-	-	-	-
	Reclamation	1.7	-	-	-	-	-
	DOD	0.2	-	-	-	-	-
	Arizona State Trust	17.6	-	-	-	-	-
	Private	26.2	-	-	-	-	-
	Indian Lands	-	-	-	-	-	-
	Total Length	125.8	32.0	13.5	6.0	4.3	5.4
Ground disturbance	Short-term Acres	754.8	165.2	75.4	85.9	24.7	33.0
	Long-term Acres	462.8	111.1	49.4	28.0	16.2	16.6
Water Use	Total Gallons	59,723,668.3	33,649,493.7	3,651,357.7	1,566,512.8	1,166,604.1	1,423,198.5
BLM RMP conformance	VRM	Amendments required for five segments	Amendments required for eight segments	Amendments required for six segments	Amendments required for eight segments	Amendments required for six segments	Amendments required for nine segments.
	Corridors	Except one segment	Except two segments	Except two segments	Except four segments	Same as Alternative 2	Same as Alternative 2
	RMP Conformance	Amendments required (YFO)	Amendments required (YFO)	Amendments required (YFO)	Amendments required (YFO)	Amendments required (YFO)	Amendments required (YFO)
	CDCA Plan	Amendment required	Amendment required	Amendment required	Amendment required	Amendment required	Amendment required
Other Plan conformance (Federal, county, municipal)	Plan Conformance	Not consistent with La Paz County Zoning Plan and Town of Quartzsite General Plan	Not consistent with La Paz County Zoning Plan and Town of Quartzsite General Plan	Not consistent with La Paz County Zoning Plan and Town of Quartzsite General Plan	Not consistent with La Paz County Zoning Plan and Town of Quartzsite General Plan	Not consistent with La Paz County Zoning Plan and Town of Quartzsite General Plan	Not consistent with La Paz County Zoning Plan and Town of Quartzsite General Plan

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 2	2A	2B	2C	2D	2E
Air Quality and Climate Change	Criteria Air Pollutants – Const.	Same as Proposed Action	Same as Proposed Action				
	CO	39.6	Proportional to Total Length				
	NO_x	107.8	Proportional to Total Length				
	PM_{10}	52.6	Proportional to Total Length				
	$PM_{2.5}$	9.9	Proportional to Total Length				
	SO_2	0.2	Proportional to Total Length				
	VOC	9.5	Proportional to Total Length				
Air Quality and Climate Change Cont.	CO_{2e}	35,747	Proportional to Total Length				
	GHGs – Construction CO_{2e}	Same as Proposed Action	Same as Proposed Action				
	Criteria Air Pollutants – O&M	Would not exceed NAAQS or CAAQS	Would not exceed NAAQS or CAAQS				
	GHGs – SF_6 – O&M	Same as Proposed Action	Same as Proposed Action				
Geology, Minerals, and Soil Resources	Geological Hazards Minerals/Mining (access to known resources or claims) Soils	Uses segments ca-07, ca-09, and x-19 which would have negligible to minor impact on sand transport and dunes during construction and operation	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2
Paleontological Resources	Potential damage to known paleontological resources or formations with potential to contain paleontological resources	Potentially increased impacts from Proposed Action with three segments having high to very high PFYC – negligible to minor long-term impacts with mitigations	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2
Biological Resources (Vegetation Resources, Wildlife, including Special Status Species and Migratory Birds)	Loss of native habitat/communities; Noxious weeds; Special Status Species & animals); Increased risk of predation or electrocution re infrastructure; Displacement via construction; Displacement via human activity including recreation; Impacts to native habitat and	In areas where no linear facilities and few roads exist these impacts would be moderate. Protected microphyll washes and up to 0.8 acre of total wash habitat would be crossed but would be spanned through micrositing Minor long-term impacts in undeveloped areas due to facilitating increased abundance of non-native plants, especially in dune habitats. APMs and BMPs would reduce impact. Project would cross 7 miles of Harwood's eriastrum habitat;	Subalternative 2 would avoid potential disturbance associated with Segment p-01 at a developed wildlife water in the Big Horn Mountains that may be used by bighorn sheep; and avoid crossing a bighorn sheep dispersal corridor between Burnt Mountain and the Big Horn Mountains.	Overall substantially similar to Alternative 2	The increased human presence associated with constructing and operating the line could interfere with wildlife use of the developed wildlife water in Johnson Canyon. Development of Subalternative 2C could increase public access into remote habitats, and could permanently alter the character and function of the area for wildlife. Subalternative 2C would result in substantially more impacts to biological resources than Alternative 2, which is parallel to existing development through Copper Bottom Pass.	Overall substantially similar to Alternative 2	Overall substantially similar to Alternative 2

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 2	2A	2B	2C	2D	2E
	designated management areas; and Migratory birds.	measures would protect individuals and maintain sand transport. Predation potential and electrocution risk similar to the Proposed Action. Displacement similar to the Proposed Action. Negligible long-term impacts to wildlife and habitats by facilitating increased recreational access to remote areas. Minor impact on Sonoran desert tortoise habitat, and negligible impact on Sonoran pronghorn. Avoids Mojave desert tortoise habitat. Passes through Cunningham Peak, a bighorn sheep lambing area. Impacts to wildlife habitats minimized through use of APMs and BMPs. Avoids the Kofa NWR. Migratory birds similar to Proposed Action. Increased, minor short- and long-term impact to Mojave fringe-toed lizard due to possible mortality by Project activities and habitat impacts on 4 miles of habitat.					
Cultural Resources	Damage or loss of a cultural site or potential site under Federal or state registers; degradation of the setting for a cultural site where setting is significant to its listing eligibility; increased access leading to potential vandalism; disturbance of human remains.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 50 (cultural resources survey coverage: 32.5%). Known site density: 7.8 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 150. Key resources projected to occur include trails and intaglios. Areas of Indian Tribal concern (NRHP-listed Ripley Intaglio Site and Limekiln Wash Intaglio Site) are in the vicinity of this alternative route. Continued consultation with Indian Tribes and/or other interested parties potentially may identify additional resources of concern.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 5.4%). Known site density: 4.7 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 37. Subalternative 2A would result in a greater visual impact but a comparable amount of ground disturbance compared to Alternative 2.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 5 (cultural resources survey coverage: 12.7%). Known site density: 23.1 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 40. Subalternative 2B would result in a greater visual impact and a greater potential to affect cultural resources by ground disturbance compared with Alternative 2.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 29.9%). Known site density: 7.7 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 10. Subalternative 2C has a higher potential to affect cultural resources based on projected site counts and the disturbance footprint, as compared to Alternative 2.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 1 (cultural resources survey coverage: 15.6%). Known site density: 12.0 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 6. Subalternative 2D would result in a greater visual impact but a reduced potential to affect cultural resources by ground disturbance compared to Alternative 2.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 7.6 (cultural resources survey coverage: 7.6%). Known site density: 40.0 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 53. Subalternative 2E would result in a greater potential to affect cultural resources by ground disturbance compared to Alternative 2.

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 2	2A	2B	2C	2D	2E
Issues of Concern to Indian Tribes	Existing and new access, native infrastructure and the interconnection of the cultural and natural environment, places of elevated spiritual important to tribes, the Colorado River, the treatment of human remains, and the disturbance of previously pristine landscapes.	Native infrastructure and the interconnectedness of the cultural and natural environment, places of elevated spiritual importance, and the Colorado River.	Native infrastructure and the interconnectedness of the cultural and natural environment; places of elevated spiritual importance.	Native infrastructure and the interconnectedness of the cultural and natural environment.	Native infrastructure and the interconnectedness of the cultural and natural environment; intrusion on pristine landscapes.	Native infrastructure and the interconnectedness of the cultural and natural environment.	Native infrastructure and the interconnectedness of the cultural and natural environment.
Land Use	Land use authorizations and ROWs; Residential; Agricultural; Other (i.e., nuisance impacts)	Same as the Proposed Action except inconsistent with La Paz County Zoning Plan and possibly the Quartzsite General Plan. Avoids the Kofa NWR. Affects greater number of solar facilities. One ROW RMP amendment required and five VRM RMP amendments. In California, it would not be in compliance with the CDCA Plan so would require an amendment.	Passes through renewable energy development avoidance area and include more NRCS-classified farmland in CA. Would require two RMP ROW amendments and eight VRM RMP amendments. Otherwise similar to Alternative 2.	Would require two RMP ROW amendments and six VRM RMP amendments. Otherwise similar to Alternative 2.	Would require four RMP ROW amendments and eight VRM RMP amendments. Otherwise similar to Alternative 2.	Would require six VRM RMP amendments. Otherwise similar to Alternative 2.	Would require nine VRM RMP amendments and two RMP ROW amendments.
Grazing and Rangeland	Access to range or improvements; Loss of range relative to UMs; Fragmentation of allotments; Degradation of range quality	Same as Alternative 1	No impediments to any stock tanks. Otherwise the Same as Proposed Action.	Same as Proposed Action.	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2
Recreation	Physical, access, use, or functional changes to established, designated, or planned recreation areas, resources, experiences, or activities; conflicts with Federal, state, or local policies; affect OHV designations, access, or routes; impacts to hunting access.	Long-term recreation quality similar to Proposed Action except in Quartzsite Zone where powerline would be new to the landscape (negligible to minor). Two Alternative 2 segments would cross the La Posa LTVA (minor to moderate impact), but, by comparison to Alternative 1, Dome Rock Camping Area would not be crossed by Alternative 2. Otherwise similar to the Proposed Action.	Same as Alternative 2	Same as Alternative 2	Route would go through Johnson Canyon rather than the Copper Bottom Area, where the powerline would be a new feature of the landscape and may detract from the experience. Otherwise the same as Alternative 2.	Same as Alternative 2	Same as Alternative 2

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 2	2A	2B	2C	2D	2E
Special Designations, Management Allocations, and Wilderness Resources	Conflict with goals, objectives & resources an area is designated to protect	Same as for Proposed Action	Same as Alternative 2	Same as Alternative 2	Includes segments cb-02 and cb-04, which would have major long-term impacts on lands with wilderness characteristics Polygon 23 (would not meet lands with wilderness characteristics criteria).	Same as Alternative 2	Same as Alternative 2
Noise	Exceedance of regulations or guideline; exposure of receptors to excessive noise levels; generate noise levels that pose a health risk.	Although there would be a difference in number of NSR, impacts would be the same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
Hazards and Hazardous Materials	Generation, use, handling, or disturbance of hazardous waste that: violates Federal, state, or local laws or regulations; poses a health or safety risk to public or environment; releases hazardous emissions; creates a safety hazard to public or private airstrips; or exposes workers, schools, or the public to hazardous materials.	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
Public Health and Safety	Risks to public health, safety, utilities; fire or electrocution hazard; EMF emissions	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
Socioeconomics & Environmental Justice	Employment; Tax collection & revenue; Population or population displacement; Non-market values and ecosystem services; Revenue from recreation sector; Local economy;	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 2	2A	2B	2C	2D	2E
	Reductions in property values; EJ Populations; disproportionate adverse impacts to EJ populations						
Traffic and Transportation	Increased roadway traffic; damage to roadways, access, or road systems; risk to aviation	Structures and lines in the Plomosa or Dome Rock Mountains would pose a minor to moderate long-term aviation hazard to AGFD aircraft; with MM-TT-02 this impact would be reduced to minor and long term.	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2
Visual Resources	Conflicts with visual standards, ordinances, or policies established; major and unmitigated visual changes that degrade or disrupt views of scenic landscapes from highly sensitive viewing locations; VRM class objectives that would not be met requiring an RMP Amendment.	Impacts along the eastern portion (Segments i-01 through i-05) would be the same as Alternative 1. The large lattice H-frame structures would be a major modification and would dominate the views for travelers on SR 95, particularly in conjunction with the existing utility infrastructure. An additional RMP amendment would change the VRM class within the corridor to VRM Class IV.	Subalternative 2A would move the location of the Project south away from I-10, which would reduce the visual impacts.	Subalternative 2B would move the location of the Project south away from I-10, which would reduce the visual impacts.	Subalternative 2C would have no effect on visual resource impacts as viewed within the I-10 corridor.	Subalternative 2D would have no effect on visual resource impacts as viewed within the I-10 corridor.	Subalternative 2E would move the location of the Project north, roughly mid-way between the Proposed Action route and I-10; however, because of the predominate agricultural use and limited sensitive viewers, there would be no discernable change in visual impacts.
Water Resources	Impacts to surface water or groundwater quantity or availability; impediments to floodplain function from channel alterations; impacts to water rights or water quality; violations of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act.	Same as for Proposed Action	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2

Table 4.20-10 Alternative 3 and Subalternative Impacts

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 3	3A	3B	3C	3D	3E	3F	3G	3H	3J	3K	3L	3M
Land ownership (miles)	BLM	82.6	-	-	-	-	-	-	-	-	-	-	-	-
	Reclamation	0.7	-	-	-	-	-	-	-	-	-	-	-	-
	DOD	0.2	-	-	-	-	-	-	-	-	-	-	-	-
	Arizona State Trust	14.0	-	-	-	-	-	-	-	-	-	-	-	-
	Private	25.5	-	-	-	-	-	-	-	-	-	-	-	-
	Indian Lands	-	-		-	-	-	-	-	-	-	-	-	-
	Total Length	123.0	35.4	11.9	25.4	13.9	10.8	9.2	0.6	10.8	2.8	3.3	14.5	11.4
Ground disturbance	Short-term Acres	768.1	183.3	61.1	127.5	75.8	57.4	53.6	4.2	58.2	10.4	77.0	72.4	72.7
	Long-term Acres	466.4	123.3	37.9	85.5	50.5	37.8	50.8	2.2	38.3	17.4	14.9	68.4	27.4
Water Use	Total Gallons	59,018,286.7	34,497,839.5	2,983,337.7	6,308,425.5	3,677,114.6	2,789,535.4	2,371,182.1	164,093.0	2,796,454.8	733,578.7	881,477.8	3,787,667.0	2,998,517.1
BLM RMP conformance	VRM	6 segments required amendments	Same as for Alternative 3	Same as for Alternative 3	Same as for Alternative 3	Same as for Alternative 3	Same as for Alternative 3	Same as for Alternative 3	Same as for Alternative 3	Same as for Alternative 3	Same as for Alternative 3	7 segments required amendments	Same as for Alternative 3	Same as for Alternative 3
	Corridors	Except 5 segments	Except 6 segments	Same as for Alternative 3	Except 4 segments	Same as for Alternative 3	Same as for Alternative 3	Same as for Alternative 3	Same as for Alternative 3	Except 6 segments	Same as for Alternative 3	Same as for Alternative 3	Same as for Alternative 3	Same as for Alternative 3
	RMP Conformance	Amendments required (YFO)	Amendments required (YFO)	Amendments required (YFO)	Amendments required (YFO)	Amendments required (YFO and Lake Havasu)	Amendments required (YFO)	Amendments required (YFO)	Amendments required (YFO)	Amendments required (YFO)	Amendments required (YFO)	Amendments required (YFO)	Amendments required (YFO)	Amendments required (YFO)
	CDCA Plan	Amendment required	Amendment required	Amendment required	Amendment required	Amendment required	Amendment required	Amendment required	Amendment required	Amendment required	Amendment required	Amendment required	Amendment required	Amendment required
Other Plan conformance (Federal, county, municipal)	Plan Conformance	Not consistent with La Paz County Zoning Plan	Not consistent with La Paz County Zoning Plan	Not consistent with La Paz County Zoning Plan	Not consistent with La Paz County Zoning Plan	Not consistent with La Paz County Zoning Plan	Not consistent with La Paz County Zoning Plan and Town of Quartzsite General Plan	Not consistent with La Paz County Zoning Plan	Not consistent with La Paz County Zoning Plan	Not consistent with La Paz County Zoning Plan	Not consistent with La Paz County Zoning Plan	Not consistent with La Paz County Zoning Plan	Not consistent with La Paz County Zoning Plan	Not consistent with La Paz County Zoning Plan
Air Quality and Climate Change	Criteria Air Pollutants – Construction	Same as Proposed Action	Same as Proposed Action											
	CO	38.0	Proportional to Total Length											
	NO_x	103.6	Proportional to Total Length											
	PM_{10}	50.5	Proportional to Total Length											
	$PM_{2.5}$	9.5	Proportional to Total Length											
	SO_2	0.2	Proportional to Total Length											
	VOC	9.1	Proportional to Total Length											
	CO_{2e}	34,331	Proportional to Total Length											
	GHGs – Cons. CO_{2e}	Same as Proposed Action	Same as Proposed Action											

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 3	3A	3B	3C	3D	3E	3F	3G	3H	3J	3K	3L	3M
	Criteria Air Pollutants – O&M	Would not exceed NAAQS or CAAQS	Would not exceed NAAQS or CAAQS											
	GHGs – SF_6 – O&M	Same as Proposed Action	Same as Proposed Action											
Geology, Minerals, and Soil Resources	Geological Hazards Minerals/Mining (access to known resources or claims) Soils	Uses segments ca-07, ca-09, and x -19 which would have negligible to minor impact on sand transport and dunes during construction and operation.	Same as Alternative 33	Same as Alternative 33	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3
Paleontological Resources	Potential damage to known paleontological resources or formations with potential to contain paleontological resources	Same as Proposed Action	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Slightly higher potential for impacts than Alternative Route 3	Same as Alternative 3	Same as Alternative 3	Slightly higher potential for impacts than Alternative 3	Same as Alternative 3
Biological Resources (Vegetation Resources, Wildlife, including Special Status Species and Migratory Birds)	Loss of native habitat/communities; Noxious weeds; Special Status Species & animals); Increased risk of predation or electrocution re infrastructure; Displacement via construction; Displacement via human activity including recreation; Impacts to native habitat and designated management areas; and Migratory birds.	In areas where no linear facilities and few roads exist these impacts would be moderate. Much of this route is in pristine condition, therefore the loss of native habitat/communities is greater than the other alternatives. Moderate long-term impacts due to facilitating spread and increased abundance of non-native plants into new areas, especially into the Dome Rock Mountains and dune habitats. Project would cross 0.6 mile of Harwood's eriastrum	Same as Alternative 3	Same as Alternative 3	Subalternatives 3C and 3D would result in substantially greater impacts than Alternative 3, where habitats have been degraded adjacent to I-10.		Same as Alternative 3	Subalternative 3F would result in a reduction of impacts to vegetation and wildlife resources.	Same as Alternative 3	Subalternative 3H would result in a reduction of impacts to plant and wildlife resources by not utilizing Alternative 3 Segment x-05, which passes close to the Plomosa Mountains through good quality desert scrub habitat where several special status species may be present, and the area has not been impacted by linear	Same as Alternative 3	Subalternative 3K passes through the remote, rugged slopes at Cunningham Peak and Johnson Canyon in the Dome Rock Mountains. The consequence of either option is the same—major adverse impacts to bighorn sheep and other wildlife in this near-pristine area.	Impacts to wildlife, especially to bighorn sheep, would be reduced by moving the Project out of Copper Bottom Pass, which is important to bighorn sheep	Potential impacts to biological resources from Subalternative 3M and Alternative 3 are very similar through the agricultural area just west of the Colorado River. At the river crossing, Subalternative 3M would cross adjacent to an existing utility line, where matching conductor height and structures

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 3	3A	3B	3C	3D	3E	3F	3G	3H	3J	3K	3L	3M
		habitat. Moderate short- and long-term impacts of ground disturbance on protected and special status plants and plant communities. Moderate impact with APMs and BMPs. The collision risk at the Colorado River crossing is higher than under the Proposed Action because the crossing is not adjacent to existing facilities. Major long-term impacts to bighorn sheep in the Dome Rock Mountains by degrading nearly pristine habitat. Major long-term impacts to bighorn sheep in the Dome Rock Mountains by facilitating increased recreational access to remote areas. Minor impact on Sonoran desert tortoise habitat, and negligible impact on Sonoran pronghorn. Passes through Cunningham Peak, a bighorn sheep lambing area. Impacts to wildlife habitats minimized through use of APMs and BMPs. Avoids the Kofa NWR. Minor short- and long-term impacts to								facilities and developments.				could reduce potential collision by birds, affording a benefit to migratory birds.

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 3	3A	3B	3C	3D	3E	3F	3G	3H	3J	3K	3L	3M
		migratory birds due to potential collision hazard with structures, conductors, and guy lines, and additional hazard at the Colorado River.												
Cultural Resources	Damage or loss of a cultural site or potential site under Federal or state registers; degradation of the setting for a cultural site where setting is significant to its listing eligibility; increased access leading to potential vandalism; disturbance of human remains.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 35 (cultural resources survey coverage: 24.4%). Known site density: 9.4 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 134. Key resources projected to occur include trails.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 5.0%). Known site density: 4.7 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 41. Subalternative 3A would result in a greater visual impact and a greater potential to affect cultural resources compared to Alternative 3.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 2 (cultural resources survey coverage: 7.5%). Known site density: 9.7 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 19. Subalternative 3B would result in less ground disturbance and visual impact compared to Alternative 3.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 1 (cultural resources survey coverage: 5.9%). Known site density: 11.0 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 34. Subalternative 3C would result in a comparable visual impact and a lower potential to affect cultural resources by ground disturbance compared to Alternative 3.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 2 (cultural resources survey coverage: 2.0%). Known site density: 30.3 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 102. Subalternative 3D would result in a greater visual impact and a greater potential to affect cultural resources by ground disturbance compared to Alternative 3	Known NRHP-eligible sites or sites requiring NRHP evaluation: 3 (cultural resources survey coverage: 29.0%). Known site density: 9.2 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 21. Subalternative 3E would result in a comparable visual impact but a greater potential to affect cultural resources by ground disturbance compared to Alternative 3.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 3 (cultural resources survey coverage: 23.7%). Known site density: 11.2 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 21. Subalternative 3F would result in a comparable visual impact but less potential to affect cultural resources by ground disturbance compared to Alternative 3.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 1 (cultural resources survey coverage: 89.6%). Known site density: 22.2 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 2. Subalternative 3G demonstrates a low sensitivity for cultural resources in the 200-foot analysis corridor compared to Alternative 3. The potential effect to cultural resources by Subalternative 3G must be further evaluated in	Known NRHP-eligible sites or sites requiring NRHP evaluation: 3 (cultural resources survey coverage: 56.6%). Known site density: 4.7 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 7. The potential effect to cultural resources by Subalternative 3H must be further evaluated in conjunction with the pairing of Subalternative 3H with Subalternatives 3D and 3L compared to Alternative 3.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 36.2%). Known site density: 4.0 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 3. The potential effect to cultural resources by Subalternative 3J must be further evaluated in conjunction with the pairing of Subalternative 3J with Subalternatives 3E, 3F, or 3G and 3H compared to Alternative 3.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 3 (cultural resources survey coverage: 44.8%). Known site density: 4.6 sites per 100 acres[1]. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 2. Subalternative 3K would result in a greater visual impact but less potential to affect cultural resources by ground disturbance compared to Alternative 3.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 3 (cultural resources survey coverage: 45.5%). Known site density: 4.9 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 7. Subalternative 3L would result in a greater visual impact and a greater potential to affect cultural resources by ground disturbance compared to Alternative 3.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 12 (cultural resources survey coverage: 27.0%). Known site density: 15.8sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 65. Subalt 3M would result in a comparable visual impact but a greater potential to affect cultural resources by ground disturbance compared to Alternative 3.

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 3	3A	3B	3C	3D	3E	3F	3G	3H	3J	3K	3L	3M
									conjunction with the pairing of Subalternative 3G with Subalternatives 3D, 3E, 3F, 3H, and/or 3J.					
Issues of Concern to Indian Tribes	Existing and new access, native infrastructure and the interconnection of the cultural and natural environment, places of elevated spiritual important to tribes, the Colorado River, the treatment of human remains, and the disturbance of previously pristine landscapes.	Native infrastructure and the interconnectedness of the cultural and natural environment; the Colorado River; intrusion on pristine landscapes.	Native infrastructure and the interconnectedness of the cultural and natural environment; places of elevated spiritual importance.	No known concerns to Indian tribes.	Native infrastructure and the interconnectedness of the cultural and natural environment; intrusion on pristine landscapes.	No known concerns to Indian tribes.	Native infrastructure and the interconnectedness of the cultural and natural environment.	Native infrastructure and the interconnectedness of the cultural and natural environment.	No known concerns to Indian tribes.	Native infrastructure and the interconnectedness of the cultural and natural environment; places of elevated spiritual importance.	No known concerns to Indian tribes.	Native infrastructure and the interconnectedness of the cultural and natural environment; intrusion on pristine landscapes.	Native infrastructure and the interconnectedness of the cultural and places of elevated spiritual importance.	Native infrastructure and the interconnectedness of the cultural and places of elevated spiritual importance; the Colorado River.
Land Use	Land use authorizations and ROWs; Residential; Agricultural; Other (i.e., nuisance impacts)	Avoids Kofa NWR. Inconsistent with La Paz County Zoning Plan. Would affect more NRCS-classified farmland and solar energy facilities than Proposed Action. One amendment to Yuma RMP for ROW and six for VRM. In California, it would not be in compliance with the CDCA Plan so would require an amendment.	Passes avoidance area for renewable energy development. More ASLD & NRCS-class farmland. Two RMP ROW amendments. Otherwise same as Alternative 3.	More ASLD land. Otherwise same as Alternative 3.	More ASLD land; no ROW amendments to RMP. Otherwise same as Alternative 3.	One additional VRM amendment than Alternative 3.	Passes through La Posa LTVA which may be inconsistent with Quartzsite General Plan. Otherwise same as Alternative 3.	Same as Alternative 3	Same as Alternative 3	Passes Tier III growth area. Two ROW amendments to RMP. Otherwise same as Alternative 3. Otherwise same as Alternative 3.	Same as Alternative 3	Seven segments would require amendments to RMP for VRM. Otherwise same as Alternative 3.	Same as Alternative 3	Same as Alternative 3

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 3	3A	3B	3C	3D	3E	3F	3G	3H	3J	3K	3L	3M
Grazing and Rangeland	Access to range or improvements; Loss of range relative to AUMs; Fragmentation of allotments; Degradation of range quality	Same as the Proposed Action	Removes impediments to 2 tanks under the Proposed Action but impedes access to another tank. Otherwise the same as Alternative 3	Impediments to 3 stock tanks total; negligible impact with MM-GR-1. Otherwise the same as Alternative 3.	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3, except no helicopter fly yards, and no measurable impacts from helicopters.	Same as Alternative 3
Recreation	Physical, access, use, or functional changes to established, designated, or planned recreation areas, resources, experiences, or activities; conflicts with Federal, state, or local policies; affect OHV designations, access, or routes; impacts to hunting access.	Long-term recreation quality similar to Proposed Action except where powerline would be new to the landscape (negligible to minor). Would not cross the La Posa LTVA, Dome Rock Camping Area, Kofa NWR, Copper Bottom Pass, or Johnson Canyon. Otherwise similar to the Proposed Action.	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Would go through La Posa LTVA. Otherwise the same as Alternative 3	Adjacent to La Posa LTVA. Otherwise the same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Route would go through Johnson Canyon – minor impact with mitigation. Otherwise the same as Alternative 3	Route would go through Dome Rock Camping Area. Otherwise the same as Alternative 3	Same as Alternative 3
Special Designations, Management Allocations, and Wilderness Resources	Conflict with goals, objectives & resources an area is designated to protect	Includes segment cb-01 and cb-04 with major long-term effect to lands with wilderness characteristics Polygon 23 (would not meet lands with wilderness characteristics criteria).	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 3	3A	3B	3C	3D	3E	3F	3G	3H	3J	3K	3L	3M
Noise	Exceedance of regulations or guideline; exposure of receptors to excessive noise levels; generate noise levels that pose a health risk.	Although there would be a difference in number of NSR, impacts would be the same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
Hazards and Hazardous Materials	Generation, use, handling, or disturbance of hazardous waste that: violates Federal, state, or local laws or regulations; poses a health or safety risk to public or environment; releases hazardous emissions; creates a safety hazard to public or private airstrips; or exposes workers, schools, or the public to hazardous materials.	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
Public Health and Safety	Risks to public health, safety, utilities; fire or electrocution hazard; EMF emissions	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 3	3A	3B	3C	3D	3E	3F	3G	3H	3J	3K	3L	3M
Socioeconomics & Environmental Justice	Employment; Tax collection & revenue; Population or population displacement; Non-market values and ecosystem services; Revenue from recreation sector; Local economy; Reductions in property values; EJ Populations; disproportionate adverse impacts to EJ populations	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
Traffic and Transportation	Increased roadway traffic; damage to roadways, access, or road systems; risk to aviation	Structures and lines in the Plomosa or Dome Rock Mountains would pose a minor to moderate long-term aviation hazard to AGFD aircraft; with MM-TT-02 this impact would be reduced to minor and long term.	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 3	3A	3B	3C	3D	3E	3F	3G	3H	3J	3K	3L	3M
Visual Resources	Conflicts with visual standards, ordinances, or policies established; major and unmitigated visual changes that degrade or disrupt views of scenic landscapes from highly sensitive viewing locations; VRM class objectives that would not be met requiring an RMP Amendment.	Under Alternative 3, impacts to the I-10 corridor in the eastern portion of the Project Area would be the same as the Proposed Action. Alternative 3 would avoid any impacts to the SR 95 corridor. Impacts to the remainder of this route would the same as Alternative 2.	Subalternative 3A would reduce the effect on visual resources as viewed from I-10.	Subalternative 3B would have the same impact to this portion of the I-10 as described for Alternative 1.	Subalternative 3C would shift the Project nearly 5 miles south of I-10, virtually eliminating visual impacts in that area. Visual impacts would slowly increase as the Project approaches I-10.	Impacts from Subalternative 3D would be the same as those described for Subalternative 1C.	Subalternative 3E would have minor impacts to the views of I-10 travelers who would see the Project paralleling the WAPA 161kV transmission line; however, impacts to nearby residents would be moderate to major	Subalternative 3F would place the Project in closer proximity to I-10, with impacts as described under Alternative 1.	Subalternative 3G would have the same impacts as described for Subalternative 1D.	Subalternative 3H would have impacts to I-10 travelers similar to Alternative 3, the addition of other segments along I-10 west of Quartzsite would increase the visual impacts, as compared to Alternative 3.	Subalternative 3J would use Segment i-05 in conjunction with other segments. See analysis of Subalternative 3F.	Subalternative 3K would have no impacts as viewed within the I-10 corridor.	Subalt 3L would move the Project along I-10 for this segment; see analysis of impacts from this segment under Alternative 1.	Subalt 3M would have no effect on visual resource impacts as viewed within the I-10 corridor.
Water Resources	Impacts to surface water or groundwater quantity or availability; impediments to floodplain function from channel alterations; impacts to water rights or water quality; violations of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act.	Same as Proposed Action	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3	Same as Alternative 3

Table 4.20-11 Alternative 4 and Subalternative 4A through 4H Impacts

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 4	4A		4B	4C	4D	4E	4F	4G	4H
Land ownership (miles)	BLM	84.6	-		-	-	-	-	-	-	-
	Reclamation	0.8	-		-	-	-	-	-	-	-
	DOD	0.2									
	State	6.0	-		-	-	-	-	-	-	-
	Private	28.7	-		-	-	-	-	-	-	-
	Total Length	120.3	29.7		25.6	10.5	12.5	3.2	4.4	6.6	7.7
Ground disturbance	Short-term Acres	760.4	165.8		126.1	52.6	68.3	69.0	24.5	51.6	41.2
	Long-term Acres	468.1	78.5		85.5	49.7	56.9	17.2	25.1	52.2	27.0
Water Use	Total Gallons	56,657,105.1	34,789,685.5		6,566,116.1	2,766,815.2	3,168,902.8	860,690.6	1,134,144.8	1,728,298.8	1,975,288.4
BLM RMP conformance	VRM	7 Segments require amendments	8 Segments require amendments		Same as Alternative 4	Same as Alternative 4	8 Segments require amendments	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4
	Corridors	Except 5 segments	Same as Alternative 4		Except 6 segments	Same as Alternative 4	Except 6 segments	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4
	RMP Conformance	Amendments required (YFO and Lake Havasu)	Amendments required (YFO)		Amendments required (YFO)	Amendments required (YFO)	Amendments required (YFO)	Amendments required (YFO)	Amendments required (YFO)	Amendments required (YFO)	Amendments required (YFO)
	CDCA Plan	Amendment required	Amendment required		Amendment required	Amendment required	Amendment required	Amendment required	Amendment required	Amendment required	Amendment required
Other Plan conformance (Federal, county, municipal)	Plan Conformance	Not consistent with La Paz County Zoning Plan	Not consistent with La Paz County Zoning Plan		Not consistent with La Paz County Zoning Plan	Not consistent with La Paz County Zoning Plan	Not consistent with La Paz County Zoning Plan	Not consistent with La Paz County Zoning Plan	Not consistent with La Paz County Zoning Plan	Not consistent with La Paz County Zoning Plan	Not consistent with La Paz County Zoning Plan
Air Quality and Climate Change	Criteria Air Pollutants – Construction	Same as Proposed Action		Same as Proposed Action							
	CO	38.7 tpy		Proportional to Total Length							
	NO_x	105.4 tpy		Proportional to Total Length							
	PM_{10}	51.4 tpy		Proportional to Total Length							
	$PM_{2.5}$	9.7 tpy		Proportional to Total Length							
	SO_2	0.2 tpy		Proportional to Total Length							
	VOC	9.3 tpy		Proportional to Total Length							
	CO_{2e}	34,943 tpy		Proportional to Total Length							
	GHGs – Cons. CO_{2e}	Same as Proposed Action		Same as Proposed Action							
	Criteria Air Pollutants – O&M	Would not exceed NAAQS or CAAQS		Would not exceed NAAQS or CAAQS							
	GHGs – SF_6 – O&M	Same as Proposed Action		Same as Proposed Action							

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 4	4A		4B	4C	4D	4E	4F	4G	4H
Geology, Minerals, and Soil Resources	Geological Hazards Minerals/ Mining (access to known resources or claims) Soils	Uses segments ca-07, ca-09, and x-19 which would have negligible to minor impact on sand transport and dunes during construction and operation	Same as Alternative 4		Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4
Paleontological Resources	Potential damage to known paleontological resources or formations with potential to contain paleontological resources	Same as Proposed Action but less than Alternative 2	Same as Alternative 4		Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4
Biological Resources (Vegetation Resources. Wildlife, including Special Status Species and Migratory Birds)	Loss of native habitat/communities; Noxious weeds; Special Status Species & animals); Increased risk of predation or electrocution re infrastructure; Displacement via construction; Displacement via human activity including recreation; Impacts to native habitat and designated management areas; and Migratory birds.	In areas where no linear facilities and few roads exist these impacts would be moderate. Moderate long-term impacts due to facilitating spread and increased abundance of non-native plants into new areas, especially into the Dome Rock Mountains and dune habitats. Project would cross 0.6 mile of Harwood's eriastrum habitat. Moderate short- and long-term impacts of ground disturbance on protected and special status plants and plant communities. Moderate impact with APMs and BMPs. Predation potential and electrocution risk	Slight increase of impacts to wildlife compared to Alternative 4 due in part to coming close to a wildlife water that may be used by desert bighorn sheep and mule deer.		Minor reduction of impacts from Alternative 4, crossing less desert habitat in moderate to good condition.	Parallels I-10 and would not contribute to any substantial new impacts	Greater impacts than for Alternative 4 as special status species may occur in desert scrub habitat within the corridor, mostly in the Plomosa Mountains.	As with Alternative 4, major adverse impacts to bighorn sheep and other wildlife in near-pristine area.	Slightly less impact to biological resources than Alternative 4 because it impacts approximately one mile less.	Impacts substantially less than for Alternative 4 by staying in an existing corridor through Copper Bottom Pass	Fewer impacts than Alternative 4

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 4	4A		4B	4C	4D	4E	4F	4G	4H
		same as Proposed Action. Major long-term impacts to bighorn sheep in the Dome Rock Mountains by degrading nearly pristine habitat. Route would be close to a wildlife water in Johnson Canyon. Major long-term impacts to bighorn sheep in the Dome Rock Mountains by degrading nearly pristine habitat and facilitating increased recreational access to remote areas. Minor impact on Sonoran desert tortoise and Sonoran pronghorn habitat. Passes through Cunningham Peak, a bighorn sheep lambing area. Impacts to wildlife habitats minimized through use of APMs and BMPs. Avoids the Kofa NWR. Migratory birds similar to Proposed Action.									

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 4	4A		4B	4C	4D	4E	4F	4G	4H
Cultural Resources	Damage or loss of a cultural site or potential site under Federal or state registers; degradation of the setting for a cultural site where setting is significant to its listing eligibility; increased access leading to potential vandalism; disturbance of human remains.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 41 (cultural resources survey coverage: 23.2%). Known site density: 10.3 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 170. Key resources projected to occur include trails. Areas of tribal concern (NRHP-listed Ripley Intaglio Site, NRHP-listed Eagletail Petroglyph Site, and Limekiln Wash Intaglio Site) are in the vicinity of this alternative route. Continued consultation with Indian tribes and/or other interested parties potentially may identify additional resources of concern.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 11 (cultural resources survey coverage: 43.2%). Known site density: 4.3 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 33. Subalternative 4A would result in a greater visual impact and a greater potential to impact cultural resources by ground disturbance compared to Alternative 4.		Known NRHP-eligible sites or sites requiring NRHP evaluation: 1 (cultural resources survey coverage: 3.6%). Known site density: 17.5 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 111. Subalternative 4B would result in a greater visual impact and a greater potential to affect cultural resources by ground disturbance compared to Alternative 4.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 2.0%). Known site density: 18.5 sites per 100 acres[1]. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 0. The potential effect to cultural resources by Subalternative 4C must be further evaluated in conjunction with the pairing of Subalternative 4C with Subalternatives 4D or 4J.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 6 (cultural resources survey coverage: 5.7%). Known site density: 38.7 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 122. Subalternative 4D would result in a comparable visual impact and a lower potential to affect cultural resources by ground disturbance compared to Alternative 4.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 4.8%). Known site density: 0.0 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 0. Subalternative 4E would result in the same visual impact as Alternative 4.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 8.7%). Known site density: 0.0 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 0. Subalternative 4F would result in the same visual impact but a lower potential to impact cultural resources by ground disturbance compared to Alternative 4.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 1 (cultural resources survey coverage: 43.7%). Known site density: 2.8 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 2. Subalternative 4G would result in a comparable visual impact but a lower potential to affect cultural resources by ground disturbance compared to Alternative 4.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 1 (cultural resources survey coverage: 31.6%). Known site density: 8.4 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 12. The potential effect to cultural resources by Subalternative 4H must be further evaluated in conjunction with the pairing of Subalternative 4H with Subalternatives 4G and 4K.

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 4	4A		4B	4C	4D	4E	4F	4G	4H
Issues of Concern to Indian Tribes	Existing and new access, native infrastructure and the interconnection of the cultural and natural environment, places of elevated spiritual important to tribes, the Colorado River, the treatment of human remains, and the disturbance of previously pristine landscapes.	Native infrastructure and the interconnectedness of the landscape; places of elevated spiritual importance; the Colorado River; intrusion on pristine landscapes.	No known concerns to Indian tribes.		Native infrastructure and the interconnectedness of the landscape.	No known concerns to Indian tribes.	Native infrastructure and the interconnectedness of the landscape; intrusion on pristine landscapes.	Native infrastructure and the interconnectedness of the landscape; intrusion on pristine landscapes.	Native infrastructure and the interconnectedness of the landscape; places of elevated spiritual importance; intrusion on pristine landscapes.	Native infrastructure and the interconnectedness of the landscape.	Native infrastructure and the interconnectedness of the landscape.
Land Use	Land use authorizations and ROWs; Residential; Agricultural; Other (i.e., nuisance impacts)	Would not cross Kofa NWR. Inconsistent with La Paz County Zoning Plan. Affects more NRCS-class farmland & solar facilities than Proposed Action. Five RMP amends for ROW and VRM for seven segments. In California, it would not be in compliance with the CDCA Plan so would require an amendment.	Amendments for 8 segments for VRM. Otherwise the same as Alternative 4		Crosses more ASLD land. Six ROW amendments to RMP. Otherwise the same as Alternative 4	Same as Alternative 4	Six RMP amendments for ROW and eight for VRM. Otherwise the same as for Alternative 4.	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 4	4A		4B	4C	4D	4E	4F	4G	4H
Grazing and Rangeland	Access to range or improvements; Loss of range relative to AUMs; Fragmentation of allotments; Degradation of range quality	Access impediment to one stock tank; impact reduced to negligible with MM-GR-1.	Access to one additional stock tank vs Alternative 4; impact reduced to negligible with MM-GR-1.		Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4
Recreation	Physical, access, use, or functional changes to established, designated, or planned recreation areas, resources, experiences, or activities; conflicts with Federal, state, or local policies; affect OHV designations, access, or routes; impacts to hunting access.	Long-term recreation quality similar to Proposed Action except where powerline would be new to the landscape (negligible to minor). Would run adjacent to the La Posa LTVA, but would avoid Dome Rock Camping Area and Kofa NWR. Would run through Johnson Canyon. Otherwise similar to the Proposed Action.	Same as Alternative 4		Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4 except that the route would cross Cunningham Peak, thus avoiding Johnson Canyon.	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4
Special Designations, Management Allocations, and Wilderness Resources	Conflict with goals, objectives & resources an area is designated to protect	Includes segments cb-2 and cb-04 with major long-term impacts to lands with wilderness characteristics Polygon 23 (would not meet lands with wilderness characteristics criteria).	Same as Alternative 4		Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Would not include segments cb-02 and cb-04, and therefore would not have the impact to lands with wilderness characteristics Polygon 23	Same as Alternative 4

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 4	4A		4B	4C	4D	4E	4F	4G	4H
Noise	Exceedance of regulations or guideline; exposure of receptors to excessive noise levels; generate noise levels that pose a health risk.	Although there would be a difference in number of NSR, impacts would be the same as Proposed Action	Same as Proposed Action		Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
Hazards and Hazardous Materials	Generation, use, handling, or disturbance of hazardous waste that: violates Federal, state, or local laws or regulations; poses a health or safety risk to public or environment; releases hazardous emissions; creates a safety hazard to public or private airstrips; or exposes workers, schools, or the public to hazardous materials.	Same as Proposed Action	Same as Proposed Action		Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
Public Health and Safety	Risks to public health, safety, utilities; fire or electrocution hazard; EMF emissions	Same as Proposed Action	Same as Proposed Action		Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 4	4A		4B	4C	4D	4E	4F	4G	4H
Socioeconomics & Environmental Justice	Employment; Tax collection & revenue; Population or population displacement; Non-market values and ecosystem services; Revenue from recreation sector; Local economy; Reductions in property values; EJ Populations; disproportionate adverse impacts to EJ populations	Same as Proposed Action	Same as Proposed Action		Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
Traffic and Transportation	Increased roadway traffic; damage to roadways, access, or road systems; risk to aviation	Structures and lines in the Plomosa or Dome Rock Mountains would pose a minor to moderate long-term aviation hazard to AGFD aircraft; with MM-TT-02 this impact would be reduced to minor and long term.	Same as Alternative 4		Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4

CHARACTERISTIC OR RESOURCE IMPACT		ALTERNATIVE 4	4A		4B	4C	4D	4E	4F	4G	4H
Visual Resources	Conflicts with visual standards, ordinances, or policies established; major and unmitigated visual changes that degrade or disrupt views of scenic landscapes from highly sensitive viewing locations; VRM class objectives that would not be met requiring an RMP Amendment.	Alternative 4 would remain south of and not impact the visual resources along the I-10 until Segment i-04; impacts were previously described as follows: Segment in-01 – Subalternative 1C Segments ca-06, ca-07, ca-09, x-19 – Alternative 3. All other segments would not impact views along I-10.	Subalternative 4A would have no effect on visual resource impacts as viewed within the I-10 corridor.		Subalternative 4B would place the Project in closer proximity to I-10 with impacts as described for Alternative 2.	Subalternative 4C would have the same impacts as described for Subalternative 3C.	Subalternative 4D would have the same impacts as described for Subalternative 3F and the Proposed Action.	Subalternative 4E would have no effect on the I-10 corridor.	Subalternative 4F would have no effect on the I-10 corridor.	Subalternative 4G would have no effect on the I-10 corridor.	Subalternative 4H would place the Project along I-10 in a narrow canyon area west of the Dome Rock Mountains that opens up to broad, panoramic views. It would impact visual resources similar to impacts in the eastern portion of the Project Area.
Water Resources	Impacts to surface water or groundwater quantity or availability; impediments to floodplain function from channel alterations; impacts to water rights or water quality; violations of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act.	Same as Proposed Action	Same as Alternative 4		Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4

[1]Site density calculations include sites that have been previously determined or recommended as ineligible for the NRHP. In cases where the projected counts of NRHP-eligible or site of unknown NRHP eligibility are 0 and the site density is greater than 0, the site density calculation includes NRHP ineligible sites.

Table 4.20-12 Alternative 4 Subalternative 4J through 4P Impacts

CHARACTERISTIC OR RESOURCE IMPACT		4J	4K	4L	4M	4N	4P
Land ownership (miles)	BLM	-	-	-	-	-	-
	Reclamation	-	-	-	-	-	-
	Arizona State Trust	-	-	-	-	-	-
	Private	-	-	-	-	-	-
	Total Length	2.8	2.4	4.0	6.7	1.2	10.1
Ground disturbance	Short-term Acres	10.4	17.8	26.6	45.1	6.2	80.4
	Long-term Acres	17.4	9.2	14.5	23.6	4.5	28.4
Water Use	Total Gallons	733,578.7	679,299.9	1,064,951.7	1,754,784.7	343,656.5	2,671,593.0
BLM RMP conformance	VRM	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4
	Corridors	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4
	RMP Conformance	Amendments required (YFO)	Amendments required (YFO)	Amendments required (YFO)	Amendments required (YFO)	Amendments required (YFO)	Amendments required (YFO)
	CDCA Plan	Amendment required	Amendment required	Amendment required	Amendment required	Amendment required	Amendment required
Other Plan conformance (Federal, county, municipal)	Plan Conformance	Not consistent with La Paz County Zoning Plan	Not consistent with La Paz County Zoning Plan	Not consistent with La Paz County Zoning Plan	Not consistent with La Paz County Zoning Plan	Not consistent with La Paz County Zoning Plan	Not consistent with La Paz County Zoning Plan
Air Quality and Climate Change	Criteria Air Pollutants – Construction	Same as Proposed Action					
	CO	Proportional to Total Length					
	NO_x	Proportional to Total Length					
	PM_{10}	Proportional to Total Length					
	$PM_{2.5}$	Proportional to Total Length					
	SO_2	Proportional to Total Length					
	VOC	Proportional to Total Length					
	CO_{2e}	Proportional to Total Length					
	GHGs – Construction CO_{2e}	Same as Proposed Action					
	Criteria Air Pollutants – O&M	Would not exceed NAAQS or CAAQS					
	GHGs – SF_6 – O&M	Same as Proposed Action					
Geology, Minerals, and Soil Resources	Geological Hazards Minerals/Mining (access to known resources or claims) Soils	Uses segments Ca-07, Ca-09, and X-19 which would have negligible to minor impact on sand transport and dunes during construction and operation	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Proposed Action
Paleontological Resources	Potential damage to known paleontological resources or formations with potential to contain paleontological resources	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Slightly higher potential than Alternative 4

CHARACTERISTIC OR RESOURCE IMPACT		4J	4K	4L	4M	4N	4P
Biological Resources (Vegetation Resources, Wildlife, including Special Status Species and Migratory Birds)	Loss of native habitat/communities; Noxious weeds; Special Status Species & animals); Increased risk of predation or electrocution re infrastructure; Displacement via construction; Displacement via human activity including recreation; Impacts to native habitat and designated management areas; and Migratory birds.	These subalternatives largely follow I-10, or cross agricultural areas, and would have fewer impacts than Alternative 4. Subalternatives 4K and 4L cross the Colorado River in areas not adjacent to the existing DPV1 line and may have result in a greater collision hazard to birds.					Potential impacts to biological resources are substantially less for Subalternative 4P than Alternative 4 by avoiding major dune habitat.
Cultural Resources	Damage or loss of a cultural site or potential site under Federal or state registers; degradation of the setting for a cultural site where setting is significant to its listing eligibility; increased access leading to potential vandalism; disturbance of human remains.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 36.3%). Known site density: 4.0 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 3. The potential effect to cultural resources by Subalternative 4J must be further evaluated in conjunction with the pairing of Subalternative 4J with Subalternative 4H.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 28.2%). Known site density: 0.0 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 0. The potential effect to cultural resources by Subalternative 4K must be further evaluated in conjunction with the pairing of Subalternative 4K with Subalternative 4H and 4N.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 1 (cultural resources survey coverage: 7.5%). Known site density: 13.5 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 13. The potential effect to cultural resources by Subalternative 4L must be further evaluated in conjunction with the pairing of Subalternative 4L with Subalternative 4M.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 2.0%). Known site density: 272.7 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 442. Subalternative 4M would result in a comparable visual impact and a comparable potential to disturb cultural resources compared to Alternative 4.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 0 (cultural resources survey coverage: 60.8%). Known site density:0.0 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 0. The potential effect to cultural resources by Subalternative 4N must be further evaluated in conjunction with the pairing of Subalternative 4N with Subalternatives 4H, 4K, and 4M.	Known NRHP-eligible sites or sites requiring NRHP evaluation: 3 (cultural resources survey coverage: 60.4%). Known site density: 31.1 sites per 100 acres. Projected NRHP-eligible sites or sites requiring NRHP evaluation: 36. Subalternative 4P would result in a higher visual impact, but a lower potential to affect cultural resources by ground disturbance compared to Alternative 4.
Issues of Concern to Indian Tribes	Existing and new access, native infrastructure and the interconnection of the cultural and natural environment, places of elevated spiritual important to tribes, the Colorado River, the treatment of human remains, and the disturbance of previously pristine landscapes.	No known concerns to Indian tribes.	Places of elevated spiritual important to tribes, the Colorado River.	Native infrastructure and the interconnection of the cultural and natural environment; the Colorado River.	No known concerns to Indian tribes.	No known concerns to Indian tribes.	Native infrastructure and the interconnection of the cultural and natural environment; places of elevated spiritual importance.
Land Use	Land use authorizations and ROWs; Residential; Agricultural; Other (i.e., nuisance impacts)	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Would cross more NRCS-classified farmland than Alternative 4. Otherwise the same as for Alternative 4.	Same as Alternative 4	Same as Alternative 4
Grazing and Rangeland	Access to range or improvements; Loss of range relative to AUMs; Fragmentation of allotments; Degradation of range quality	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4

CHARACTERISTIC OR RESOURCE IMPACT		4J	4K	4L	4M	4N	4P
Recreation	Physical, access, use, or functional changes to established, designated, or planned recreation areas, resources, experiences, or activities; conflicts with Federal, state, or local policies; affect OHV designations, access, or routes; impacts to hunting access.	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4
Special Designations, Management Allocations, and Wilderness Resources	Conflict with goals, objectives & resources an area is designated to protect	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4
Noise	Exceedance of regulations or guideline; exposure of receptors to excessive noise levels; generate noise levels that pose a health risk.	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
Hazards and Hazardous Materials	Generation, use, handling, or disturbance of hazardous waste that: violates Federal, state, or local laws or regulations; poses a health or safety risk to public or environment; releases hazardous emissions; creates a safety hazard to public or private airstrips; or exposes workers, schools, or the public to hazardous materials.	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
Public Health and Safety	Risks to public health, safety, utilities; fire or electrocution hazard; EMF emissions.	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
Socioeconomics & Environmental Justice	Employment; Tax collection & revenue; Population or population displacement; Non-market values and ecosystem services; Revenue from recreation sector; Local economy; Reductions in property values; EJ Populations; disproportionate adverse impacts to EJ populations	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
Traffic and Transportation	Increased roadway traffic; damage to roadways, access, or road systems; risk to aviation	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4

CHARACTERISTIC OR RESOURCE IMPACT		4J	4K	4L	4M	4N	4P
Visual Resources	Conflicts with visual standards, ordinances, or policies established; major and unmitigated visual changes that degrade or disrupt views of scenic landscapes from highly sensitive viewing locations; VRM class objectives that would not be met requiring an RMP Amendment.	Subalternative 4J would have the same visual impacts to along I-10 as described for Subalternative 3J.	Subalternative 4K would have no effect on visual resource impacts as viewed within the I-10 corridor.	Subalternative 4L would have no effect on visual resource impacts as viewed within the I-10 corridor.	Subalternative 4M would have no effect on visual resource impacts as viewed within the I-10 corridor.	Subalternative 4N would have no effect on visual resource impacts as viewed within the I-10 corridor.	Subalternative 4P would have no effect on visual resource impacts as viewed within the I-10 corridor.
Water Resources	Impacts to surface water or groundwater quantity or availability; impediments to floodplain function from channel alterations; impacts to water rights or water quality; violations of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act.	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4	Same as Alternative 4

4.20.5 Monitoring and Mitigation Summary

In addition to the Project design features, the APMs proposed by DCRT, and BMPs provided by BLM (Appendix 2A), which are already included as part of the Proposed Action and any Action Alternative, additional monitoring and MMs are necessary. These additional measures are in response to identified potential environmental impacts. These measures are taken verbatim from the applicable resource sections and combined all together in this section as they would be included and apply to the selected route. Additionally, WAPA would require preparation of a Mitigation Action Plan (to be completed before NTP would be issued), if impacts were not addressed through implementation of BMPs, APMs, and MMs.

The applicability of CMAs to the Project was determined using a CMA checklist (Appendix 2C). Those CMAs that are addressed by mitigation measures are provided in parenthesis following the measures.

No mitigation would be required by the BLM for: air quality and GHGs; geology, minerals, or soil resources; paleontological resources; land use; special designations, management allocations, and wilderness resources; noise; public health and safety; socioeconomics; environmental justice; and water resources.

4.20.5.1 Biological Resources

MM-BIO-01: A Compensation Plan would be developed to meet BLM requirements and approval. The Compensation Plan would include calculations of compensation ratios and mitigation acreages for loss of habitat for special status and protected native plant species, special status plant communities, Mojave desert tortoise, Sonoran desert tortoise, and any other biological resource requiring additional mitigation. Compensatory mitigation could include payment of an in-lieu fee; acquiring mitigation land or conservation easements; restoration or habitat enhancement activities on public lands; or a combination of the three (LUPA-BIO-COMP-1, LUPA-BIO-COMP-2, DFA-VPL-BIO-COMP-1, and LUPA-COMP-1; Appendix 2C).

4.20.5.2 Cultural Resources and Concerns of Indian Tribes

Mitigation measures for cultural resources are outlined in the revised draft PA for the Project (Appendix 2D). The final PA would be developed and executed prior to the issuance of the ROD, and measures contained in the PA would be implemented prior to and during construction and post-construction during operations and maintenance activities. Decommissioning would be a separate undertaking and would require separate Section 106 compliance, as stipulated in the PA.

4.20.5.3 Grazing

MM-GR-01: If construction would preclude or hinder livestock access to these stockponds or other livestock water sources, DCRT would provide a suitable alternate livestock water source during construction.

4.20.5.4 Recreation

MM-REC-01: To mitigate effects related to the temporary construction closure of the proposed Arizona Peace Trail and other OHV routes through Johnson Canyon, MM-REC-01 would require that construction of the Project occur outside of peak OHV season. Construction in Johnson Canyon would occur between the months of July and September.

MM-REC-02: In areas of high OHV use, such as in Copper Bottom Zone and the Ehrenberg Sandbowl OHV Area, proposed Project structures with guy wires would be replaced with self-supporting (no guy wires) lattice structures or monopoles. Additionally, in all other areas where guyed V structures are used, the anchor positions would be placed no less than 50 feet from any trail or road, and the guy wire would be at least 15 feet above (at its lowest point) any road or trail crossed by a guy wire. This would reduce the safety risk to OHV users.

MM-REC-03: New access roads will be gated where appropriate, and signage including road status will be posted at all new access road junctions.

MM-REC-04: Utilizing self-supported four-legged tangent structures, where required for mitigation, would increase the permanent disturbance to soils, wildlife habitat, and other land-dependent resources to 0.06-acre per structure, and from <0.01 to 0.01 acre per structure for other structure types. The effects of structures on these resources are analyzed in the individual resource sections.

4.20.5.5 Hazardous Materials and Hazardous and Solid Waste

MM-HAZ-01: Resource studies establishing baseline conditions for the Project included a screening-level assessment of hazardous materials sites within a 1-mile wide study area encompassing the Proposed and Alternative segments. The screening consisted of searching over 50 government and private databases, including lists specified in California's Government Code Section 65962.5. These databases included the EPA Hazardous Materials Incident Report System, the California "Cortese" Hazardous Waste and Substances Sites List, and the federal database listings of UXO Sites, Formerly Used Defense Sites (FUDS), and Department of Defense sites. No mapped Superfund sites or sites on the National Priorities List were documented; however, multiple industrial, commercial, mining, and other potentially contaminated sites are located within the hazardous materials study area, including the FUDS Laguna Maneuver Area.

Results of this screening would be used to guide the continued development of Project design, including structure placement locations within a corridor along the selected route, and where other Project-related ground disturbing activities occur outside of the corridor which could include lay-down areas, pulling stations, and access sites. DCRT would implement the mitigation sequence described in Section 4.13.6 to avoid or minimize the potential for hazardous materials-related impacts to construction workers, the public, and the environment.

4.20.5.6 Traffic and Transportation

There would not be any mitigation measures necessary related to construction activities. Mitigation related to operations would include:

MM-TT-01: Structures within Segment ca-05 would constitute a moderate to major, long-term effect associated with a collision hazard at the Cyr Aviation Airport. The voluntary marking of structures and lines within 0.5 mile of such facilities with spherical markers and lighting would reduce this effect to minor to moderate.

MM-TT-02: Structures and lines within Segments in-01 and i-04 where they pass through the Plomosa Mountains and Segments i-06, cb-01, cb-02, cb-03, and cb-04 in the Dome Rock Mountains would constitute a moderate to major, long-term effect on the safety of AGFD aircraft conducting aerial wildlife surveys. The marking of structures and lines in these locations would reduce this effect to minor.

4.20.5.7 Visual Resources

The following measures would be applied in locations identified in the impact analysis portion of this study.

MM-VIS-01: Minimize disturbance at structure bases.

MM-VIS-02: No access routes would be constructed to structure sites, and thus structure sites be accessed by foot or helicopter.

MM-VIS-03: Apply surface treatments (such as Permeon, or an approved equal) to newly exposed rock and gravel to blend with surrounding rock face and minimize visual impact of attention-attracting disturbance.

MM-VIS-04: Limit height of structures to that absolutely necessary for safety and operation in order to minimize skylining and reduce the need for beacons to protect dark sky resources and maintain astronomical viewing opportunities.

MM-VIS-05: Shorten span lengths and design the route to follow canyon routes to minimize elements (conductors in particular) that would be overhead of viewers and skylined.

MM-VIS-06: Use structure type to match existing structures and reduce form contrast.

Technical Environmental Study Chapter 5

Ten West Link 500kV Transmission Line Project

Prepared for:

US Department of the Interior

Bureau of Land Management

Yuma Field Office

Prepared By:

Stantec Consulting Services Inc.

2890 East Cottonwood Parkway, Suite 300

Salt Lake City, Utah 84121

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Table of Contents

5.0 REFERENCES, ACRONYMS, ABBREVIATIONS, AND GLOSSARY

5.1 REFERENCES

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5.2 ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
AAC	Arizona Administrative Code
AADT	annual average daily traffic
AB	Assembly Bill
AC	alternating current
ACC	Arizona Corporation Commission
ACEC	Area of Critical Environmental Concern
ACGIH	American Conference of Governmental Industrial Hygienists
ACHP	Advisory Council on Historic Preservation
ACS	American Community Survey
ACSR	aluminum conductor steel-reinforced
AD	*anno Domini*, or in the year of our Lord
ADA	Arizona Department of Agriculture
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
ADWR	Arizona Department of Water Resources
AGFD	Arizona Game and Fish Department
AIRFA	American Indian Religious Freedom Act
Alt.	Alternative
AMA	active management area
ANPL	Arizona Native Plant Law
ANSI	American National Standards Institute
APE	Area of Potential Effect
APLIC	Avian Power Line Interaction Committee
APM	applicant proposed measure
APP/BBCS	Avian Protection Plan and Bird and Bat Conservation Strategy
APS	Arizona Public Service
AQRVs	Air Quality Related Values
ARHP	Arizona Register of Historic Places
ARPA	Archaeological Resources Protection Act
ARS	Arizona Revised Statutes

Acronym/Abbreviation	Definition
asl	above sea level
ASLD	Arizona State Land Department
ASM	Arizona State Museum
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
ATCM	airborne toxic control measure
ATV	all-terrain vehicle
AT&SF	Atchison, Topeka, and Santa Fe Railroad
AUM	animal unit month
AZ	Arizona
AZ-CRD	Colorado River District Fire Zone
AZGS	Arizona Geological Survey
AZMNH	Arizona Museum of Natural History
AZ-PHD	Phoenix District Fire Zone
AZSITE	Arizona Archaeological Site and Survey Database
BA	Biological Assessment
BBCS	Bird and Bat Conservation Strategy
BC	before Christ
BEA	Bureau of Economic Analysis
BGEPA	Bald and Golden Eagle Protection Act
bgs	below ground surface
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	best management practice
BO	biological opinion
CA	California
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAFE	Corona and Field Effects Program
CAISO	California Independent System Operator
CalEEMod	California Emissions Estimator Model

Acronym/Abbreviation	Definition
CalEPA	California Environmental Protection Agency
CAL FIRE	California Department of Forestry and Fire Protection
Caltrans	California Department of Transportation
CAP	Central Arizona Project
CARB	California Air Resources Board
CASTNet	Clean Air Status and Trends Networks
CB	Copper Bottom
CCD	Census county division
CEC	California Energy Commission
CCR	California Code of Regulations
CDCA	California Desert Conservation Area
CDFW	California Department of Fish and Wildlife
CDP	Census designated place
CEA	Cumulative Effects Area
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFGC	California Fish and Game Commission
CFR	Code of Federal Regulations
CGS	California Government Code
CH_4	methane
CHRIS	California Historical Resource Information System
CIC	Compliance Inspection Contractor
CMA	Conservation and Management Actions
CNDDB	California Natural Diversity Database
CNPA	California Native Plant Protection Act
CO	carbon monoxide
CO_2	carbon dioxide
CO_{2e}	carbon dioxide equivalent
CPUC	California Public Utilities Commission
CRHR	California Register of Historic Resources

Acronym/Abbreviation	Definition
CRIT	Colorado River Indian Tribes
CRPR	California Rare Plant Ranking
CSLC	California State Lands Commission
CWA	Clean Water Act
CY	cubic yard
dB	decibel
dBA	A-weighted decibel
DCRT	DCR Transmission, LLC
DEIS	draft EIS
DFA	Development Focus Area
DMMR	Department of Mines and Mineral Resources
DOC	California Department of Conservation
DOD	Department of Defense
DOE	Department of Energy
DOI	Department of the Interior
DPV1	Devers to Palo Verde 500kV No. 1
DPV2	Devers to Palo Verde 500kV No.2
DRECP	Desert Renewable Energy Conservation Plan
DTC-CAMA	Desert Training Center, California-Arizona Maneuver Area
DTSC	Department of Toxic Substance Control
dv	deciview
E	Endangered
EA	Environmental Assessment
EDR	Environmental Data Resources, Inc.
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EJ	Environmental Justice
ELF	extremely low frequency
EMF	electric and magnetic field
EO	Executive Order
EPA	Environmental Protection Agency

Acronym/Abbreviation	Definition
EPMs	Environmental Protection Measures
ERMA	Extensive Recreation Management Area
ESA	Endangered Species Act
eWRIMS	Water Rights Information Management System
f	frequency
°F	degrees Fahrenheit
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FHA	Federal Highway Administration
FLPMA	Federal Land Policy and Management Act
FO	Field Office
ft	feet
gal	gallon
GHG	greenhouse gas
GIS	Geographic Information System
GLO	General Land Office
GMU	game management unit
GPL	General Public Lands
GPS	Global Positioning System
GWP	global warming potential
HAP	hazardous air pollutant
HFC	hydrofluorocarbons
HMA	herd management area
HMMP	Hazardous Materials Management Plan
HPTP	Historic Properties Treatment Plan
HR	Harvest Restricted
HS	Highly Safeguarded
H_2S	hydrogen sulfide
HUC	hydrologic unit code

Acronym/Abbreviation	Definition
HWCL	Hazardous Waste Control Law
Hz	hertz
I	Interstate
IBC	International Building Code
ICAPCD	Imperial County Air Pollution Control District
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IEEE	Institute of Electrical and Electronics Engineers
IFR	instrument flight rules
IM	Instruction Memorandum
IMPROVE	Interagency Monitoring of Protected Visual Environments
INA	irrigation non-expansion area
IPCC	Intergovernmental Panel on Climate Change
km	kilometer
KOP	key observation point
kV	kilovolt
LCRMSCP	Lower Colorado River Multi-Species Conservation Program
Ldn	day-night sound level
Leq	equivalent sound level
Lmax	maximum Leq
Lmin	minimum Leq
LOS	level of service
LR2000	Legacy Rehost 2000 System
LT	long term
LTVA	long term visitor area
LUPA	Land Use Plan Amendment
LUST	leaking underground storage tank
m	meter
Ma	million years ago
MAG	Maricopa Association of Governments
MBTA	Migratory Bird Treaty Act
MDAQMD	Mojave Desert Air Quality Management District

Acronym/Abbreviation	Definition
mG	milligauss
Mo	month
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
mph	miles per hour
MSDS/SDS	Material Safety Data Sheet/Safety Data Sheet
MSL	mean sea level
$MTCO_2e$	metric tons CO_2e
Mtns	Mountains
MTR	military training routes
MVAr	megavolt-ampere reactive
MVCD	Minimum Vegetation Clearance Distance
MW	megawatt
N_2O	nitrous oxide
N/A	Not Applicable
n.d.	No Date
NAAQS	National Ambient Air Quality Standards
NADP	National Atmospheric Deposition Program
NAGPRA	Native American Graves Protection and Repatriation Act
NCL	National Conservation Area
NECO	Northern and Eastern Colorado Desert Coordinated Management Plan
NEI	National Emissions Inventory
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NESC	National Electrical Safety Code
NFPA	National Fire Protection Association
NHD	National Hydrography Dataset
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NIH	National Institute of Health
NO_2	nitrogen dioxide

Acronym/Abbreviation	Definition
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NTP	Notice to Proceed
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSE	nonessential experimental population
NSR	noise sensitive receptor
NWI	National Wetland Inventory
NWP	Nationwide Permit
NWR	National Wildlife Refuge
O&M	operations and maintenance
O_3	ozone
OHV	off-highway vehicle
OPGW	optical ground wire
OS	open space
OSHA	Occupational Safety and Health Act
PA	Programmatic Agreement
Pb	lead
PCN	preconstruction notification
PDEIS	Preliminary Draft Environmental Impact Statement
PFCs	perfluorocarbons
PFYC	Potential Fossil Yield Classification
PILT	Payments in Lieu of Taxes
PLSS	Public Land Survey System
PM	particulate matter
PM_{10}	particulate matter smaller than 10 microns in aerodynamic diameter
$PM_{2.5}$	particulate matter smaller than 2.5 microns in aerodynamic diameter

Acronym/Abbreviation	Definition
POD	Plan of Development
PPA	power purchase agreement
ppb	parts per billion
ppm	parts per million
Project	Ten West Link 500kV Transmission Line Project
PSD	Prevention of Significant Deterioration
PSSCFO	Palm Springs-South Coast Field Office
PUP	pesticide use proposal
PVNGS	Palo Verde Nuclear Generating Station
RCFD	Riverside County Fire Department
RCRA	Resource Conservation and Recovery Act
RCRPOSD	Riverside County Regional Parks and Open Space District
Reclamation	U.S. Bureau of Reclamation
ReGAP	Regional Gap Analysis
RMP	Resource Management Plan
RMZ	Resource Management Zone
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
ROW	right-of-way
RTP	Regional Transportation Plan
RV	recreational vehicle
S	Sensitive
SA	Salvage Assessed
SB	Senate Bill
SBR	sequencing batch reactor
SCADA	supervisory control and data acquisition
SCE	Southern California Edison Company
SDG&E	San Diego Gas & Electric
SEIR	Supplemental Environmental Impact Report
SF_6	sulfur hexafluoride
SFHA	Special Flood Hazard Area

Acronym/Abbreviation	Definition
SGCN	Species of Greatest Conservation Need
SHPO	State Historic Preservation Office
SIL	Significant Impact Level
SIP	State Implementation Plan
SMARA	Surface Mining and Reclamation Act
SO_2	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasures
SQRU	Scenic Quality Rating Unit
SR [#]	State Route [#]
SR	Salvage Restricted
SRI	Statistical Research, Inc.
SRMA	Special Recreation Management Area
SRP	Special Recreation Permit
ST	short term
SU	Special Use
SWCC	Southwest Coordination Center
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
T	threatened
TCP	Traditional Cultural Property
THPO	Tribal Historic Preservation Officer
TLV	threshold limit values
TMDL	total maximum daily load
TMP	Travel Management Plan
TNW	Traditional Navigable Water
tpy	tons per year
US	United States
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service

Acronym/Abbreviation	Definition
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
VFR	visual flight rules
v/m	volt per meter
VOCs	Volatile Organic Compounds
VPL	Variance Process Lands
VRI	Visual Resource Inventory
VRM	Visual Resource Management
WA	Wilderness Area
WECC	Western Electricity Coordinating Council
WEG	wind erodibility group
WHB	wild horses and burros
WHO	World Health Organization
WHMA	Wildlife Habitat Management Area
WOUS	Waters of the US
WRCC	Western Regional Climate Center
WSA	Wilderness Study Area
WQARF	Water Quality Assurance Revolving Fund
WWEC	West-wide Energy Corridor
WWII	World War II
YFO	Yuma Field Office
YPG	Yuma Proving Ground
yr	year

5.3 GLOSSARY

Activity Footprint. The area of long- and short-term ground disturbance associated with the pre-construction, construction, operation, implementation, maintenance, and decommissioning of an activity, including associated linear and non-linear components, such as staging areas, access routes and roads, gen-ties, other utility lines, borrow pits, disposal areas, etc. May also be considered synonymous with activity site, activity area, or activity boundary.

Administrative Route. A designated road, primitive road, or trail on BLM-managed public lands that is limited to BLM-authorized official use. Official use is defined in 43 CFR 8340 as, "Use by an employee, agent, or designated representative of the Federal Government or one of its contractors, in the course of his employment, agency, or representation."

Adverse visual impact. Any modification of landforms, water bodies, or vegetation, or any introduction of structures, which negatively interrupts the visual character of the landscape and disrupts the harmony of the basic elements (that is, form, line, color, and texture).

Air Quality. A measure of the health-related and visual characteristics of the air, often derived from quantitative measurements of the concentrations of specific injurious or contaminating substances.

Alluvial. Pertaining to material or processes associated with transportation or deposition of soil and rock by flowing water (e.g., streams and rivers).

Alluvium. Soil and rock deposited by flowing water (e.g., streams and rivers); consists of unconsolidated deposits of sediment, such as silt, sand, and gravel.

Alternative. Any one of a number of options for a project.

Ambient. Surrounding, existing, background conditions.

Animal unit month (AUM). The amount of forage necessary to sustain one cow and one calf (e.g., a 1,000-pound cow and calf) for a period of one month.

Annual (ecology). A plant that completes its development in one year or one season and then dies.

Anthropogenic (climate change/global warming). Resulting from or produced by human beings.

Aquatic. Growing or living in or near the water.

Aquifer. A water-bearing rock unit (unconsolidated or bedrock) that will yield water in a usable quantity to a well or spring.

Archaeological site. A discrete location that provides physical evidence of past human use.

Archaeology. The scientific study of the life and culture of past, especially ancient, peoples, as by excavation of ancient cities, relics, artifacts, etc.

Area of Critical Environmental Concern. A BLM designation pertaining to areas where specific management attention is needed to protect and prevent irreparable damage to important historical, cultural, and scenic values, fish or wildlife resources, or other natural systems or processes, or to protect human life and safety from natural hazards.

Arroyo. A dry gully, or a stream in a dry region.

Artifact. Any object showing human workmanship or modification, especially from a prehistoric or historic culture.

Avoid to the Maximum Extent Practicable. A standard identified in the DRECP LUPA CMAs and applied to implementation of activities. Under this standard, impacts to identified resources are not allowed unless there is no reasonable or practicable means of avoidance that is consistent with the basic objectives of the activity. Compensation for unavoidable impacts would be required as specified in the CMAs. The term "maximum extent practicable" as used here in the DRECP LUPA is applicable only to its use in the CMAs; it does not apply to the term as it is used in the Endangered Species Act of 1973.

Backfill. The excavated material (soil and/or rock) used to refill a hole/trench created during construction activities (i.e., drilling foundation holes). The excavated material used to fill a hole/trench in the groundbed (i.e., structure foundations). The composition of the backfill varies based on the soil type at the excavation site and the component being covered.

Background (visual). That portion of the visual landscape lying from the outer limit of the middleground to infinity. Color and texture are subdued in this area, and visual sensitivity analysis here is primarily concerned with the two-dimensional shape of landforms against the sky.

Background distance zone. The visible area of a landscape that lies beyond the foreground-middleground. Visibility from 5 miles to a maximum distance of approximately 15 miles from a travel route, use area, or other observer platform. Atmospheric conditions in some areas may limit the maximum distance to approximately 8 miles or less.

Basic Elements (visual). The four major elements (form, line, color, and texture) that determine how the character of a landscape is perceived.

Baseline. The existing conditions against which impacts of the proposed action and its alternatives can be compared.

Basin. A depressed area having no surface outlet (topographic basin); a physiographic feature or subsurface structure that is capable of collecting, storing, or discharging water by reason of its shape and the characteristics of its confining material (water); a depression in the earth's surface, the lowest part often filled by a lake or pond (lake basin); a part of a river or canal widened (drainage, river, stream basin).

Best Management Practices (BMPs). Vegetative and structural methods to control erosion and sedimentation.

Big Game. Large species of wildlife that are hunted (such as elk, mule deer, and pronghorn antelope).

Biological monitoring. Visual survey of an area conducted by a designated biologist to determine if a biological resource is present. Biological monitoring is commonly conducted on the sites of proposed projects. Biological monitoring conducted during the implementation of activities is used to implement DRECP BLM LUPA CMAs that require construction setbacks or that require the designated biologist to move a biological resource out of harm's way.

Butte. A steep hill standing alone in a plain.

California Ambient Air Quality Standards (CAAQS). The allowable concentrations of air pollutants in the air specified by the State of California and established by the California Clean Air Act. The standards include the same pollutants regulated under the NAAQS and some additional pollutants, including hydrogen sulfide, sulfates, and vinyl chloride. Air quality standard setting in California commences with a critical review of all relevant peer reviewed scientific literature. The Office of Environmental Health Hazard Assessment (OEHHA) uses the review of health literature to develop a recommendation for the standard. The recommendation can be for no change, or can recommend a new standard. The review, including the OEHHA recommendation, is summarized in a document called the draft Initial Statement of Reasons (ISOR), which is released for comment by the public, and also for public peer review by the Air Quality Advisory Committee (AQAC). AQAC members are appointed by the President of the University of California for their expertise in the range of subjects covered in the ISOR, including health, exposure, air quality monitoring, atmospheric chemistry and physics, and effects on plants, trees, materials, and ecosystems.

Candidate Species. A plant or animal species not yet officially listed as threatened or endangered under the Endangered Species Act, but which is undergoing status review by the U.S. Fish and Wildlife Service.

C**haracteristic landscape.** The established landscape in an area being viewed. This does not necessarily mean a naturalistic character. It could refer to an agricultural setting, an urban landscape, a primarily natural environment, or a combination of these types.

Clean Air Act of 1990. Federal legislation governing air pollution. The Clean Air Act established National Ambient Air Quality Standards for carbon monoxide, nitrogen oxide, ozone, particulate matter, sulfur dioxide, and lead. Prevention of Significant Deterioration classifications define the allowable increased levels of air quality deterioration above legally established levels and include the following:

Class I – minimal additional deterioration in air quality (certain national parks and wilderness areas)

Class II – moderate additional deterioration in air quality (most lands)

Class III – greater deterioration for planned maximum growth (industrial areas)

Clean Water Act of 1987. National environmental law enforced by the U.S. Environmental Protection Agency that regulates water pollution.

Clearance Survey. Survey for Focus and BLM Special-Status Species conducted immediately prior to vegetation and/or ground disturbance from activities, as per the CMAs. Clearance surveys must be conducted throughout the DRECP BLM LUPA Decision Area and in accordance with applicable species-specific CMAs and protocols, as approved by BLM and the applicable Wildlife Agencies, to detect and clear (i.e., remove, translocate) out of harm's way individuals of a species prior to disturbance.

Contrast (visual). Opposition or unlikeness of different forms, lines, colors, or textures in a landscape.

Contrast rating. A method of analyzing the potential visual impacts of proposed management activities.

Consulting Party under NPHA Section 106. A consulting party under Section 106 of NHPA assists the federal agency in identifying historic properties potentially affected by an undertaking, assessment of the undertaking's effects, and identifying ways to avoid, minimize, or mitigate any adverse effects to historic properties. Consultation is the process of seeking, discussing, and considering the views of other participants, and, where feasible, seeking agreement with them regarding matters arising in the Section 106 process. The following parties are entitled to participate as consulting parties during Section 106 review: Advisory Council on Historic Preservation; State Historic Preservation Officers; Federally recognized Indian tribes/THPOs; Native Hawaiian organizations; local governments; and applicants for Federal assistance, permits, licenses, and other approvals.

Cooperating Agency. Assists the lead Federal agency in developing an environmental assessment or environmental impact statement. The Council on Environmental Quality regulations implementing NEPA define a cooperating agency as any agency that has jurisdiction by law or special expertise for proposals covered by NEPA (40 CFR 1501.6). Any Federal, state, or local government jurisdiction with such qualification may become a cooperating agency by agreement with the lead agency.

Council on Environmental Quality (CEQ). An advisory council to the President established by the National Environmental Policy Act of 1969. It reviews Federal programs for their effort on environmental studies and advises the President on environmental matters.

Creosote Bush Rings. Rings of creosote bush (*Larrea tridentata*) that form over long periods of time. As a single creosote bush produces new branches at the periphery of its crown, the branches in the center of the crown begin to die. Eventually a sterile area of bare ground occupies the center of the original shrub, and as the ring becomes larger the original shrub segments into several shrubs (satellites), forming a ring around the point where the original shrub originated. As more time goes by these rings become elliptical rather than circular. The satellite shrubs in a ring are the same genetically, attesting to the fact that they form a single clone originating from one original shrub. Vasek (1980) showed that some of these clones are several thousand years old. The largest known creosote ring is 20.5 feet in diameter and may be 11,700 years old.

Cubic feet per second (CFS). Unit of discharge, or volume rate of flow, equal to 0.0283 cubic meters per second. As a rate of streamflow, a cubic foot of water passing a referenced section in one second. A measure of a moving volume of water.

Cultural Resources. Remains of human activity, occupation, or endeavor as reflected in districts, sites, buildings, objects, artifacts, ruins, works of art, architecture, and natural features important in human events.

Cumulative effect (or impact). As defined in the CEQ Regulations at §1508.7, the cumulative impact is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. These impacts may result from individually minor but collectively significant actions taking place over a period of time.

dBA. The sound pressure levels in decibels measured with a frequency weighing network corresponding to the A-scale on a standard sound level meter. The A-scale tends to suppress lower frequencies (e.g., below 1,000 Hz).

Decibel (dB). One-tenth of a Bel is a measure on a logarithmic scale that indicates the ratio between two sound powers. A ratio of 2 in power corresponds to a difference of 3 decibels between two sounds. The decibel is the basic unit of sound measure.

Designated Biologist. A biologist who is approved as qualified by BLM, and U.S. Fish and Wildlife Service (USFWS) and CDFW, as appropriate. A designated biologist is the person responsible for overseeing compliance with specific applicable DRECP BLM LUPA biological CMAs.

Developed land. For purposes of this analysis, the term "developed land" is defined to mean property that has been developed for residential, commercial, recreation, or other uses and contains the required infrastructures for those uses. This definition also includes all the required infrastructure needed for lots to be home sites and are marketed as such, including things such as roads and utilities.

Direct effect. See effect.

Discharge. Outflow of surface water in a stream or canal (water). Discharge from an industrial facility that may contain pollutants harmful to fish or animals if it is released into nearby water bodies usually requires a permit issued by the U.S. Environmental Protection Agency and is monitored.

Displacement. When one or more wildlife individual abandons a habitat because the habitat is no longer suitable, and must seek out alternative habitat, which may or may not be adjacent. If the abandonment of habitat is caused by a disturbance, wildlife individuals may or may not return to the habitat after the disturbance is no longer present.

Distance zones. A subdivision of the landscape as viewed from an observer position. The subdivision (zones) includes foreground, middleground, and background, and is seldom seen.

Drainage. The natural or artificial removal of surface water and groundwater from a given area. Many agricultural soils need drainage to improve production or to manage water supplies.

Easement. A right afforded to a person, agency, or organization to make limited use of another's real property for access or other purposes.

Effect (impact). A modification of the existing environment as it presently exists, caused by an action (such as construction or operation of facilities). An effect may be direct, indirect, or cumulative. The terms effect and impact are synonymous under the NEPA.

A direct effect is caused by an action and occurs at the same time and same place (40 CFR 1508.8(a)).

An indirect effect is caused by the action later in time or farther removed in distance, but is still reasonably foreseeable (40 CFR 1508.8(b)). Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water or other natural systems including ecosystems.

Electromagnetic field (EMF). Also called electric and magnetic fields. An electric field is the region around a conductor where a force will be experienced by an electric current or charge. A magnetic field is the region around a current where a moving charge will experience a force. Extremely low frequency EMF is the type associated with transmission lines.

Emission. Effluent discharged into the atmosphere, usually specified by mass per unit time, and considered when analyzing air quality.

Endangered Species. Species in danger of extinction throughout all or a significant portion of its range. Endangered species are rarely identified by the Secretary of the Interior in accordance with the Endangered Species Act of 1973.

Endangered Species Act (ESA) of 1973. Provides a means whereby the ecosystems upon which threatened and endangered species depend may be conserved and to provide a program for the conservation of such threatened and endangered species. The ESA requires all Federal agencies to seek to conserve threatened and endangered species, use applicable authorities in furtherance of the purposes of the ESA, and avoid jeopardizing the continued existence of any species that is listed or proposed for listing as threatened and endangered or destroying or adversely modifying its designated or proposed critical habitat. The U.S. Fish and Wildlife Service is responsible for administration of this act.

Environmental Impact Statement (EIS). A document prepared to analyze the impacts on the environment of a proposed action and released to the public for review and comment. An EIS must meet the requirements of NEPA, CEQ, and the directives of the agency responsible for the proposed action.

Environmental Justice. The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, local, and tribal programs and policies (see Executive Order 12898).

Ephemeral stream (wash, creek, waterbody). A stream or portion of a stream which flows briefly in direct response to precipitation in the immediate vicinity, and whose channel is at all times above the water table.

Erosion. The wearing away of the land surface by running water, wind, ice, or other geological agents and by such processes as "gravitation creep."

Extremely low frequency (ELF). Invisible lines of force that you cannot feel that surround electrical equipment, power cords, wires that carry electricity, and outdoor power lines.

Federal Land Policy and Management Act of 1976 (FLPMA). Public Law 94-579 signed by the President on October 21, 1976. Established public land policy for management of lands administered by the Bureau of Land Management (BLM). FLPMA specifies several key directions for the BLM, notably: (1) management on the basis of multiple use and sustained yield; (2) land use plans prepared to guide management actions; (3) public lands for the protection, development, and enhancement of resources; (4) public lands retained in Federal ownership; and (5) public participation used in reaching management decisions.

Federal Register. Published by the Office of the Federal Register, National Archives, and Records Administration, the *Federal Register* is the official daily publication for rules, proposed rules, and notices of Federal agencies and organizations, as well as executive orders and other presidential documents.

Floodplain. The low and relatively flat areas adjacent to rivers and streams. A 100-year floodplain is that area subject to a 1 percent or greater chance of flooding in any given year.

Forage. Vegetation used for food by wildlife, particularly big game wildlife and domestic livestock.

Foreground (visual). The visible area from a viewpoint or use area out to a distance of 0.5 mile. The ability to perceive detail in a landscape is greatest in this zone.

Foreground-middleground distance zone. The area visible from a travel route, use area, or other observation platform to a minimum distance of 0 to 5 miles. The outer boundary of this zone is defined as the point where the texture and form of individual plants are no longer apparent in the landscape. Vegetation is apparent only in patterns or outline.

Forbs. Any herbaceous plant other than a grass.

Form. The mass or shape of an object or objects that appears unified, such as a vegetative opening in a forest, a cliff or mountain formation, a water tank, or a highway overpass.

Fossil. Any remains, trace, or imprint of a plant or animal that has been preserved by natural process in the earth's crust since some past geologic time.

Game Species. Animals commonly hunted for food or sport.

Gauss (G). A unit used for measuring magnetic flux density fields. Since gauss is a large measure, milligauss (mG) is more commonly used for environmental measurements. One gauss equals 1,000 milligauss, 10,000 gauss equal 1 tesla.

Geographic Information System (GIS). A system of computer hardware, software, data, people, and applications that capture, store, edit, analyze, and graphically display a potentially wide array of geospatial information.

Geology. The science that relates to the earth, the rocks of which it is composed, and the changes that the earth has undergone or is undergoing.

Geothermal Resource. Heat found in rocks and fluids at various depths within the earth's crust that can be extracted by drilling or pumping for use as an energy source. This heat may be residual heat, friction heat, or a result of radioactive decay.

Global Warming. An increase in the average temperature of the earth's atmosphere and oceans. The term is also used to describe the theory that increasing temperatures are the result of a strengthening greenhouse effect caused primarily by manmade increases in carbon dioxide and other greenhouse gases.

Greenhouse Gases (GHGs). The warming of the earth and its atmosphere through the trapping of heat from the sun by gases, known as greenhouse gases, in the earth's atmosphere.

Groundwater. Subsurface water that fills available openings in rock or soil materials to the extent that they are considered water saturated.

Habitat. A specific set of physical conditions in a geographic area(s) that surrounds a single species, group of species, or large community. In wildlife management, the major components of habitat are food, water, cover, and living space.

Habitat assessment. As required in LUPA-BIO CMAs. Use of the DRECP land cover mapping and/or species model(s), as well as reconnaissance-level site visits and available aerial photography for confirmation of site conditions and mapping of vegetation types and species′ suitable habitat. For all activities, a habitat assessment will be required to assess site-specific vegetation types and Focus and BLM Special-Status Species.

Historic Property. Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria.

Hydrology. The study of the movement, distribution, and quality of water throughout the earth, addresses both the hydrologic cycle and water resources.

Hydrographic basin (area, region, unit). A geographic area drained by a single major stream or an area consisting of a drainage system comprised of streams and often natural or man-made lakes. See also basin.

Impact. See effect.

Indian Tribe. An Indian tribe, band, nation, or other organized group or community, including a native village, regional corporation, or village corporation, as those terms are defined in section 3 of the Alaska Native Claims Settlement Act (43 U.S.C. 1602), which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.

Indirect effect. See effect.

Infrastructure. The facilities, services, and equipment needed for a community or facility to function, such as and including roads, sewers, water lines, and electric lines.

Intermittent. A river or stream that flows for a period of time, usually seasonally during rainy periods, and stops during dry periods. In arid regions, dry periods may be interrupted by occasional flash floods from brief but intense rain storms.

Invasive Species. Describes a large number of non-native plant species whose introduction causes or is likely to cause economic or environmental harm or harm to human health.

Joshua Tree Woodlands. Evenly distributed with Joshua trees at ≥1% and *Juniperus* and/or *Pinus* spp <1% absolute cover in the tree canopy (Thomas et al. 2004).

Key Observation Point (KOP). One or a series of points on a travel route or at a use area or potential use area, where the view of a management activity would be most revealing.

Kilovolt (kV). A unit of power equivalent to 1,000 volts. A volt is a measure of electrical potential difference that would cause a current of 1 ampere to flow through a conductor whose resistance is 1 ohm.

Labor Force. All persons 16 years of age or over who are either employed or unemployed and actively looking for a job.

Landform. A term used to describe the many land surfaces that exist as a result of geologic activity and weathering (e.g., plateaus, mountains, plains, and valleys).

Land Use Plan. The organized direction or management of the use of lands and their resources to best meet human needs over time, according to the land's capabilities.

Laydown Area. An area where construction material and equipment are staged during a construction operation.

Lease. An authorization or contract by which one party (lessor) conveys the use of property to another (lessee) in return for rental payments. In cases of resource production, lessees pay royalties to the lessor in addition to rental payments.

Long-term Impacts. Ground and/or vegetation disturbance that results in impacts lasting greater than 2 years.

Long-term visitor area (LTVA)

LTVAs are specially designated areas on BLM lands in California and Arizona. LTVAs provide places for visitors to stay for up to 180 days between September and April.

Megawatt (MW). A unit for measuring power equal to one million watts. The productive capacity of electrical generators is measured in megawatts.

Mesa. An isolated, nearly level land mass, formed on nearly horizontal rocks, standing above the surrounding country, and bounded with steep sides.

Microphyll Woodlands. Consist of drought-deciduous, small-leaved (*microphyllus*), mostly leguminous trees. Occurs in bajadas and washes where water availability is somewhat higher than the plains occupied by creosote bush and has been called the "riparian phase" of desertscrub (Webster and Bahre 2001). Composed of the following alliances: desert willow, mesquite, smoke tree, and the blue palo verde-ironwood.

Minor Incursion. Small-scale allowable impacts to sensitive resources, as per specific CMAs, that do not individually or cumulatively compromise the conservation objectives of that resource or rise to a level of significance that warrants development and application of more rigorous CMAs or a LUPA amendment. Minor incursions may be allowed to prevent or minimize greater resource impacts from an alternative approach to the activity. Not all minor incursions are considered unavoidable impacts.

Mitigation. Actions to avoid, minimize, reduce, eliminate, replace, or rectify the impact of a management practice.

National Ambient Air Quality Standards (NAAQS). The allowable concentrations of air pollutants in the air specified by the Federal government and established by the Clean Air Act. The air quality standards are divided into primary standards (based on the air quality criteria and allowing an adequate margin of safety and requisite to protect the public health) and secondary standards (based on the air quality criteria and allowing an adequate margin of safety and requisite to protect the public welfare) from any unknown or expected adverse effects of air pollutants.

National Environmental Policy Act (NEPA) of 1969. Our nation's basic charter for protection of the environment. It establishes policy, sets goals, and provides means for carrying out the policy. In accordance with NEPA, all Federal agencies must prepare a written statement on the environmental impacts of a proposed action. The provisions to ensure that Federal agencies act according to the letter and spirit of NEPA are the CEQ regulations for implementing NEPA 943 CFR 1500-1508).

National Register of Historic Places. A listing, maintained by the Secretary of the Interior, of districts, sites, buildings, structures, and objects worthy of preservation. To be eligible a property must normally be at least 50 years old, unless it has exceptional significance, and have national, state, or local significance in American history, architecture, archaeology, engineering, or culture; and possess integrity of location, design, setting, material, workmanship, feeling, and association; and (a) be associated with events that have made a significant contribution to the broad pattern of history, (b) be associated with the lives of persons significant to our past, (c) embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; possess high artistic values; or represent a significant and distinguishable entity whose components may lack individual distinction; or (d) have yielded, or may be likely to yield, information important to prehistory or history.

National Wildlife Refuge (NWR). NWR is a designation for certain protected areas managed by the U.S. Fish and Wildlife Service. NWRs are public.

Negligible (impact). Unless otherwise specified, "negligible" indicates impacts of such a small scale such as to be non-measurable.

Non-attainment Area. An air quality control region (or portion thereof) in which the U.S. Environmental Protection Agency has determined that ambient air concentrations exceed national ambient air quality standards for one or more criteria pollutants.

Noxious Weed. Nonnative plant species that negatively impact crops, native plant communities, and/or management of natural or agricultural systems. Noxious weeds are officially designated by a number of states and Federal agencies.

Off-highway vehicle. A vehicle specifically designed for off-highway use.

Perennial (vegetation). A plant whose root remains alive more than two years.

Perennial Stream. A stream that flows throughout the year and from source to mouth.

Physiographic province. An extensive portion of the landscape normally encompassing many hundreds of square miles, which portrays similar qualities of soil, rock, slope, and vegetation of the same geomorphic origin such as the Basin and Range province where this Project is situated.

$PM_{2.5}$. Particulate matter less than 2.5 microns in aerodynamic diameter.

PM_{10}. Particulate matter less than 10 microns in aerodynamic diameter.

Prime Farmland. A special category of highly productive cropland that is recognized and described by the U.S. Department of Agriculture's Soil Conservation Service and receives special protection under the Surface Mining Law of 1977.

Programmatic Agreement. A document that records the terms and conditions agreed upon to resolve the potential adverse effects of a Federal agency program, complex undertaking, or other situations in accordance with § 800.14(b) of the NHPA.

Project Area. The area of land which the project would encompass.

Protocol survey. Species-specific surveys that are conducted under a protocol that has been adopted by the Wildlife Agency(ies) or is otherwise scientifically accepted for determining the occupancy or presence and absence of Covered Species. These surveys would be required as specified in the species-specific CMAs in the DRECP BLM LUPA.

Public Land. Land or interest in land owned by the United States and administered through agencies such as the BLM and USBR without regard to how the United States acquired ownership, except lands on the Outer Continental Shelf, and land held in trust for the benefit of American Indians, Aleuts, and Eskimos.

Radio frequency. Electromagnetic energy in the approximate frequency range of 3,000 Hz (3 kHz) to 1 billion Hz (l gHz).

Range. A large, open area of land over which livestock can wander and graze.

Raptor. A bird of prey (e.g., eagles, hawks, falcons, and owls).

Reclamation. Restoration of land disturbed by natural or human activity (e.g., mining, pipeline construction) to original contour, use, or condition. Also describes the return of land to alternative uses that may, under certain circumstance, be different from those prior to disturbance.

Recontouring. Return a land surface to or near to its original form through earth-moving equipment such as front-end loaders, backhoes, hand rakes, hoes, shovels, etc.

Record of Decision. A document separate from, but associated with, an EIS that publicly and officially discloses the responsible official's decision on a proposed action.

Revegetation. The reestablishment and development of self-sustaining plant cover. On disturbed sites, this normally requires human assistance such as reseeding.

Right-of-way. Land authorized to be used or occupied for the construction, operation, maintenance, and termination of a project, such as a road or utility.

Riparian. Situated on or pertaining to the bank of a river, stream, or other body of water. Riparian is normally used to refer to plants of all types that grow along streams, rivers, or at spring and seep sites.

Resource Management Plan. Document that establishes direction for the use of resources to best meet the needs of humans over time, according to the resource potential or capability.

Scoping. Procedures by which agencies determine the extent of analysis necessary for a proposed action (i.e., the range of actions, alternatives, and impacts to be addressed; identification of significant issues related to a proposed action; and the depth of environmental analysis, data, and task assignments needed).

Sediment. Solid fragmental material, either mineral or organic, that is transported or deposited by air, water, gravity, or ice.

Sedimentation. The result when soil or mineral is transported by moving water, wind, gravity, or glaciers and deposited in streams or other bodies of water, or on land. Also, letting solids settle out of wastewater by gravity during treatment.

Sensitive Species. Those plant or animal species that are susceptible or vulnerable to activity impacts or habitat alterations.

Setback. A defined distance, usually expressed in feet or miles, from a resource feature (such as the edge of a vegetation type or an occupied nest) within which an activity would not occur; otherwise often referred to as a buffer. The purpose of the setback is to maintain the function and value of the biological resource features identified in the DRECP BLM LUPA CMAs. See Section II.3.4.2.1 for a summary of setbacks incorporated in the CMAs.

Scenic quality. Scenic quality is a measure of the visual appeal of a tract of land. In the visual resource inventory process, public lands are given an A, B, or C rating based on the apparent scenic quality that is determined using seven key factors: landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications.

Sensitivity level. Sensitivity levels are a measure of public concern for scenic quality. Public lands are assigned high, medium, or low sensitivity levels by analyzing the various indicators of public concern including type of use, amount of use, public interest, adjacent land uses, special areas, and other factors.

Short-term Impacts. Ground and/or vegetation impacts that result in effects lasting 2 years or less.

Significant Impact Level (SIL). The SIL is a de minimis threshold applied to individual facilities that apply for a permit to emit a regulated pollutant in an area that meets the NAAQS. The state and EPA must determine if emissions from that facility will cause the air quality to worsen. The SIL is a measure of whether a source may cause or contribute to a violation of PSD increment or the NAAQS, i.e. a significant deterioration of air quality.

Simulation. A realistic visual portrayal that demonstrates the perceivable changes in landscape features caused by a proposed management activity. This is done using photography, artwork, computer graphics, and other such techniques.

Special Recreation Management Area (SRMA). SRMAs are areas officially designated by statute or Secretarial order, including components of the National Trails System, the National Wild and Scenic Rivers System, the National Wilderness System, National Conservation Areas, National Monuments or National Recreation Areas, an area covered by joint agreement between the BLM and a state government, or any area where the authorized officer determines that the resources require special management and control measures for their protection, and where a permit system for individual use would achieve management objectives.

Special Status Species. Wildlife and plant species either Federally listed or proposed for listing as endangered or threatened; state-listed; or priority species of concern to Federal agencies or tribes.

Substation. A facility where electrical voltage is either increased or decreased through the use of transformers; electric lines are interconnected at one or more voltage; and electric power is metered and regulated to provide safe and stable voltage for end-use customers.

Suitable habitat. In general, Focus and BLM Special-Status Species habitat consisting of land within a species range that has—in the case of wildlife, breeding and foraging habitat characteristics required by the species, or in the case of plants, vegetation and microhabitat characteristics—consistent with known or likely occurrences, as determined by the habitat assessment. In the California Desert Conservation Framework modeled habitat as determined by species distribution models and confirmed or refined (i.e., expanded or reduced) by activity- level habitat assessment and that require site-specific protocol or presence/absence surveys as specified in the species-specific DRECP BLM LUPA CMAs.

Texture. The visual manifestations of the interplay of light and shadow created by the variations in the surface of an object or landscape.

Threatened Species. Any species of plant or animal which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

Traditional Cultural Property. A Traditional Cultural Property (TCP), as defined in the NHPA, is a property that is eligible for inclusion on the NRHP because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community. Stated another way, a significant TCP is defined as a property with significance derived from the role the property plays in a community's historically rooted beliefs, customs, and practices.

Transportation Corridor. A BLM- designated corridor that would reduce resource impacts while allowing for linear ROWs for development of new transportation routes or expansion of existing roads within the designated corridor. However, corridor designation does not automatically result in authorization of requested ROWs within the corridor. Each requested ROW would require environmental analysis and evaluation of compatibility of the proposed ROW with any existing ROWs within the corridor.

Tribal Land. All lands within the exterior boundaries of any Indian reservation and all dependent Indian communities.

Unavoidable impacts to resources. Small-scale impacts to sensitive resources, as allowed per specific CMAs, that may occur even after such impacts have been avoided to the maximum extent practicable (see definition). Unavoidable impacts are limited to minor incursions (see definition), such as a necessary road or pipeline extension across a sensitive resource required to serve an activity.

Undertaking. A project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; those requiring a Federal permit, license, or approval; and those subject to state or local regulation administered pursuant to a delegation or approval of a Federal agency.

Undeveloped Land. For purposes of this analysis, the term "undeveloped land" is defined to mean land that does not have existing residential or commercial buildings, facilities, or uses. Undeveloped land may be private lands that are part of a master planned community that is not yet fully developed to include residential or commercial facilities or uses, and may be in varying stages of planning or preparation for development.

Utility Corridor. Designated through land use planning to promote compatible, systematic, and predictable development on Federal lands to expedite permitting and reduce impacts to natural, economic and cultural resources from linear ROWs. However, corridor designation does not automatically result in authorization of requested ROWs within the corridor. Each requested ROW would require environmental analysis and evaluation of compatibility of the proposed ROW with any existing ROWs within the corridor.

Vegetation communities. Species of plants that commonly live together in the same region or ecotone.

Viewing platform. A point such as a scenic overlook, or route such as a highway or trail where observers would be viewing the surrounding landscape.

Viewshed. Visible portion of the specific landscape seen from a specific viewpoint, normally limited by landform, vegetation, distance, and existing cultural modifications.

Visibility. The distance to which an observer can distinguish objects from their background. The determinants of visibility include the characteristics of the target object (shape, size, color, pattern), the angle and intensity of sunlight, the observer's eyesight, and any screening present between the viewer and the object (i.e., vegetation, landform, even pollution such as regional haze).

Visual quality. The relative worth of a landscape from a visual perception point of view.

Visual resource. The visible physical features on a landscape (for example, land, water, vegetation, animals, structures, and other features).

Visual resource inventory. A BLM inventory tool that portrays the relative value of the existing visual resources of an area.

Visual resource management classes. Four management categories assigned to public lands based on scenic quality, sensitivity level, and distance zones. Each class has an objective that prescribes the amount of change allowed in the characteristic landscape.

VRM Class I Objective - The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

VRM Class II Objective - The objective to this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

VRM Class III Objective - The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

VRM Class IV Objective - The objective of this class is to provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

Waters of the United States (WOUS). All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce including adjacent wetlands and tributaries to water of the United States; and all waters by which the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce.

Watershed. Drainage basin for which surface water flows to a single point.

Wetlands. Areas inundated by surface water or groundwater with a frequency sufficient to support vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction.

Wilderness. An area formally designated by Congress as part of the National Wilderness Preservation System.

Wilderness Area (WA). WAs are designated under the Wilderness Act. They generally do not allow motorized equipment, motor vehicles, mechanical transport, temporary roads, or permanent structures or installations (with exceptions in Alaska). WAs are to be primarily affected by the forces of nature, although the Act does acknowledge the need to provide for human health and safety, protect private property, control insect infestations, and fight fires in the area.