

APPENDIX K

TRAFFIC ASSESSMENT AND TRIP GENERATION REPORT

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Administrative Draft

Technical Memorandum

Date: June 29, 2018

To: Aarty Joshi, Senior Manager, Environmental Permitting
NRG Renewables

From: Andrew Lintz, Senior Engineer
Tetra Tech, Inc.

Re: Daggett Solar Power Facility Project Traffic Assessment and Trip Generation

Introduction

This Transportation and Traffic Assessment (assessment) presents a transportation analysis for the proposed Daggett Solar Power Facility for Daggett Solar Power 1, LLC (Applicant). The Applicant is proposing to develop the Daggett Solar Power Facility (project) in San Bernardino County, east of Daggett, California (Figure 1).

The proposed project consists of construction and operation of a utility-scale solar photovoltaic (PV) electricity generation and energy storage facility that would produce up to 650 megawatts (MW) of power and include up to 450 MW of battery storage capacity on approximately 3,500 acres of land. The project would utilize existing electrical transmission infrastructure adjacent to the existing Coolwater Generating Station, a recently retired natural gas-fired power plant, to deliver renewable energy to the electric grid.

The project site is flat and is generally bounded by the town of Daggett approximately 0.5 mile to the west; the Mojave River, the town of Yermo, and Interstate 15 (I-15) to the north; Barstow-Daggett Airport, Route 66, and Interstate 40 (I-40) to the south; and the community of Newberry Springs and the Mojave Valley to the east. County zoning for the project site allows for the development of renewable energy generation facilities with a Conditional Use Permit (CUP). The project is anticipated to be constructed in three phases and is seeking six separate CUPs to facilitate project phasing and financing. The phases would share certain facilities, such as the on-site project substations and generation tie (gen-tie) line. Development would occur on privately-owned land.

Project Location

The project site is located east of Barstow and Daggett, south of Interstate 15 and the Mojave River, and north of Interstate 40, and adjacent to Barstow-Daggett Airport. The project area is situated within Sections 13, 23, and 24 in Township 9 North, Range 1 East, and Sections 7, 8, 15-19, 21, and 23 in Township 9 North, Range 2 East.

The project site is located within four U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles in California: Yermo, Minneola, Harvard Hill, and Newberry Springs. The project site is located at approximately latitude/longitude 34° 52' 0" N/116° 48' 0" W. Figure 1 shows the project location.

Construction Phases

The project is expected to be constructed in three phases, ranging in size from approximately 200 MW to 250 MW. While there may be overlap during construction of two of the three phases (i.e., restoration stage of one phase and mobilization stage of the next phase), major construction is expected to occur separately. Project facilities such as the on-site substations, gen-tie, and operations and maintenance (O&M) building would be shared among the individual CUPs and phases. Final construction phasing would be determined during final design and prior to construction of that particular phase.

For purposes of California Environmental Quality Act (CEQA) analysis, it is assumed that up to two phases, or 400 MW, could be constructed at one time, with the remaining 250 MW occurring subsequently with no overlap. Resource evaluations analyze a 400-MW and a 250-MW phase.

The Applicant anticipates that construction would occur over a 27-month period for Phase 1 and 2 (together a 400-MW facility for the purposes of CEQA evaluation) and a 19-month period for Phase 3 (250-MW facility).

Construction Activities

The following assumptions were used in determining the potential transportation/traffic impacts of the proposed project:

- Project construction all phases is anticipated to last up to 46 months.
- Construction work would be from Monday through Friday, during daytime hours. No weekend work is predicted at this time, but may be an option to the Contractor as needed.
- Construction would be comparable to other renewable energy projects and is anticipated to be divided into the following sequence:
 - Roads, grading, and fencing
 - Electrical infrastructure
 - PV assembly and installation
 - Substation interconnection
 - Electrical system upgrades
 - PV commissioning,
 - Project finalization.
- Various elements of the project would be constructed concurrently on the property. The Contractor would be responsible for scheduling and planning work phases and locations.
- Construction-related trip assumptions:
 - All trips to and from the site will access the site as shown in Figure 2.
 - The majority of the trips will originate from Barstow and Daggett, or from locations further away but utilizing major transportation routes, such as I-40 and I-15.
 - Trips leaving the project site will be reversing their arrival route.
 - The delivery of equipment and materials will follow the same route as described above, then distribute to the specific areas as needed. Site deliveries will take place throughout the day as needed by the Contractor.
 - Heavy equipment used for site development will stay on-site until work is completed. Fueling and minor repairs of heavy equipment will take place on-site.

- The delivery of equipment and materials will be using trucks. No air or rail services will be needed.
- Operations-related trips:
 - The project will have a minimal staff of 8 people working at the O&M building located at the corner of Sunray Lane and Silver Valley Road.
 - Operation activities may occur up to 24 hours a day, seven days a week.
 - Periodic module cleanings and quarterly maintenance activities will utilize 6 to 8 full-time workers for one to two weeks per quarter, or up to 40 cumulative days per year.
 - No heavy equipment would be used during normal project operation.
 - Operation and maintenance vehicles will include trucks (pickup, flatbed), forklifts, and loaders for routine and unscheduled maintenance, and water trucks for solar module washing.
 - Water for washing will be sourced from an on-site well.
 - Large heavy-haul transport equipment may be brought to the site infrequently for equipment repair or replacement.
- Decommissioning of the project will involve the same trips and trip characteristics as for project construction.

Existing Roadway Conditions

The following roadway segments were selected for review because of their proximity to the project:

1. Hidden Springs Road
2. Silver Valley Road
3. Powerline Road
4. Minneola Road
5. Wildhorse Road
6. Valley Center Road
7. Sunray Lane
8. Santa Fe Street
9. National Trails Highway

Methodology from the Highway Capacity Manual was applied for analyzing roadway segments near the project. This memorandum will assume the roadway type encountered at the site are major two-lane highways, with the following average daily volume thresholds:

- Level of Service (LOS) A – 1,200 vehicles
- LOS B – 2,900 vehicles

For example, the average daily volume at which LOS A becomes LOS B is 1,200 vehicles.

Table 1 summarizes the information collected by the Traffic Department of San Bernardino County, using their database of average daily traffic (ADT) counts. A range is shown if multiple locations along a designated roadway (but close to the project) were measured for ADT counts.

Table 1. Existing Roadway Conditions in the Project Area

Roadway	Volume (ADT)	LOS
Hidden Springs Road	485-892	A
Silver Valley Road	179	A
Powerline Road	No data	A (assumed)
Minneola Road	387-909	A
Wildhorse Road	21	A
Valley Center Road	64-708	A
Sunray Lane	No data	A (assumed)
Santa Fe Street	182	A
National Trails Highway	472	A

Source:

Grant Mann, San Bernardino County Public Works, Personal Communication,
June 28, 2018.

San Bernardino County, 2018, June 29. Average Daily Traffic Counts.
Available at <http://www.sbcounty.gov/dpw/trafficadt/AvgDailyTraffic.aspx>.

Project-Related Impacts

Construction traffic generated by this project will occur primarily as a result of construction workers traveling to and from the project's access points, as shown on Figure 2. Traffic will be generated by heavy equipment but once the vehicles are delivered to the site they will generally stay on the site and will not generate daily trips. Vehicle traffic will be generated by materials deliveries as well.

During construction, the project will generate a maximum of 600 additional round trips per day for construction workers traveling to and from the project's access points. The modeled construction phasing and operation phasing and ADT counts are shown in Appendix A. The ADT counts are for site activities that repeat daily, such as construction workers traveling to and from the site, and repeating material deliveries. Irregular or one-time deliveries to and from the project site, such as heavy equipment, will not have ADT counts.

Truck routes during construction will use the same routes as construction workers to access the site. Trucks will travel to the project's access points depending on construction activities occurring that day, as determined by the Contractor.

During operation, the project will generate a maximum of 8 additional round trips per day as operators of the project travel to and from the site. Periodic module cleanings and quarterly maintenance activities will utilize 6 to 8 full-time workers for one to two weeks per quarter, or up to 40 cumulative days per year.

Impacts due to Design Features

Project impacts will be to roads near the site as worker travel to and from the site. The heaviest use will be during construction activities, where up to 600 workers will travel to and from the site in addition to daily material deliveries. Up to 8 workers will continue to access the project's O&M building on a daily basis during operations.

Off-site improvements would consist of the following (see Figure 2):

- Hidden Springs Road, from where the paved road ends to the north of Santa Fe Street through the project area to the access points.
- Power Line Road, from Santa Fe Street to the access points.

Primary access points will be used by the Contractor for construction activities. The primary access points will remain during operation of the project, but access will be limited to maintenance, washing, repairs to solar panels, and other activities that will occur infrequently.

Construction Access Routes and Laydown Areas

Construction vehicles would access the project site from Interstates 40 and 15. During construction, materials would be placed within the project boundaries adjacent to the then-current phase of construction. To prevent theft and vandalism, materials would be secured within fenced areas. Storage containers may be used to house tools and other construction equipment. In addition, security guards would regularly monitor the site.

Impacts to Airports and Air Travel Resources

The project is adjacent to the Barstow-Daggett County Airport to the west, north, and east. The current layout for the project shows solar panels east and west of runway 8-26, and northeast of runway 4-22. All solar panels are located off airport property.

As described in the Airport Comprehensive Land Use Plan for the Barstow-Daggett Airport (Planning Department, San Bernardino County, May 1992) the airport establishes Civil Airport Imaginary Surfaces that guide height restrictions for development within airport approach and departure patterns. The project sits underneath the Civil Airport Imaginary Surfaces as outlined by the Airport Comprehensive Land Use Plan, as structures of the project will not exceed 150 feet in elevation.

The Applicant has met with Fort Irwin representatives and is following the Federal Aviation Administration (FAA) review and permit process. For the purposes of helicopter and airport safety, the Applicant is proposing to put marker balls on the gen-tie line near the airport. The Applicant will coordinate with Fort Irwin and the FAA to conform to safety standards. The Applicant is further coordinating with Fort Irwin and the FAA to comply with required safety measures.

As a result, the proposed project will not result in a change in air traffic patterns.

Impacts to Rail Transportation

The project is located north of an active Class I Burlington Northern and Santa Fe Railway (BNSF Railway) line running east-west between I-40 and Santa Fe Street. There is a crossing of this line on Hidden Springs Road. It appears to be a flat crossing with an active warning system (crossing guard) in each direction crossing the railroad tracks. No improvements are anticipated to the line or the crossing.

Project construction traffic will be crossing the BNSF Railway at this location. The Applicant will coordinate with BNSF Railway to schedule construction traffic with respect to train traffic to avoid impacts to the rail operations during construction and operations.

Impacts to Alternative Transportation

The project area and surrounding roads were evaluated to see if any impacts would take place to alternative transportation modes, including off-highway vehicles (OHV), walking, cycling, and mass transit.

There are no identified OHV areas on the project site or in the immediate area. Therefore, the project is not anticipated to impact OHV transportation.

All roads near the project are either single lane paved roads or existing dirt roads, with no bike trails or paths nearby. The project is not anticipated to impact cycling or walking activities.

Mass transit opportunities are limited in the project area. The Victor Valley Transit Authority identifies a Route 5 Dial-and-Ride service that operates seven days a week between Barstow and the unincorporated communities of Daggett, Newberry Springs, and town of Yermo. The route identifies the use of I-40, I-15, and the National Trails Highway/Route 66.

Impacts to this bus service are possible due to construction work at the project site, especially if service occurs during peak traffic times when construction workers are driving to and from the project. However, impacts should be temporary and limited to the immediate project vicinity. No impacts are predicted during operations of the project.

Congestion Management Program

The Congestion Management Program (CMP) prepared by the San Bernardino Association of Governments (June 2016 Update) was reviewed with respect to the proposed project. The CMP defines a network of state highways and arterials, level of service standards and related procedures and provides technical justification for the approach. The roadway network in the project area is characterized by free-flowing traffic conditions, and vehicles on the roadway generally travel unimpeded by others. Most project traffic impacts would occur during construction and therefore would be temporary in nature. Minimal additional traffic would occur during operations.

Mitigation

Construction traffic generated by this project has the potential to cause temporary impacts to transportation and traffic in the area. Due to the temporary nature of construction, these impacts will be short-lived. These impacts will be mitigated to a less-than-significant level with the development and implementation of a traffic mitigation plan as outlined in mitigation measure (MM) TR-1.

TR-1: Traffic Control Plan. Prepare and submit a Construction Traffic Control Plan in accordance with both the California Department of Transportation Manual on Uniform Traffic Control Devices and Work Area Traffic Control Handbook that will include:

- i. Timing the delivery of heavy equipment and building materials under the contractor's control during non-peak commute hours, to the extent feasible;
- ii. Directing construction traffic with a flag person;
- iii. Placing temporary signing, lighting, and traffic control devices if required, including, but not limited to, appropriate signage along access routes to indicate the presence of heavy vehicles and construction traffic;
- iv. Ensuring access for emergency vehicles to the project site;

- v. Temporarily closing travel lanes or delaying traffic during materials delivery, transmission line stringing activities, or any other utility connections;
- vi. Bicycle and pedestrian detour plans if/where applicable;
- vii. Maintaining access to adjacent property;
- viii. Specifying both construction-related vehicle travel and oversize load haul routes, minimizing construction traffic during the a.m. and p.m. peak hour, distributing construction traffic flow across alternative routes to access the project site in a way that maintains LOS conditions at the time of construction, and avoiding residential neighborhoods to the maximum extent feasible;
- ix. Traffic control plan coordination with the County, and potential traffic control plan adjustments, in the event of concurrent projects generating potentially overlapping traffic effects; and
- x. Additional traffic control plan coordination with Caltrans regarding the SR-58 Hinkley Expressway Project if construction of the proposed project occurs concurrently with construction of the expressway project.

Copies of the approved Construction Traffic Control Plan and all issued permits that may be necessary for construction such as (without limitation) work within roadway right-of-ways, the operation of oversized/overweight vehicles on San Bernardino County-maintained roads, and the use of a California Highway Patrol or pilot car escort shall be submitted to the San Bernardino County Public Works, Traffic Division; San Bernardino County Land Use Services, Land Development Division; San Bernardino County Land Use Services, Planning Division; and Caltrans.

FIGURES

Figure 1. Project Location

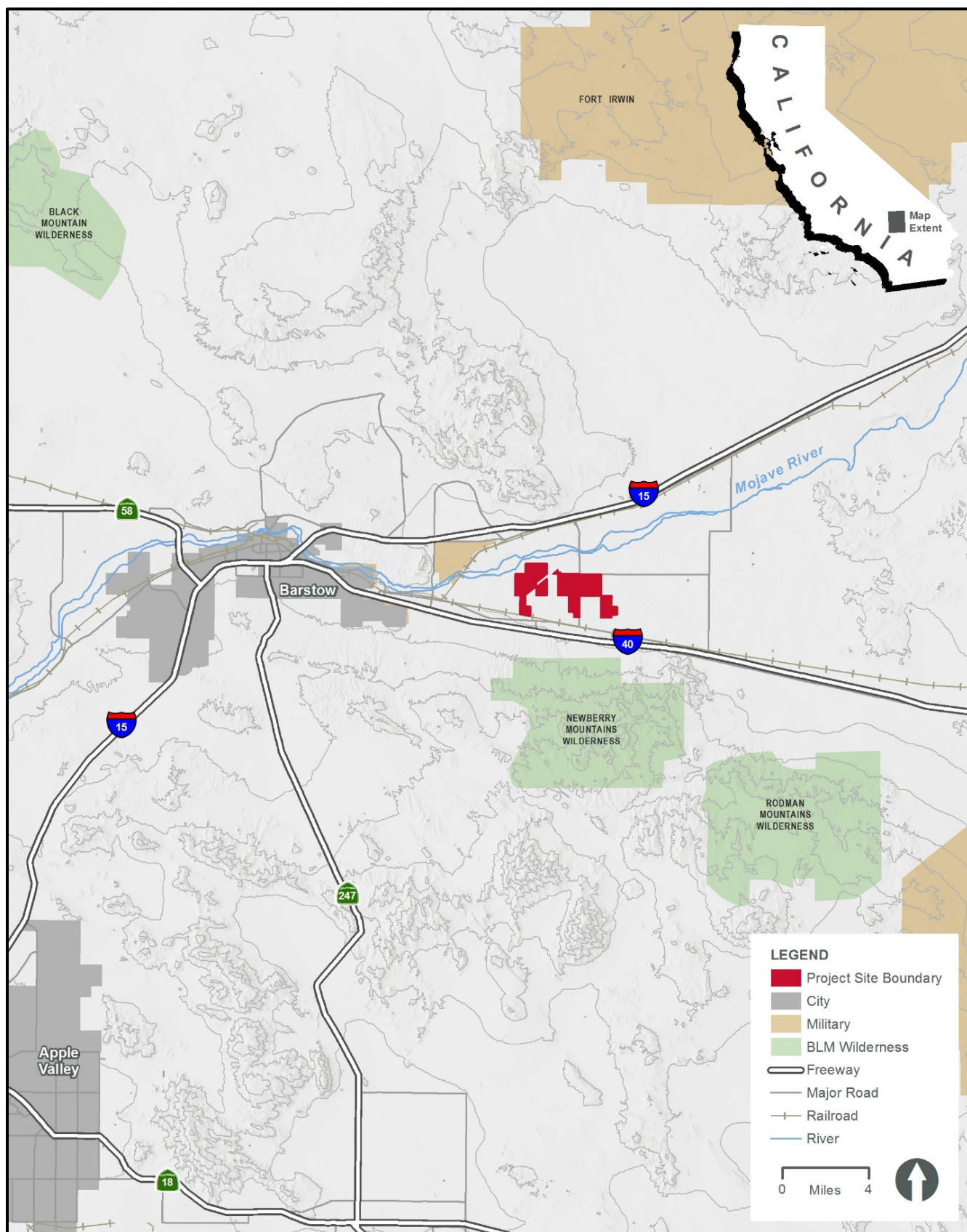
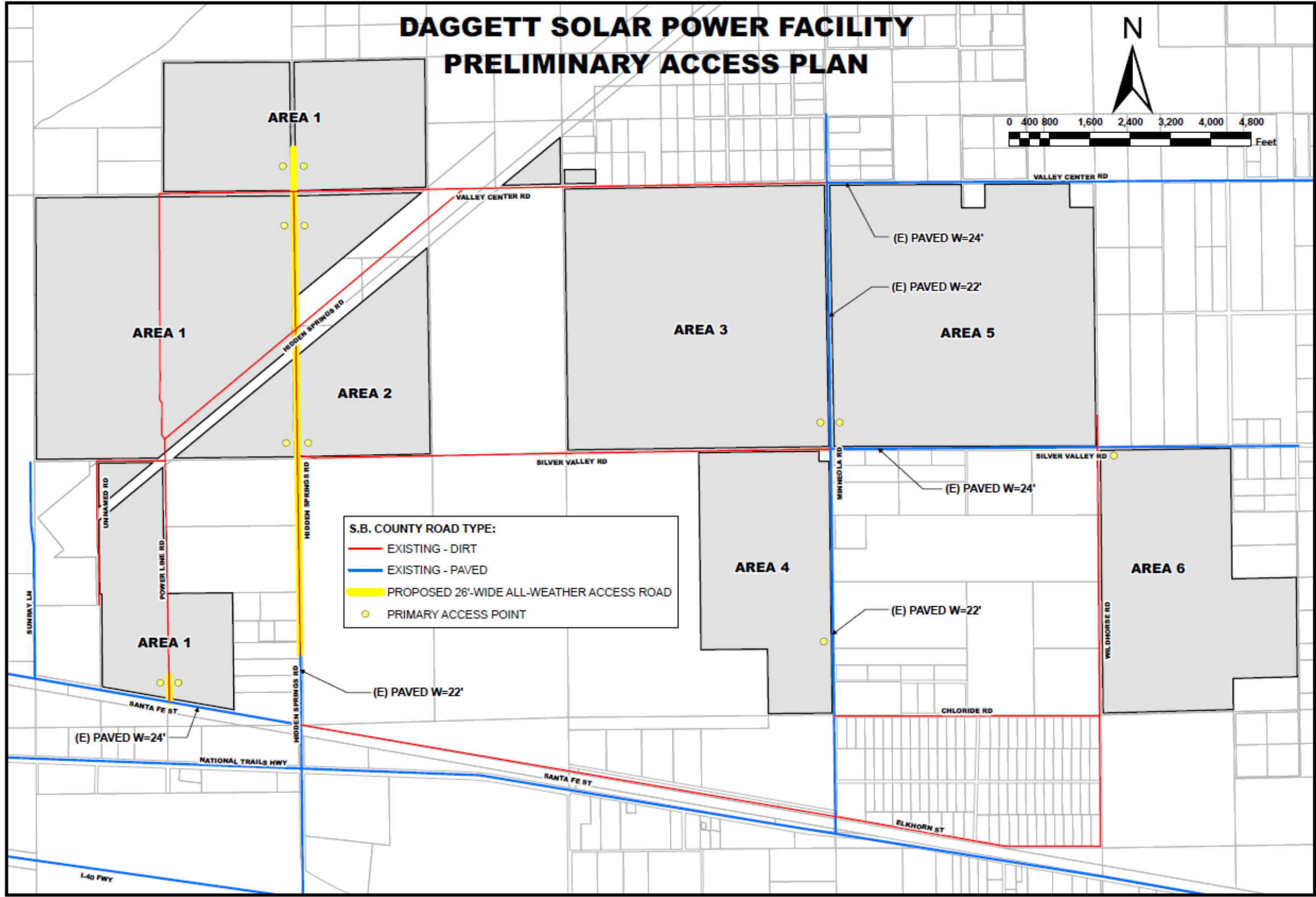


Figure 2. Preliminary Access Plan



APPENDIX A

Modeled Construction and Operation Phasing and Average Daily Traffic (ADT) Counts for the Daggett Solar Power Facility

Description	Location and Frequency (on-road or off-road)	Quantity (trips per day)	Type	ADT	AM Peak Hour		PM Peak Hour		Days	Total Trips	Percentage
					in	out	in	out			
Construction (Phases 1,2 and 3)											
Stage 1 - Preparation of Laydown Areas, construction of access roads, PV field preparation, substation site preparation, array foundation installation, conduit installation, relay house construction, perimeter fence installation											
Workers - employee commute	On-road	300	Passenger	752	376	0	0	376	452	339904	95.20%
Deliveries											
Modules and Racking	On-road, daily delivery	20	Large Truck	40	NA	NA	NA	NA	452	9040	2.53%
Gravel	On-road, daily delivery	16	Large Truck	16	NA	NA	NA	NA	452	7232	2.03%
Equipment delivery	On-road, one time	380	Large Truck	NA	NA	NA	NA	NA		380	0.11%
Water Truck delivery	On-road, one time	232	Large Truck	NA	NA	NA	NA	NA		232	0.06%
Light duty flat bed truck delivery	On-road, one time	52	Passenger	NA	NA	NA	NA	NA		52	0.01%
Water Truck removal	On-road, one time	192	Large Truck	NA	NA	NA	NA	NA		192	0.05%
TOTAL										357032	
Stage 2 - Solar panel array installation including pier supports and racking and tracking system, installation of conduit in trenches, wiring installed throughout system to inverter sites											
Workers - employee commute	On-road	250	Passenger	440	220	0	0	220	372	163680	91.58%
Deliveries											
Modules and Racking	On-road, daily delivery	20	Large Truck	20	NA	NA	NA	NA	372	7440	4.16%
Pickup Truck	On-road, daily delivery	20	Passenger	20	NA	NA	NA	NA	372	7440	4.16%
Light duty flat bed truck delivery	On-road, one time	348	Large Truck	NA	NA	NA	NA	NA		174	0.10%
TOTAL										178734	
Stage 3 - Inverter sites construction, substation installation cabling and terminations, gen-tie construction, array and interconnection commissioning, revegetation, construction waste removal and recycling											
Workers - employee commute	On-road	50	Passenger	320	160	0	0	160	300	96000	99.12%
Deliveries											
Equipment delivery	On-road, one time	32	Large Truck	NA	NA	NA	NA	NA	32	32	0.03%
Concrete delivery	On-road, one time	120	Large Truck	NA	NA	NA	NA	NA	120	120	0.12%
Demobilization	On-road, one time	704	Large Truck	NA	NA	NA	NA	NA	704	704	0.73%
TOTAL										96856	
Operation											
Daily O&M Workers - employee commute	On-road	8	Passenger	16	8	0	0	8	NA	NA	NA
Maintenance - employee commute	On-road, occasional (4 times/yr, 2 weeks per time)	40	Passenger	NA	NA	NA	NA	NA	NA	NA	NA
Array cleaning - employee commute	On-road, occasional (4 times/yr, 2 weeks per time)	40	Passenger	NA	NA	NA	NA	NA	NA	NA	NA

Notes: PCE - passenger car equivalent. A large truck has a PCE of 2. All other vehicles have a PCE of 1.