SECTION 3.0
AFFECTED ENVIRONMENT

3.1 INTRODUCTION

As required by the Council on Environmental Quality's (CEQ) regulation, the Bureau of Indian Affairs (BIA) National Environmental Policy Act (NEPA) manual, and 40 Code of Federal Regulations (CFR) Section 1502.15, this section describes the existing environment of the area affected by the project alternatives. Resource areas or issues that are described in this section include:

Section	Resource Area/Issue
3.2	Geology and Soils
3.3	Water Resources
3.4	Air Quality
3.5	Biological Resources
3.6	Cultural and Paleontological Resources
3.7	Socioeconomic Conditions
3.8	Transportation/Circulation
3.9	Land Use
3.10	Public Services
3.11	Noise
3.12	Hazardous Materials
3.13	Aesthetics

3.2 GEOLOGY AND SOILS

This section describes existing geological and soils conditions of the alternative sites described in **Section 2.2**. The general and site-specific profiles of geology and soils contained herein provide the environmental baseline by which direct, indirect, and cumulative environmental effects are identified and measured in **Section 4.2**, **Section 4.14**, and **Section 4.15**, respectively.

3.2.1 REGULATORY SETTING

State

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act; formerly the Alquist-Priolo Special Studies Zone Act), signed into law December 1972 after the 1971 San Fernando earthquake, requires the delineation of zones along active and potentially active faults in California. The California Geological Survey (CGS) defines an "active" fault as one that exhibits evidence of activity during the last 11,000 years. Faults that exhibit evidence of Quaternary activity (within the last 1.6 million years) are considered to be "potentially active." The purpose of the Alquist-Priolo Act is to regulate development on or near fault traces to reduce the hazard of fault rupture and to prohibit the location of most off-Reservation structures for human occupancy across these traces. Fault zones defined by the Alquist-Priolo Act are areas around active faults, averaging approximately one-quarter mile wide, within which cities and counties having jurisdiction must regulate certain development projects (DOC, 2016a).

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was enacted in 1990 to protect the public from the effects of strong ground shaking, liquefaction, landslides, ground failure, or other hazards caused by earthquakes. This act requires a state geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within the portions of those zones where they have jurisdiction. Before a development permit is granted by a city, county or other local permitting agency for a site within a seismic hazard zone, a geotechnical investigation must be conducted and appropriate mitigation measures must be incorporated into the project's design. Ground shaking probability maps have been developed in conjunction with the United States Geological Survey (USGS) for all of California (DOC, 2016b).

Surface Mining and Reclamation Act

The Surface Mining and Reclamation Act (SMARA) of 1975 requires all jurisdictions to incorporate mapped mineral resources designations approved by the California Mining and Geology Board within their general plans. SMARA was enacted to limit new development in areas with significant mineral deposits. The California Department of Conservation's Office of Mine Reclamation and the California Mining and Geology Board are jointly charged with ensuring proper administration of the act's

requirements. The California Mining and Geology Board circulates regulations to clarify and interpret the act's provisions and also serves as a policy and appeals board (DOC, 2016c).

Local

Shasta County General Plan

The Shasta County (County) General Plan is the guiding document for development in County . The County General Plan's Minerals section describes policies and goals regarding mineral and soil resources and identifies six aggregate minerals under production in the County, including: alluvial sand and gravel, crushed stone, volcanic cinders, limestone, diatomite, and gold (Shasta County, 2004). The County General Plan's Seismic and Geological Hazards section outlines seismic and geologic hazards in the County. Applicable geologic hazards include fault movement, ground shaking, and ground failure. Development on soils susceptible to seismic activity requires special permit review procedures and a geological investigation. Construction must meet reasonable standards for seismic resistance, site stability, grading, and geologic studies (Shasta County, 2004).

City of Redding General Plan

The City of Redding (City) General Plan, adopted in October, 2000, outlines growth and development goals within the City through the year 2020. Although the Strawberry Fields Site is located outside the incorporated boundaries of the City, it falls within the plan boundary area defined in Figure 1-1 of the City General Plan, and is therefore considered within the City's Sphere of Influence (SOI). The County General Plan's Health and Safety section identifies geologic hazards in the City such as seismically induced surface rupture, ground-shaking, ground failure, tsunami, seiche, dam failure, and slope instability leading to mudslides and landslides. The General Plan Natural Resources Element outlines goals and polices regarding mineral and soil resources in the City and identifies copper, gold, tungsten, and gravel as the primary mineral deposits mined within the City (City of Redding, 2000).

City of Anderson General Plan

Anderson's General Plan was approved in 2007 with a stated purpose to plan for needed growth while protecting the "small town" feel of Anderson. The Health and Safety Element identifies geologic hazards in the City of Anderson such as seismically induced surface rupture, ground-shaking, tsunami, seiche, dam failure, mudslides, landslides, subsidence, and liquefaction. The General Plan Conservation Element outlines goals and polices regarding mineral and soil resources and states that there is little mining in the City Anderson (City of Anderson, 2007).

3.2.2 ENVIRONMENTAL SETTING

Strawberry Fields Site

Geological Setting

The Strawberry Fields Site is situated at the northern end of the Great Valley Geomorphic Province (Great Valley), a relatively flat alluvial plain, about 50 miles wide and 400 miles long. The alluvium is comprised of thick sequences of sedimentary deposits from the Jurassic through Holocene ages. The Great Valley is bounded on the north by the Klamath and Cascade mountain ranges, on the east by the Sierra Nevada Mountains and on the west by the California Coast Mountain Range, and is drained by the Sacramento and San Joaquin Rivers (DOC, 2015). Although the Valley is largely filled with alluvial deposits, there are groundwater basins in both alluvium and hard rock features (Shasta County, 2004). Surface elevations in the Valley generally range from 400 feet above mean sea level (amsl) to 700 feet amsl.

Site Topography

The Strawberry Fields Site is situated on a relatively level terrace above the Sacramento River. Overall, Strawberry Fields slopes gently downward to the south, though the lowest point lies near the center. The western site boundary is an almost vertical embankment above the Sacramento River; on-site elevations range from approximately 440 to 454 feet amsl.

Soils

The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) aggregates soil survey and mapping data. Each survey maps soil units and provides a summary of major physical characteristics for each unit with management recommendations. The soil survey map of the Strawberry Fields Site is shown in **Figure 3.2-1**. A brief description of each soil unit and approximate percentages are provided below. **Table 3.2-1** outlines soil characteristics that pertain to stormwater runoff and erosion potential (NRCS, 2017).

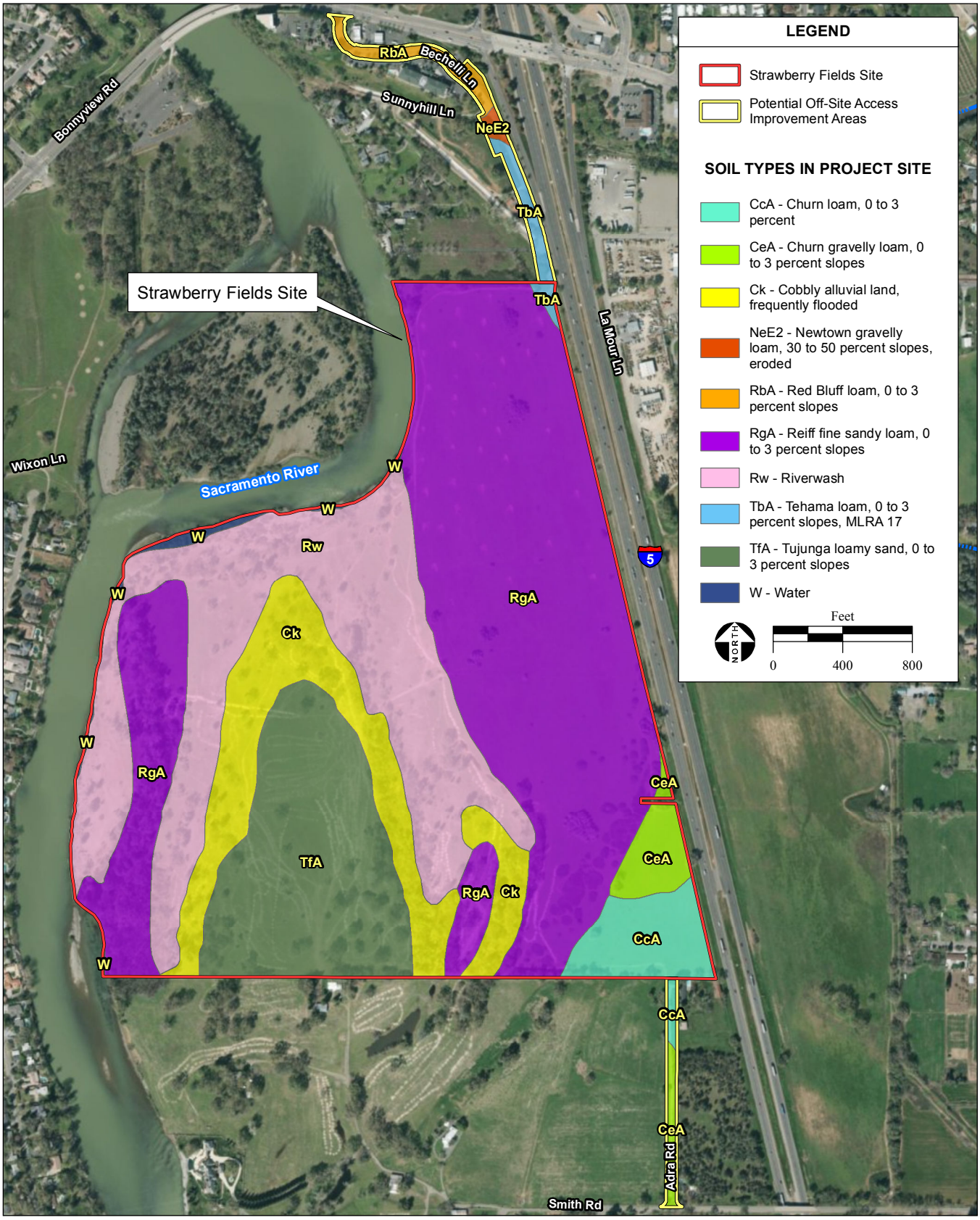
Soil Types

Reiff fine sandy loam

This well drained, nearly level soil is often located in floodplains and is characterized by slopes ranging from 0 to 3 percent in elevations ranging from 30 to 500 feet amsl. It forms within alluvium, and has a fine sandy loam surface layer approximately 18 inches thick underlain by stratified sandy loam to a depth of 60 inches. This soil makes up approximately 44.3 percent of Strawberry Fields Site and is located primarily in the eastern portion of the site (NRCS, 2017).

Riverwash

This excessively drained soil is typically located in drainage ways at elevations ranging from 700 to 2,900 feet amsl. It is formed in gravelly alluvium and consists of very gravelly sand to a depth of 60 inches.



SOURCE: USDA NRCS SSURGO Soil Survey for Shasta County, 9/12/2016; USDA aerial photograph, 7/26/2014; ESRI Data, 2016; AES, 7/18/2018

Figure 3.2-1
Soil Types - Strawberry Fields Site

This soil makes up approximately 23.9 percent of the Strawberry Fields Site and is located primarily near the bend in the Sacramento River (NRCS, 2017).

TABLE 3.2-1
STRAWBERRY FIELDS SITE SOIL PROPERTIES

Soil	Percent of Site	Hydrologic Soil Group	Drainage Class	Saturated Hydraulic Conductivity (Ksat, in/hr)	Erosion Susceptibility	Corrosion of Concrete	Corrosion of Steel	Linear Extensibility
Reiff fine sandy loam	44.3	A	Well Drained	28.00	Slight	Moderate	High	Low
Riverwash	23.9	N/A	Excessively Drained	92.00	N/A	N/A	N/A	Low
Tujunga loamy sand	14.1	A	Somewhat Excessively Drained	92.00	Slight	Moderate	High	Low
Cobbly alluvial land	11.2	N/A	Excessively Drained	92.00	N/A	N/A	N/A	Low
Churn loam	3.6	C	Well Drained	6.17	Slight	Moderate	Moderate	Low
Churn gravelly loam	2.2	C	Well Drained	6.17	Slight	Moderate	Moderate	Low
Water	0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tehama loam	0.3	C	Well Drained	4.40	Slight	Moderate	Low	Low

Source: NRCS, 2017.

Tujunga loamy sand

This somewhat excessively drained, nearly level soil is typically located in floodplains characterized by slopes ranging from 0 to 3 percent. It is generally found at elevations ranging from 10 to 2,500 feet amsl and forms in sandy alluvium. The loamy sand surface layer is approximately 27 inches thick with stratified very gravelly sand to a depth of 60 inches. This soil makes up approximately 14.1 percent of the Strawberry Fields Site and is located in the center of the eastern side (NRCS, 2017).

Cobbly alluvial land

This excessively drained soil is generally found on shoulders and summits over a wide range of elevations (20 to 2,400 feet amsl). It forms in alluvium and can be up to 60 inches deep in the vicinity. This cobbly alluvial deposit is located on the western portion of the Strawberry Fields Site, close to the Sacramento River, and accounts for approximately 11.2 percent of site soils (NRCS, 2017).

Churn loam

This well drained, nearly level soil is typically located on landforms with slopes ranging from 0 to 3 percent at elevations ranging from 400 to 800 feet amsl. Churn loam is formed in alluvium and is

typically up to 60 inches deep. This soil, located in the southeast corner of the Strawberry Fields Site, comprises approximately 3.6 percent of site soils (NRCS, 2017).

Churn gravelly loam

Churn gravelly loam is a well-drained soil typically located on landforms with slopes ranging from 0 to 3 percent at 400 to 800 feet amsl. Churn gravelly loam also forms in alluvium and can be up to 60 inches deep. Churn gravelly loam, located in the southeast corner of Strawberry Fields, comprises approximately 2.2 percent of site soils (NRCS, 2017).

Tehama loam

This well drained, nearly level soil is typically located in stream terraces characterized by slopes ranging from 0 to 3 percent. It is typically found at elevations ranging from 60 to 2,160 feet amsl and forms in fine silty alluvium derived from sedimentary rock. This soil makes up approximately 0.3 percent of the Strawberry Fields Site and is located in the northeastern corner (NRCS, 2017).

Soil Hazards

The hydrologic soil group is a classification based on the runoff potential of the soils when thoroughly saturated by a long duration storm. Soils are grouped into four classes grading from A to D, with A being coarse-grained soils with high infiltration and low runoff potential, and D being mostly fine-grained clays with extremely slow infiltration and high runoff potential. The soils on the Strawberry Fields Site have hydrologic ratings of both A (58.4 percent) and C (6.1 percent), indicating that the majority of the soils are relatively course-grained with low runoff potential with some finer-grained soils along the western edges (**Table 3.2-1**, USDA, 2007).

Drainage class is a measure of the frequency and duration of wet periods under conditions similar to those in which the soil developed. In well-drained to excessively drained soils, such as those present on the Strawberry Fields Site (**Table 3.2-1**), water quickly drains from the soil (NRCS, 2017).

Saturated hydraulic conductivity is a quantitative measurement of the movement of water through saturated soil, or the ease with which pores in a saturated soil transmit water, abbreviated as "Ksat." Ksat is a factor in determining the hydrologic soil group, and is often used in the design of water and wastewater disposal features such as percolation ponds and septic systems. Ksat measures transport only in a vertical direction under completely saturated conditions. It is considered an inherent property irrespective of a soil's native surroundings, and does not account for site-specific variations such as confining layers, degree of saturation, or topography. The following descriptions for the range of measured Ksat are used by the NRCS (NRCS, 2017):

- Very High > 100 µm/s
- High 10 - 100 µm/s

- Moderately High 1 - 10 μm/s
- Moderately Low 0.1 - 1 μm/s
- Low 0.01 - 0.1 μm/s
- Very Low < 0.01 μm/s

As shown in **Table 3.2-1**, 93.5 percent of the Strawberry Fields Site's soils transmit water at a high rate, however the flat topography indicates a low potential for erosion.

Corrosivity pertains to a soil-induced electrochemical or chemical action that corrodes concrete or steel. Table 3.2-1 shows that all of the soils within the Strawberry Fields Site have a moderate risk of corrosion to concrete but vary in corrosivity to steel; Tehama loam has a low risk of corrosion to steel while the Churn loam and Churn gravelly loam both have a moderate corrosivity to steel. Reiff fine sandy loam and Tujunga loamy sand, which encompass the majority of the site, are highly corrosive to steel (NRCS, 2017).

Expansive soils are largely comprised of clays, which may increase in volume when water is absorbed and shrink when dried; this property is measured using linear extensibility. Expansive soils are of concern because they can cause building foundations to rise during the rainy season and fall during the dry season, causing structural distortion. As shown in **Table 3.2-1**, soils within the Strawberry Fields Site have a low linear extensibility, and thus a low shrunk-swell potential (NRCS, 2017).

Seismicity

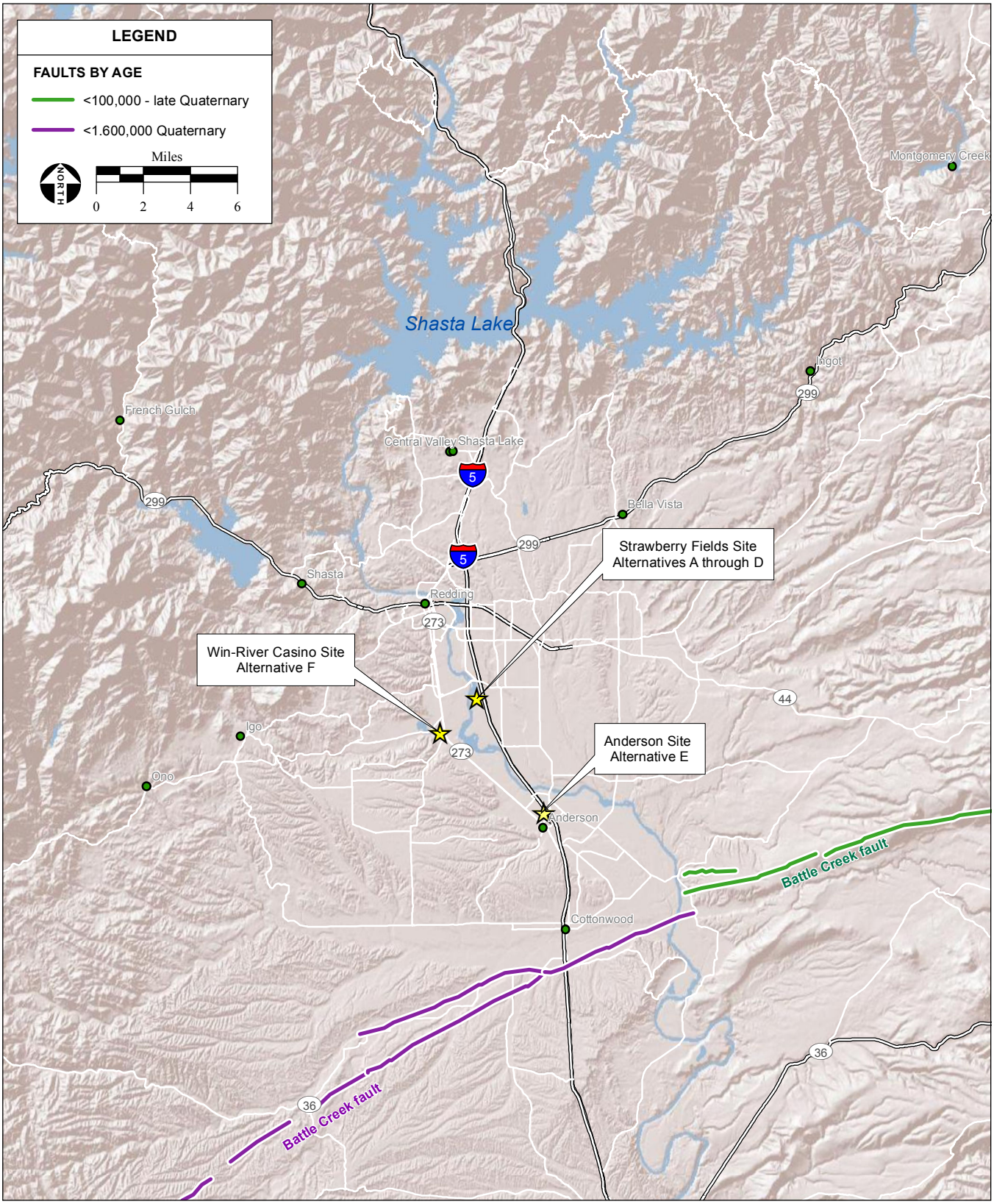
Seismic Conditions

The County is a seismically active region, although seismic events have not presented a serious hazard in the County's history (Shasta County, 2004). As shown in **Figure 3.2-2**, the nearest fault line is Battle Creek Fault, approximately 11 miles south of the Strawberry Fields Site. The fault dates to the Quaternary period, indicating that the Battle Creek Fault is potentially active.

Liquefaction

Soil liquefaction can occur in seismic conditions. Liquefaction is the temporary transformation of saturated, non-cohesive material from a relatively stable, solid condition to a liquefied state as a result of increased soil pore water pressure. Soil pore water pressure is the water pressure between soil particles. Liquefaction can occur if three factors are present: seismic activity, loose sand or silt, and shallow groundwater.

The County General Plan identifies areas of moderate risk for liquefaction, while the City General Plan identifies some areas along the Sacramento River and tributaries as having high potential for liquefaction (Shasta County, 2004). The Strawberry Fields Site is located along the Sacramento River and is therefore in a region identified by the City as having high liquefaction potential (City of Redding, 2000). However,



SOURCE: USGS Earthquake Hazards Program, 7/26/2010;
California Geological Survey, 2005; AES, 8/11/2017

Figure 3.2-2
Regional Fault Map

the specific soils identified within the Strawberry Fields Site are not types which pose a risk for liquefaction (NRCS, 2017).

Lateral Spreading

Lateral spreading is a type of ground failure that typically occurs during a seismic event in the form of horizontal ground displacement. It is typical where soils are deep and soft and the ground surface is relatively flat and comprised of alluvium or depositional sediment. This movement in soils is generally due to failure along a weak sub-layer that is formed within an underlying liquefied layer. Cracks develop within the weakened material, while blocks of soil move laterally toward the free face, resembling a flowing liquid.

The Strawberry Fields Site is generally flat and composed of depositional soil types, which are typical features that can lead to lateral spreading. However, due to the well-drained soils and low linear extensibility within the Strawberry Fields Site, it is unlikely that lateral spreading would occur.

Volcanic Hazard

Volcanic hazards include tephra falls, lahar or debris flows, pyroclastic flows and surges, lateral blasts, and debris avalanches (Sherrod and Smith, 1995). Tephra is produced during volcanic activity, and can include dust, ash, cinders, pumice, and blocks (Blake et al., 2008). Tephra falls present a great hazard even for distant communities surrounding active volcanoes, as the material can travel up to 225 miles per hour and be carried more than 5 miles from the volcano. Lahar, also called mudflows or debris flows, are landslides consisting of pyroclastic material travelling down the slopes of a volcano, and the deposits these slides produce (Blake et al., 2008). Lahar present the greatest hazard from volcanism because they travel farther than any other hazards with the exception of airborne tephra, and affect river valley communities where extensive human development often occurs (Sherrod and Smith, 1995).

The Strawberry Fields Site is approximately 44 miles west of Lassen Peak, 57 miles south of Mount Shasta, and approximately 81 miles southwest of Medicine Lake volcano. Lassen Peak is a stratovolcano which last erupted in 1915 and has a very high threat potential. Mount Shasta, also a stratovolcano, last erupted 200 to 300 years ago. On average, Mount Shasta eruptions occur every 600 to 800 years, and therefore has a high threat potential. Additionally, Medicine Lake, a composite volcano, has erupted nine times over the last 5,200 years and is considered to have a high threat potential as well (USGS, 2014). Due to the proximity to three major volcanic hazards (within 100 miles), there is the possibility for volcanic hazards on the site.

Mineral Resources

The County General Plan identifies aggregate minerals such as alluvial sand and gravel, crushed stone, volcanic cinders, limestone, diatomite, and gold as mineral resources within the county (Shasta County,

2004). However, none of the mineral resource zones identified in the County or City General Plan occur within the Strawberry Fields Site (USGS, 2017).

Off-site Access Improvement Areas

Geological Setting

The Off-site Access Improvement Areas are located both north and south of the Strawberry Fields Site. The Off-site Access Improvement Areas both lie within the Great Valley, as described under for the Strawberry Fields Site. A description of the regional geological setting is provided above.

Site Topography

The Off-site Access Improvement Areas are situated on a relatively level terrace above the Sacramento River. Overall, both the North and South Access Improvement Areas slope gently upwards away from the Strawberry Fields Site, with elevations ranging from 450 to 520 feet amsl.

Soils

The USDA NRCS soil survey map of the Off-site Access Improvement Areas is shown above in **Figure 3.2-1**. As shown in the figure, the Off-site Access Improvement Areas are composed of Red bluff loam, Tehama loam, Churn gravelly loam, Churn loam, and Newton gravelly loam. A brief description of each soil unit and approximate site percentages are provided below. **Table 3.2-2** outlines soil characteristics that pertain to stormwater runoff and erosion potential (NRCS, 2017).

TABLE 3.2-2
OFF-SITE ACCESS IMPROVEMENT AREAS SOIL PROPERTIES

Soil	Percent of Site	Hydrologic Soil Group	Drainage Class	Saturated Hydraulic Conductivity (Ksat, in/hr)	Erosion Susceptibility	Corrosion of Concrete	Corrosion of Steel	Linear Extensibility
Red bluff loam	35.8	C	Well Drained	0.20	Slight	Moderate	Moderate	Low
Tehama loam	26.7	C	Well Drained	4.40	Slight	Moderate	Low	Low
Churn gravelly loam	21.1	C	Well Drained	6.17	Slight	Moderate	High	Low
Churn loam	8.5	C	Well Drained	6.17	Slight	Moderate	Moderate	Low
Newton gravelly loam	7.6	C	Well Drained	0.20	Severe	Moderate	Moderate	Low

Source: NRCS, 2016a.

Red bluff loam

This well drained, nearly level soil is typically located on terraces with slopes ranging from 0 to 3 percent at elevations ranging from 75 to 1,500 feet amsl. Red bluff loam is formed in alluvium and typically is

very deep. This soil, located on the northern portion of the North Access Improvement Area, comprises approximately 35.8 percent of the site's soils (USDA, 1986).

Tehama loam

This soil, located on the southern portion of the North Access Improvement Area, comprises approximately 26.7 percent of the site's soils. A brief description of the soil is provided above.

Churn gravelly loam

This soil, located on the southern portion of the South Access Improvement Area, comprises approximately 21.1 percent of the site's soils. A brief description of the soil is provided above.

Churn loam

This soil, located on the northern portion of the South Access Improvement Area, comprises approximately 8.5 percent of the site's soils. A brief description of the soil is provided above.

Newton gravelly loam

This very poorly drained soil, typically has slopes ranging from 30 to 50 percent at elevations of approximately 700 feet amsl. Newton gravelly loam is generally formed in sandy sediments on outwash or lake plains. This soil, located on the central portion of the North Access Improvement Area, comprises approximately 7.6 percent of the site's soils (USDA, 2012).

Seismicity

Similar to the Strawberry Fields Site, the nearest fault line is Battle Creek Fault, approximately 11 miles south of the Off-site Access Improvement Areas, as shown in **Figure 3.2-2**.

Volcanic Hazard

Similar to the Strawberry Fields Site, the nearest volcano is Lassen Peak, approximately 44 miles east of the Off-site Access Improvement Areas.

Mineral Resources

Similar to the Strawberry Fields Site, none of the mineral resource zones identified in the County or City General Plans occur within the Strawberry Fields Site (USGS, 2017).

Anderson Site

Geological Setting

The Anderson Site is located approximately 4.75 miles southeast of the Strawberry Fields Site in the City of Anderson. Similar to the Strawberry Fields Site, the Anderson Site lies within the Great Valley

Geomorphic Province and its geological setting is similar to that found on the Strawberry Fields Site. The regional geological setting is described in detail above.

Site Topography

The Anderson Site lies on level terrain with elevations ranging from approximately 413 to 417 feet amsl.

Soils

The USDA NRCS soil survey map of the Anderson Site is shown above in **Figure 3.2-3**. A brief description of each soil unit mapped on the Anderson Site and estimated site percentages are listed below. Additionally, a brief description of Churn gravelly loam, located in the southeast corner of the property and comprises approximately 2.0 percent of the site's soils, is provided above. **Table 3.2-3** outlines soil characteristics that pertain to stormwater runoff and erosion potential (NRCS, 2017).

TABLE 3.2-3
ANDERSON SITE SOIL PROPERTIES

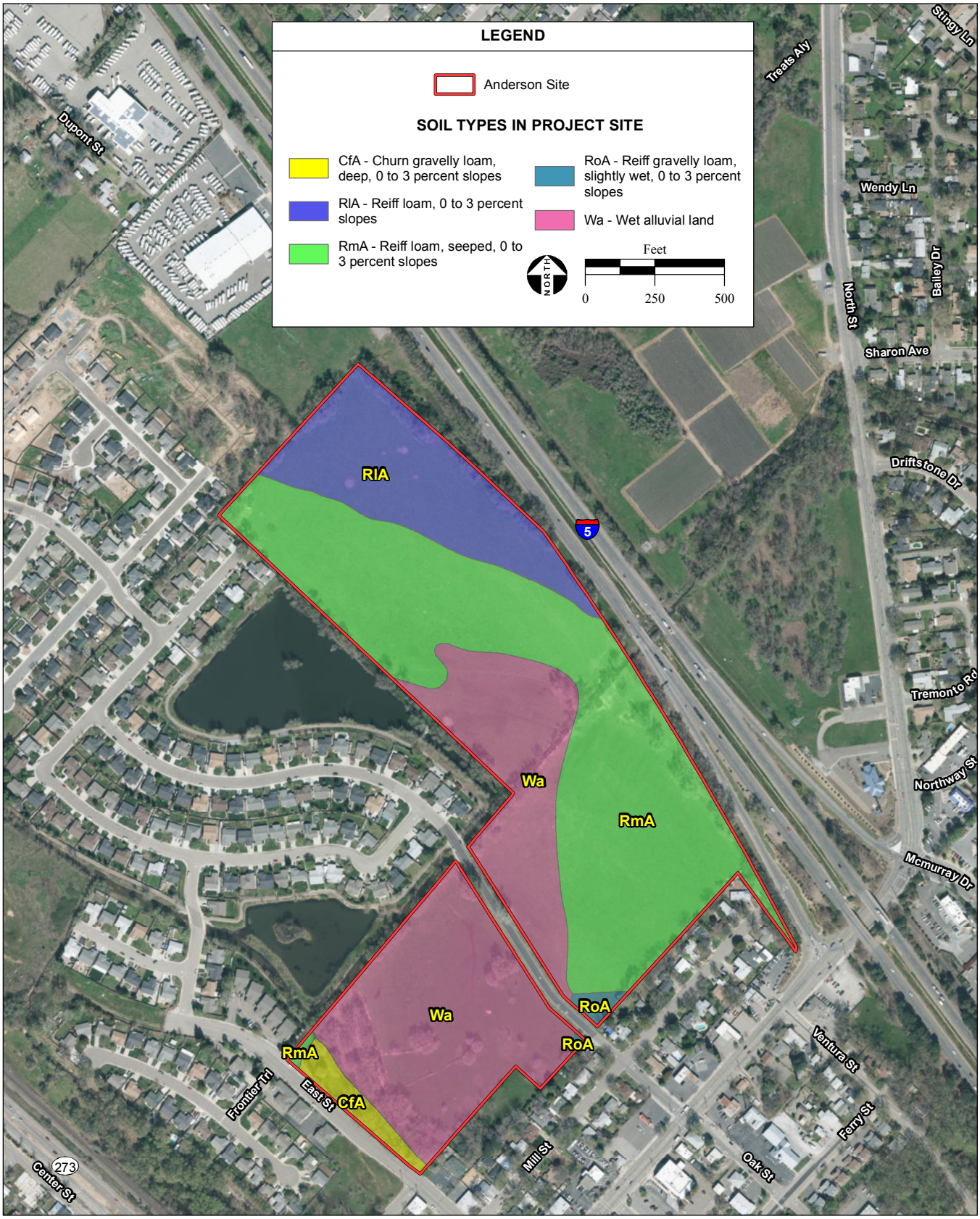
Soil	Percent of Site	Hydrologic Soil Group	Drainage Class	Saturated Hydraulic Conductivity (Ksat, in/hr)	Erosion Susceptibility	Corrosion of Concrete	Corrosion of Steel	Linear Extensibility
Reiff loam, seeped	43.4	A/D	Moderately Well Drained	28.00	Slight	Low	High	Low
Wet alluvial land	41.0	N/A	Somewhat Poorly Drained	2.7	N/A	N/A	N/A	Moderate
Reiff loam	12.3	A	Well Drained	28.00	Slight	Low	Low	Low
Churn gravelly loam	2.0	C	Well Drained	6.17	Slight	Moderate	High	Low
Reiff gravelly loam	1.4	A/D	Moderately Well Drained	28.00	Slight	Low	High	Low
Source: NRCS, 2016a.								

Reiff loam, seeped

This moderately well drained, nearly level soil is typically located in floodplains on slopes ranging from 0 to 3 percent. This soil forms in alluvium at elevations ranging from 30 to 1,500 feet amsl. This soil makes up approximately 43.4 percent of the Anderson Site and is located in both the northeastern and southwest corners of the property (NRCS, 2016a).

Wet alluvial land

This somewhat poorly drained soil is typically located in floodplains. It forms in alluvium at elevations ranging from 200 to 800 feet amsl. This soil makes up approximately 41.0 percent of the Anderson Site and is located on the southwest side of the property (NRCS, 2016a).



SOURCE: USDA NRCS SSURGO Soil Survey for Shasta County, 9/12/2016;
USDA aerial photograph, 7/26/2014; ESRI Data, 2016; AES, 7/18/2018

Figure 3.2-3
Soil Types - Anderson Site

Reiff loam

This well drained, nearly level soil is typically located in floodplains and characterized by slopes ranging from 0 to 3 percent. It formed in alluvium and is typically found at elevations ranging from 30 to 500 feet amsl. This soil makes up approximately 12.3 percent of the Anderson Site and is found in the northeast corner (NRCS, 2016a).

Reiff gravelly loam

This moderately well drained, nearly level soil is typically located in floodplains on slopes ranging from 0 to 3 percent. Reiff gravelly loam forms in alluvium and is typically found at elevations ranging from 30 to 1,500 feet amsl. This soil makes up approximately 1.4 percent of the Anderson Site near the eastern boundary (NRCS, 2016a).

Soil Hazards

The soils on the Anderson Site have hydrologic ratings of A, C, and D, indicating that the majority of the soils are relatively course-grained with low runoff potential mixed with finer-grained soils along the western edge (**Table 3.2-3**, USDA, 2007).

As shown in **Table 3.2-3**, the majority of the Anderson Site consists of well-drained soils, meaning water is rapidly removed from the soil. However, 41 percent of the site contains somewhat poorly drained soils, which remain wet for significant periods of time (NRCS, 2016a). **Table 3.2-3** indicates that most Anderson Site soils transmit water at a high (Ksat) rate, however the low topographic relief on site indicates a low potential for erosion.

Table 3.2-3 shows that all of the soils within the Anderson Site have a low to moderate risk of corrosion to concrete but vary in corrosivity to steel. The Reiff loam has a low risk of corrosion to steel while the remaining soils are highly corrosive to steel (NRCS, 2016a). As shown in **Table 3.2-3**, wet alluvial land has moderate linear extensibility, while the remaining soils have a low linear extensibility (NRCS, 2016a).

Seismicity

Similar to the Strawberry Fields Site, the nearest fault line is Battle Creek Fault, approximately six miles south of the Anderson Site (**Figure 3.2-2**). Refer to the description of seismic hazards above.

Liquefaction

The Anderson Site is not an area of high liquefaction potential, as identified by the County General Plan (Shasta County, 2004). Additionally, the soils identified within the Anderson Site, discussed above, do not pose a risk for liquefaction as there is no loose sand or silty soil on the site (NRCS, 2016a).

Lateral Spreading

Similar to the Strawberry Fields Site, the Anderson Site is generally flat and composed of alluvial soil types, which are typical features that can lead to lateral spreading. However, due to the well-drained soils and low linear extensibility within the Anderson Site, it is unlikely that lateral spreading would occur.

Volcanic Hazard

Similar to the Strawberry Fields Site, the nearest volcano is Lassen Peak, approximately 41 miles east of the Off-site Access Improvement Areas.

Mineral Resources

None of the mineral resource zones identified in the County and City of Anderson General Plans occur within the Anderson Site (USGS, 2017).

Win-River Casino Site

Geological Setting

The Win-River Casino Site is located approximately 2.3 miles southwest of the Strawberry Fields Site. Similar to the Strawberry Fields Site, the Win-River Casino Site lies within the Great Valley Geomorphic Province and its geological setting is similar to that found on the Strawberry Fields Site. The regional geological setting is described in detail above.

Site Topography

The Win-River Casino Site lies on level terrain with an elevation ranging from approximately 464 to 470 feet amsl. There is a steep cliff between the existing Win-River Casino and the Sacramento River, which flows directly north of the site.

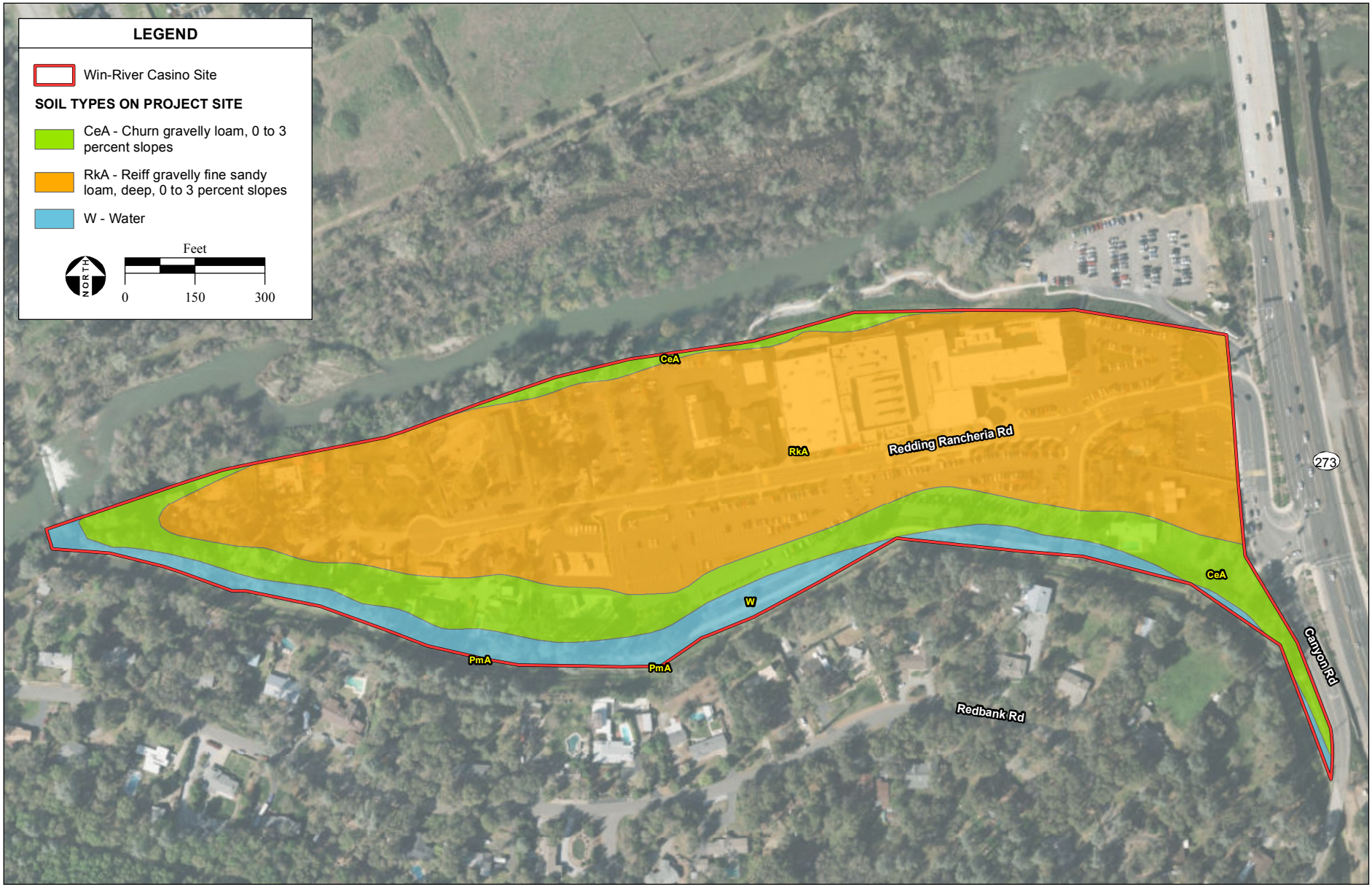
Soils

The USDA NRCS soil survey map of the Win-River Casino Site is shown above in **Figure 3.2-4**. A brief description of each soil unit mapped on the Win-River Casino Site and estimated site percentages are presented below. **Table 3.2-4** show soil characteristics for the Win-River Casino Site which pertain to the creation of runoff and the potential for erosion, both of which are pertinent to development land uses where ground disturbing activities will occur.

Soil Types

Reiff gravelly fine sandy loam

This well drained, nearly level soil is typically located in floodplains on low slopes ranging from 0 to 3 percent. It forms in alluvium at elevations ranging from 30 to 1,500 feet amsl. This soil makes up



SOURCE: USDA NRCS SSURGO Soil Survey for Shasta County, 9/12/2016; City of Redding SRTA aerial photograph, 3/17/2016; AES, 7/18/2018

Figure 3.2-4

Soil Types - Win-River Casino Site

approximately 64.1 percent of the Win-River Casino Site and is located in the central portion of the site (NRCS, 2016b).

TABLE 3.2-4
WIN-RIVER CASINO SITE SOIL PROPERTIES

Soil	Percent of Site	Hydrologic Soil Group	Drainage Class	Saturated Hydraulic Conductivity (Ksat, in/hr)	Erosion Susceptibility	Corrosion of Concrete	Corrosion of Steel	Linear Extensibility
Churn gravelly loam	27.8	C	Well Drained	9.00	Slight	Moderate	Moderate	Low
Reiff gravelly fine sandy loam	64.1	C	Well Drained	28.00	Slight	Moderate	High	Low
Water	8.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: NRCS, 2016b.

Churn gravelly loam

Churn gravelly loam is located in the southeast corner of the property and comprises approximately 27.8 percent of site soils (NRCS, 2017). A brief description of the soil is provided above.

Soil Hazards

The soils on the Win-River Casino Site have hydrologic rating of C, indicating finer-grained soils with a higher runoff potential but also a rapid drainage pattern (**Table 3.2-4**; USDA, 2007). Table 3.2-4 indicates that most Win-River Casino Site soils transmit water at a high (Ksat) rate; however, the low topographic relief on site indicates a low potential for erosion.

Table 3.2-4 shows that all of the soils within the Win-River Casino Site have a moderate risk of corrosion to concrete but vary in corrosivity to steel. Churn gravelly loam has a moderate risk of corrosion to steel while Reiff gravelly fine sandy loam soils are highly corrosive to steel (NRCS, 2016b). All the soils within the Win-River Casino Site have low linear extensibility, indicating a low shrink-swell potential (NRCS, 2016b).

Seismicity

Similar to the Strawberry Fields Site, the nearest fault line is Battle Creek Fault, approximately 13 miles south of the Win-River Casino Site (**Figure 3.2-2**). Refer to the description of seismic hazards above.

Liquefaction

As identified in the County General Plan, the Win-River Casino Site is located within an area of high liquefaction potential, however, the individual soils identified within the Win-River Casino Site do not pose a risk for liquefaction as there is no loose sand or silty soil on the site (Shasta County, 2004).

Lateral Spreading

Similar to the Strawberry Fields Site, the Win-River Casino Site is generally flat, which can typically lead to lateral spreading. However, due to the well-drained soils and low linear extensibility within the Win-River Casino Site, it is unlikely that lateral spreading would occur.

Volcanic Hazard

Similar to the Strawberry Fields Site, the nearest volcano is Lassen Peak, approximately 46 miles east of the Off-site Access Improvement Areas.

Mineral Resources

No identified mineral resources (i.e., gravel and/or sand) are present within the Win-River Casino Site boundaries (USGS, 2017).

3.3 WATER RESOURCES

This section provides a description of surface water and groundwater features including watersheds, drainage, flooding, and water quality in the vicinity of the alternative sites. Water resources designated as Waters of the U.S. are discussed in **Section 3.5**, **Biological Resources**. **Section 3.10**, **Public Services**, describes existing water supply facilities and regulatory requirements for wastewater treatment and disposal. The general and site-specific profiles of water resources contained herein provide the environmental baseline by which direct, indirect, and cumulative environmental effects are identified and measured in **Section 4.3**, **Section 4.14**, and **Section 4.15**, respectively.

3.3.1 REGULATORY SETTING

Floodplain

Executive Order (EO) 11988 requires that federal agencies evaluate the potential effects of any actions they may take in a floodplain. Specifically, EO 11988 states that agencies shall first determine whether the proposed action will occur in a floodplain. EO 11988 defines a floodplain as an area that has a one percent or greater chance of flooding in any given year. Second, if an agency proposes to allow an action to be located in a floodplain, "the agency shall consider alternatives to avoid adverse effects and incompatible development in the floodplains."

As discussed in greater detail in **Section 3.3.2**, portions of the Strawberry Fields, Anderson, and Win-River Casino Sites are located within the 1.0 percent annual chance (100-year) and 0.2 percent annual chance (500 year) flood areas.

The Federal Emergency Management Agency (FEMA) does not have setback guidelines from river channels and there are no special building requirements for structures located outside the designated 100-year floodplain. If there is an encroachment on the 100-year floodplain, then FEMA has specific requirements that must be followed.

Surface Water

Clean Water Act (CWA)

The federal Clean Water Act (CWA), 33 United States Code (USC) Section 1251(a)(2), sets forth national goals that waters shall be "fishable, swimmable" waters (CWA Section 101 [a][2]). The CWA addresses both point and non-point sources of pollution (Sections 402 and 319, respectively), both of which are controlled through the National Pollution Discharge Elimination System (NPDES). A NPDES permit must be obtained in order to discharge pollutants into "Waters of the U.S." In some states, the United States Environmental Protection Agency (USEPA) has delegated permitting authority to the regional water quality agency, in this case the State Water Resources Control Board (SWRCB). However, the USEPA retains authority to regulate discharges to waters on tribal lands. The CWA also

directs states to establish water quality standards for waterways in their jurisdiction and to review and update these standards every three years (Section 303[c]).

Section 303(d) of the CWA requires states to periodically prepare a list of all surface waters in their respective jurisdictions for which beneficial uses of the water—such as for drinking, recreation, aquatic habitat, and industrial use—are impaired by pollutants. These include water bodies that do not meet state surface water quality standards and are not expected to improve within the next two years. States establish a priority ranking of these impaired waters for purposes of developing water quality control plans that include Total Maximum Daily Loads (TMDLs). A TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards, and includes an allocation for each of the pollutant's sources. These water quality control plans describe how an impaired water body will meet water quality standards through the use of TMDLs.

Porter-Cologne Water Quality Act

The Porter-Cologne Water Quality Control Act provides the basis for surface water and groundwater quality regulation within California. The act established the authority of the SWRCB and the nine Regional Water Quality Control Boards (RWQCBs). The act requires the State, through the SWRCB and the RWQCBs, to designate beneficial uses of surface waters and groundwater and specify water quality objectives designed to protect those uses. These water quality objectives are presented in the Regional Water Quality Control Plans. The alternative sites fall within the boundaries of the Central Valley Regional Water Quality Control Board (CVRWQCB).

The surface water quality standards for State of California include both narrative and numerical water quality objectives to keep California's waters swimmable, fishable, drinkable, and suitable for use by industry, agriculture, and the citizens of the state. The water quality objectives are summarized in **Table 3.3-1**.

TABLE 3.3-1
WATER QUALITY STANDARDS FOR CALIFORNIA SURFACE WATERS

Constituent	Water Quality Objective
Fecal Coliform	In waters designated for contact recreation (REC-1), the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 mL, nor shall more than 10 percent of the total number of samples taken during any 30-day period exceed 400/100 mL.
Dissolved Oxygen (DO)	Within the legal boundaries of the Delta, the DO concentration shall not be reduced below: 7.0 mg/L in the Sacramento River (below the I Street Bridge) and in all Delta waters west of the Antioch Bridge; 6.0 mg/L in the San Joaquin River (between Turner Cut and Stockton, 1 September through 30 November); and 5.0 mg/L in all other Delta waters except for those bodies of water which are constructed for special purposes and from which fish have been excluded or where the fishery is not important as a beneficial use. For surface water bodies outside the legal boundaries of the Delta, the monthly median of the mean daily DO concentration shall not fall below 85 percent of saturation in the main water mass, and the 95 percentile concentration shall not fall below 75 percent of saturation. The DO concentrations shall not be reduced below the following minimum levels at any time: Waters designated WARM 5.0 mg/L; Waters designated COLD 7.0 mg/L; and Waters designated SPWN 7.0 mg/L.
Temperature	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses. Temperature objectives for COLD interstate waters, WARM interstate waters, and Enclosed Bays and Estuaries are as specified in the Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays of California including any revisions. There are also temperature objectives for the Delta in the State Water Board's 2006 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary. At no time or place shall the temperature of any COLD or WARM interstate waters be increased by more than 5° F (2.8° C) above natural receiving water temperature In determining compliance with the water quality objectives for temperature, appropriate averaging periods may be applied provided that beneficial uses will be fully protected.
pH	The pH shall not be depressed below 6.5 nor raised above 8.5.
Toxicity	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances. Compliance with this objective will be determined by analyses of indicator organisms, species diversity, population density, growth anomalies, and biotoxicity tests of appropriate duration or other methods as specified by the Regional Water Board. The Regional Water Board will also consider all material and relevant information submitted by the discharger and other interested parties and numerical criteria and guidelines for toxic substances developed by the State Water Board, the California Office of Environmental Health Hazard Assessment, the State Water Board Division

Constituent	Water Quality Objective
	of Drinking Water Programs, the U.S. Food and Drug Administration, the National Academy of Sciences, the U.S. Environmental Protection Agency, and other appropriate organizations to evaluate compliance with this objective. The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors shall not be less than that for the same water body in areas unaffected by the waste discharge, or, when necessary, for other control water that is consistent with the requirements for "experimental water" as described in Standard Methods for the Examination of Water and Wastewater, latest edition. As a minimum, compliance with this objective as stated in the previous sentence shall be evaluated with a 96-hour bioassay. In addition, effluent limits based upon acute biotoxicity tests of effluents will be prescribed where appropriate; additional numerical receiving water quality objectives for specific toxicants will be established as sufficient data become available; and source control of toxic substances will be encouraged.
Radioactive Substances	Radionuclides shall not be present in concentrations that are harmful to human, plant, animal or aquatic life, nor that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life. At a minimum, waters designated for use as domestic or municipal supply shall not contain concentrations of radionuclides in excess of the maximum contaminant levels (MCLs) specified in Table 64442 of Section 64442 and Table 64443 of Section 64443 of Title 22 of the California Code of Regulations, which are incorporated by reference. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect.
Taste and Odor	Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses.
Notes: mL = milliliters; mg/L = milligrams per liter. Source: CVRWQCB, 2016.	

Groundwater

Safe Drinking Water Act

Under the mandate of the Safe Drinking Water Act, the USEPA sets legally enforceable National Primary Drinking Water Regulations (primary standards) that apply to public water systems. These standards are established to protect human health by limiting the levels of contaminants in drinking water. The USEPA does not oversee the construction and permitting of groundwater wells, but requires that public health standards, such as an effectively installed sanitary seal, are in place, and recommends that water systems be installed to meet California Department of Public Health Standards. The USEPA will also primarily establish monitoring and operational requirements, which will typically be specific to the project area.

The on-site water supply system under Alternatives A, B, C, D, and E described in **Sections 2.3** through **2.7** would be characterized as a Non-Transient Non-Community (NTNC) Water System (USEPA, 2016a). Monitoring requirements for NTNC public water systems typically include total coliform, nitrate, inorganic chemicals, volatile organic chemicals, non-volatile synthetic organic chemicals, secondary

drinking water standard constituents, and general chemistry (including alkalinity, hardness, and minerals). The frequency of sampling varies, and may be reduced over time.

The USEPA also defines National Secondary Drinking Water Regulations (secondary standards) for contaminants that cause cosmetic and aesthetic effects, but not health effects. The USEPA recommends that these secondary standards be met but does not require systems to comply with them. Both primary and secondary drinking water standards are expressed as either Maximum Contaminant Levels (MCLs), which define the highest level of a contaminant allowed in drinking water, or Maximum Contaminant Level Goals, which define the level of a contaminant below which there is no known or expected risk to health.

Sustainable Groundwater Management Act (SGMA)

The intent of the California Sustainable Groundwater Management Act (SGMA; Water Code § 10720 *et seq*.) is to "enhance local management of groundwater consistent with rights to use or store groundwater… [and] to preserve the security of water rights in the state to the greatest extent possible consistent with the sustainable management of groundwater." The SGMA states that "any local agency or combination of local agencies overlying a groundwater basin may elect to be a groundwater sustainability agency [GSA] for that basin" (Water Code § 10723). In the groundwater basins designated by the California Department of Water Resources (DWR) as medium and high priority, local public agencies and GSAs are required to develop and implement groundwater sustainability plans (GSPs) or alternatives to GSPs. The Redding Groundwater Basin, over which the Strawberry Fields, Anderson, and Win-River Casino Sites are located, is designated as medium priority by DWR (DWR, 2014).

The Enterprise-Anderson GSA was formed in 2017 to comply with SGMA. Members of the Enterprise-Anderson GSA include the City of Redding, the City of Anderson, Anderson-Cottonwood Irrigation District (ACID), Bella Vista Water District, Clear Creek Community Services District, and Shasta County. As of August 2017, the Enterprise-Anderson GSA has not yet finalized a GSP, which would be applicable to the groundwater subbasins underlying the Strawberry Fields, Anderson, and Win-River Casino Sites (DWR, 2017a).

Title 22 California Code of Regulations (CCR)

Title 22 California Code of Regulations (CCR) Division 4, Chapter 3 regulates the sources, uses, and quality standards of recycled water in the State. Article 3, Section 60304(a) requires that any recycled water used for the irrigation of food crops, parks and playgrounds, and residential landscaping shall be a disinfected tertiary recycled water. Article 1, Section 60301.230 defines disinfected tertiary recycled water as a wastewater that has been filtered and disinfected, and which meets the following criteria:

a) The filtered wastewater has been disinfected by either: (1) A chlorine disinfection process following filtration that provides a CT (the product of total chlorine residual and modal contact

time measured at the same point) value of not less than 450 milligram-minutes per liter at all times with a modal contact time of at least 90 minutes, based on peak dry weather design flow; OR (2) A disinfection process that, when combined with the filtration process, has been demonstrated to inactivate and/or remove 99.999 percent of the plaque forming units of F-specific bacteriophage MS2, or polio virus in the wastewater. A virus that is at least as resistant to disinfection as polio virus may be used for purposes of the demonstration.

b) The median concentration of total coliform bacteria measured in the disinfected effluent does not exceed a most probable number (MPN) of 2.2 per 100 milliliters using the bacteriological results of the last seven days for which analyses have been completed and the number of total coliform bacteria does not exceed an MPN of 23 per 100 milliliters in more than one sample in a 30 day period. No sample shall exceed an MPN of 240 total coliform bacteria per 100 milliliters.

3.3.2 ENVIRONMENTAL SETTING

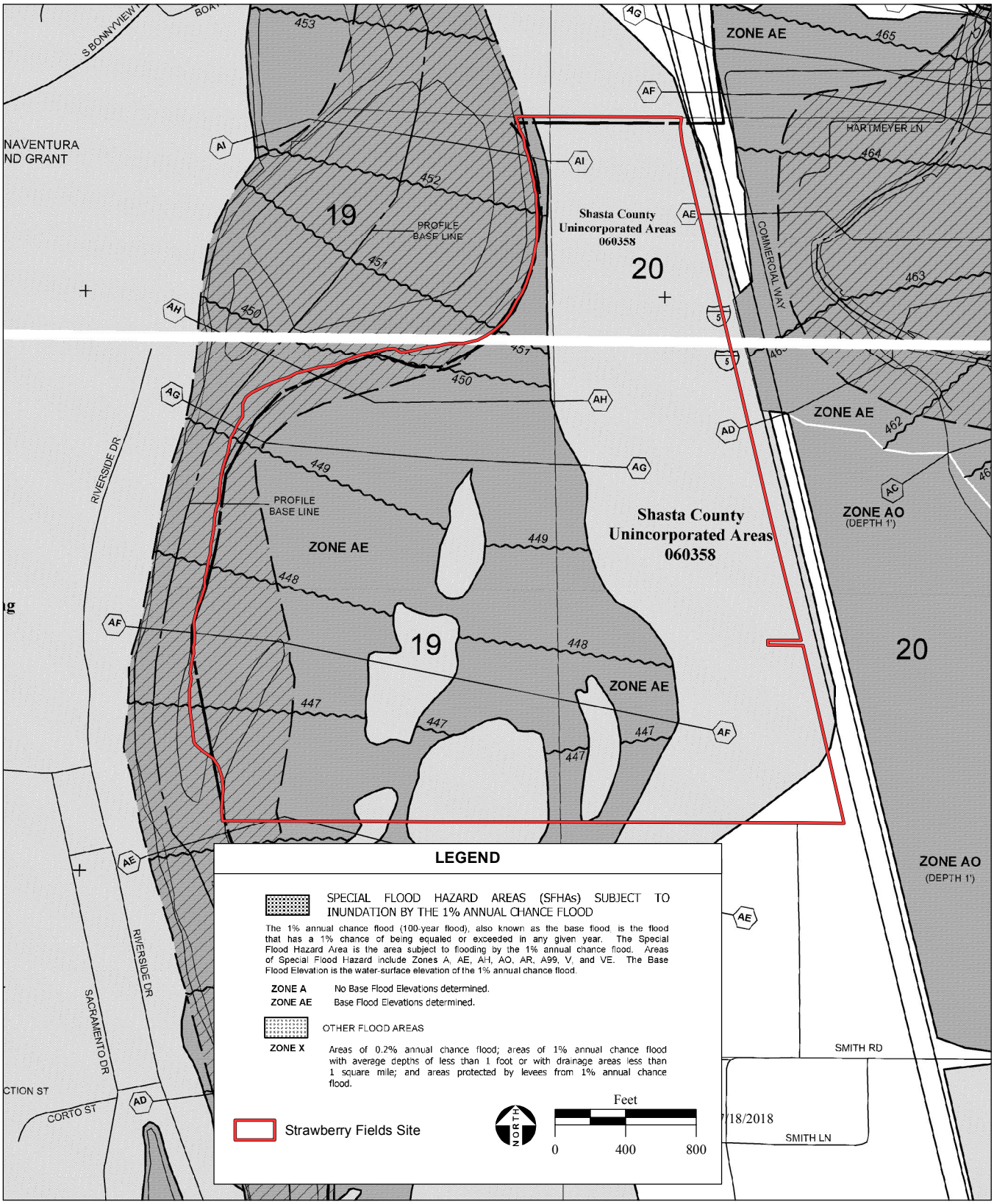
Strawberry Fields Site

Floodplain

The Disaster Relief Act of 1974 as amended by the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 created the FEMA, which is responsible for determining flood elevations and floodplain boundaries based on United States Army Corps of Engineers (USACE) studies. FEMA's floodplain designations are the appropriate flood maps to be utilized for regulatory purposes; therefore, the FEMA flood maps were used to determine the flood elevations on the various alternative sites. FEMA is also responsible for distributing Flood Insurance Rate Maps (FIRMs), which are used in the National Flood Insurance Program. These maps identify the locations of special flood hazard areas, including 100-year floodplains. The current FEMA FIRM that encompasses the Strawberry Fields Site was based on detailed cross-sections of the Sacramento River throughout the City of Redding area. These cross-sections show flood elevations for the 100-year flood event, and follow existing topography in the vicinity of the Strawberry Fields Site. The Strawberry Fields Site is located within FIRM numbers 06089C1561G and 06089C1563G. As shown in **Figure 3.3-1**, all of the Strawberry Fields Site with the exception of the far southeast corner is within the FEMA 500-year floodplain, and most of the western portion of the Strawberry Fields Site is within the 100-year floodplain (FEMA, 2011b; FEMA 2011c).

Several regulatory agencies have jurisdiction of portions of the Sacramento River, but their jurisdiction falls west of the FEMA 100-year floodplain line. The Agencies and their jurisdictional lines are as follows:

- **The Central Valley Flood Protection Board** – The Designated Floodway Line refers to the channel of the stream and that portion of the adjoining floodplain reasonably required providing for the passage of a design flood; it is also the floodway between existing levees as adopted by the Central Valley Flood Protection Board (formerly the Reclamation Board) or the Legislature.



SOURCE:FEMA FIRM effective, 3/17/2011; AES, 7/18/2018

Figure 3.3-1
Strawberry Fields Site Floodplain Map

The Designated Floodway Line follows the FEMA 100-year floodplain line, or is located west of the FEMA 100-year floodplain line adjacent to the Strawberry Fields Site.

- **The California State Lands Commission (CSLC)** – The CSLC has jurisdiction and management authority over all un-granted tidelands, submerged lands and the beds of navigable lakes and waterways. The CSLC jurisdictional line lies west of the FEMA 100-year floodplain line adjacent to the Strawberry Fields Site.

Surface Water

Regional Watershed

The 232-acre Strawberry Fields Site and the Off-site Access Improvement Areas are located within the Sacramento-Lower Cow-Lower Clear Watershed (USEPA, 2016a) within the Sacramento River Basin (USGS, 2016). The Sacramento-Lower Cow-Lower Clear Watershed covers approximately 419 square miles (approximately 268,160 acres; USGS, 2016), from its headwaters at Shasta Lake in the north to the Sacramento River in the south, with the Strawberry Fields Site in the central southern portion of the watershed (Sacramento River Watershed Program, 2016). Surrounding watersheds include the Upper Cow-Battle Watershed to the east; the Sacramento-Lower Thomes Watershed and Mill-Big Chico Watershed to the south; the Lower Cottonwood Watershed to the west; and the Sacramento-Upper Clear Watershed, Sacramento Headwaters Watershed, and Lower Pit Watershed to the north (USEPA, 2013a). The watershed includes portions of Shasta and Tehama Counties (USEPA, 2016a). Land uses within the watershed include grassland, shrubland, urban, and pasture (Sacramento River Watershed Program, 2016).

The Sacramento River, located along the western boundary of the Strawberry Fields Site, provides drinking water for residents throughout the valley, as well as irrigation water for agricultural lands. Areas near the river that are not agricultural or residential in use are primarily forest and range habitats (USEPA, 2013a). The Sacramento River is approximately 327 miles long and drains approximately 27,000 square miles of the northern Central Valley (USGS, 2011). Within the Sacramento-Lower Cow-Lower Clear Watershed, many creeks discharge into the Sacramento River, including Clear Creek, Stillwater Creek, Cow Creek, Bear Creek, Cottonwood Creek, and Battle Creek (Sacramento River Watershed Program, 2016). Additionally, ACID diverts up to 125,000 AFY of water from the Sacramento River to the Anderson-Cottonwood Canal at the seasonal ACID Diversion Dam, which is located within the City of Redding approximately 4.5 miles northwest of the Strawberry Fields Site (ACID, 2017). The CVRWQCB has established beneficial uses for each segment of the Sacramento River. The beneficial uses for the segment of river along which the Strawberry Fields Site is located include municipal and domestic supply, agricultural irrigation, agricultural stock watering, industry service supply and power, contact and noncontact recreation, freshwater habitat, migration, spawning, wildlife habitat, and navigation (CVRWQCB, 2016).

The Sacramento River from Keswick Dam to Cottonwood Creek is listed as a Category 5 on the California state 303(d) list of impaired waters. A TMDL is required for unknown toxicity (SWRCB,

2010). A Category 5 impaired water designation indicates the water quality standards are not met and a TMDL is required, but not yet completed, for at least one of the pollutants being listed. The Category 5 designation is the highest priority ranking given by the State to recognize the need for implementation of a TMDL. The expected TMDL completion date is 2019 (SWRCB, 2010).

Site Drainage

The Strawberry Fields Site is relatively flat, with elevations ranging from a high of approximately 455 feet above mean sea level (amsl) in the northeast corner to a low of approximately 430 feet amsl in the southwest corner near the Sacramento River (**Appendix C**). Most of the Strawberry Fields Site generally slopes from northeast to southwest towards the Sacramento River. The upland eastern portion of the Strawberry Fields Site adjacent to Interstate 5 (I-5) drains from north to south, with slopes of less than 0.5 percent (**Appendix C**). Surface drainage from I-5 is collected in the median or along the east side of the roadway, and is then conveyed under the roadway via a system of pipes to an earthen ditch that runs from north to south along the Strawberry Fields Site's eastern boundary. A natural swale located in the southern portion of the Strawberry Fields Site conveys drainage from both I-5 and the Strawberry Fields Site in a southwesterly direction toward the Sacramento River, as shown in Figure 3 of **Appendix C**.

The majority of the soils located in the eastern uplands portion of the Strawberry Fields Site are excessively drained to well drained sandy loam or loamy sand, while soil located in the lower elevation southwestern portions of the Strawberry Fields Site near the Sacramento River is predominately excessively drained riverwash or cobbly alluvium that is subject to frequent flooding (**Appendix C**). Refer to **Section 3.2.2** for a detailed description of the soil types present on the Strawberry Fields Site.

During precipitation events smaller than a 100-year storm event, a hydrologic and hydraulic model of Churn Creek (located approximately 0.1 miles east of the Strawberry Fields Site on the opposite side of I-5 at its closest point) shows that Churn Creek has the potential to overflow its western bank and cause a shallow overflow of 600 to 700 cubic feet per second (cfs) of runoff to flow westward over I-5 and through the Strawberry Fields Site toward the Sacramento River. However, there are no historical records on file indicating flow from Churn Creek has overtopped I-5, according to Caltrans (**Appendix C**). Additionally, the eastern bank of the Sacramento River along the eastern boundary of the Strawberry Fields Site is actively eroding during periods of exceptionally high river flows (**Appendix C**).

Groundwater

The Strawberry Fields Site overlies the Enterprise Subbasin of the Redding Groundwater Basin (**Appendix B**). The Enterprise Subbasin is bounded to the west and southwest by the Sacramento River, the east by Little Cow Creek and Cow Creek, and on the north by the Klamath Mountains. It has a surface area of approximately 95 square miles, or 60,900 acres, and is entirely contained with Shasta County (DWR, 2004a). The Enterprise Subbasin aquifer system is comprised of continental deposits of Late Tertiary to Quaternary age. These are four primary water-bearing formations within the Enterprise

Subbasin: Holocene stream channel deposits, which consist of shallow stream channel and floodplain deposits located along the western boundary of the subbasin near the Sacramento River, and which represent the upper part of the unconfined zone of the aquifer; Pleistocene terrace deposits, which consist primarily of poorly consolidated gravel deposits located near the surface along the Sacramento River; the Pliocene Tehama Formation, which consists of locally cemented silts, sands, gravel, and clay of moderate to high permeability; and the Pliocene Tuscan Formation, which consists of generally moderately to highly permeable deposits predominately associated with volcanic activity (DWR, 2004a). The aquifer is recharged by local precipitation and through percolation from surrounding water bodies, including rivers, creeks and earthen drainage ditches. The thickness of the aquifer ranges from 50 to 1,000 feet, depending on the formation (DWR, 2004a).

Groundwater Supply

The storage capacity for the entire Redding Groundwater Basin is estimated to be 5.5 million acre-feet (af) over an area of approximately 510 square miles (DWR, 2004a). In general, groundwater levels in the Enterprise Subbasin have not substantively increased or decreased in recent decades, but have fluctuated between 5 and 10 feet during drought and non-drought periods (DWR, 2004a). Historically, both the decline of groundwater levels due to multiyear periods of drought and the subsequent recovery upon the return to normal patterns of precipitation has been gradual (DWR, 2004a). The Redding Groundwater Basin is not adjudicated, meaning that a court has not defined and quantified groundwater rights for all users within the basin. Additionally, the Redding Groundwater Basin is not currently in a state of overdraft (**Appendix B**).

Groundwater elevation data from the DWR Water Data Library show there are 17 active and historic wells located within a one-mile radius of the Strawberry Fields Site (DWR, 2016a). Groundwater elevations in the vicinity of the Strawberry Fields Site were measured at State Well Number (SWN) 31N04W16M001M and SWN 31N04W29R003M, located approximately 1.2 miles northeast of the eastern border of the Strawberry Fields Site and approximately 1.2 miles southeast of the eastern border of the Strawberry Fields Site, respectively. The groundwater elevation at SWN 31N04W16M001M was 95.8 feet below ground surface (BGS) on June 24, 2009 (DWR, 2016b), the most recent date for which groundwater level data are available. From 1978 to 2009, groundwater elevations at this well have ranged from 124.0 feet BGS at their deepest in 1979 to 76.1 feet BGS at their shallowest in 1998 (DWR, 2016b). At SWN 31N04W29R003M, the groundwater elevation at the most recent measurement date (August 1, 2017) was 43.0 feet BGS; between 2001 and 2017, elevations have ranged from 57.2 feet BGS at their deepest in 2007 to 33.8 feet at their shallowest in March 2017 (DWR, 2017b). Groundwater elevations within the Shasta County portion of the Redding Groundwater Basin were measured between Spring 2015 and Spring 2016 throughout the basin, and the average change in groundwater elevation was determined to be 1.9 feet in shallow wells, 0.2 feet in intermediate wells, and 0.5 feet in deep wells (DWR, 2016c).

A groundwater elevation contour map of the Redding Groundwater Basin prepared by the DWR for Fall 2015 shows the direction of groundwater flow in the vicinity of the Strawberry Fields Site to be generally from west to east (DWR, 2016d). Groundwater beneath the Strawberry Fields Site ranges from approximately 520 to 557 feet amsl in elevation (DWR, 2016e). The closest municipal groundwater wells to the Strawberry Fields Site owned and operated by the City of Redding are Municipal Well #1 and Municipal Well #6, which are located on the west side of the Sacramento River approximately 0.5 miles south of the southwest corner of the Strawberry Fields Site (City of Redding, 2011). Currently, there are no groundwater wells on the Strawberry Fields Site.

Groundwater Quality

The CVRWQCB is responsible for formulating and implementing water quality control plans for basins within its region. The Sacramento River Basin and San Joaquin River Basin Water Quality Control Plan (Sacramento River Basin Plan) designates both beneficial uses and water quality objectives for groundwater within these basins; the Redding Groundwater Basin is included within the geographic scope of the Sacramento River Basin. Per the Sacramento River Basin Plan, all groundwater in the Sacramento River Basin, unless otherwise designated by the CVRWQCB, is considered as suitable or potentially suitable for the following beneficial uses: municipal and domestic water supply, agricultural supply, industrial service supply, and industrial process supply (CVRWQCB, 2016). The groundwater quality objectives for groundwater within the Sacramento River Basin are shown in **Table 3.3-2**. The Sacramento River Basin Plan identifies industrial and agricultural chemical use and spills, underground and above ground tank and sump leaks, landfill leachate and gas releases, septic tank failures, improper animal waste management, and chemical seepage via shallow drainage wells and abandoned wells as the primary general threats to groundwater quality within the Sacramento River Basin (CVRWQCB, 2016).

Groundwater quality of the Enterprise Subbasin is characterized by magnesium-sodium bicarbonate with locally high concentrations of manganese and iron (DWR, 2004a). The City maintains several groundwater wells in the vicinity of the site; testing for a variety of organic and inorganic constituents has shown the local groundwater supply meets most primary and secondary drinking water standards established for public health protection, and is generally of very high quality (City of Redding, 2015). However, 10 of the 12 municipal wells drilled within the Enterprise Subbasin experience manganese levels in excess of the Secondary MCL (SMCL), and many wells also have elevated levels of iron (City of Redding, 2016a). **Table 3.3-3** provides an average water quality summary for groundwater from the City through December 2015. All other constituents for which tests were performed were not detected above the laboratory method reporting limit.

TABLE 3.3-2
WATER QUALITY OBJECTIVES FOR GROUNDWATER WITHIN THE SACRAMENTO RIVER BASIN PLAN

Constituent	Objectives
Bacteria	In ground waters designated Municipal and Domestic Supply (MUN), the concentration of total coliform organisms over any 7-day period shall be less than 2.2 / 100 mL.
Chemical Constituents	Ground waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. At a minimum, ground waters designated for use as MUN shall not contain concentrations of chemical constituents in excess of the MCLs specified in the following provisions of Title 22 of the California Code of Regulations, which are incorporated by reference into this plan: Tables 64431-A (Inorganic Chemicals) and 64431-B (Fluoride) of Section 64431, Table 64444-A (Organic Chemicals) of Section 64444, and Table 64449-A (Secondary Maximum Contaminant Levels-Consumer Acceptance Limits) and 64449-B (Secondary Maximum Contaminant Levels-Ranges) of Section 64449. This incorporation-by-reference is speculative, including future changes to the incorporated provisions as the changes take effect. At a minimum, water designated MUN shall not contain lead in excess of 0.015 mg/l. To ensure that waters do not contain chemical constituents in concentrations that adversely affect beneficial uses, the Regional Water Board mat apply limits more stringent than MCLs.
Radioactivity	At a minimum, ground waters designated for use as MUN shall not contain concentrations of radionuclides in excess of the MCLs specified in Table 4 (MCL Radioactivity) of Section 64443 of Title 22 of the California Code of Regulations, which are incorporated by reference into this plan. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect.
Tastes and Odors	Ground waters shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses.
Toxicity	Ground waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life associated with designated beneficial use(s). This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances.

Source: CVRWQCB, 2016.

Anderson Site

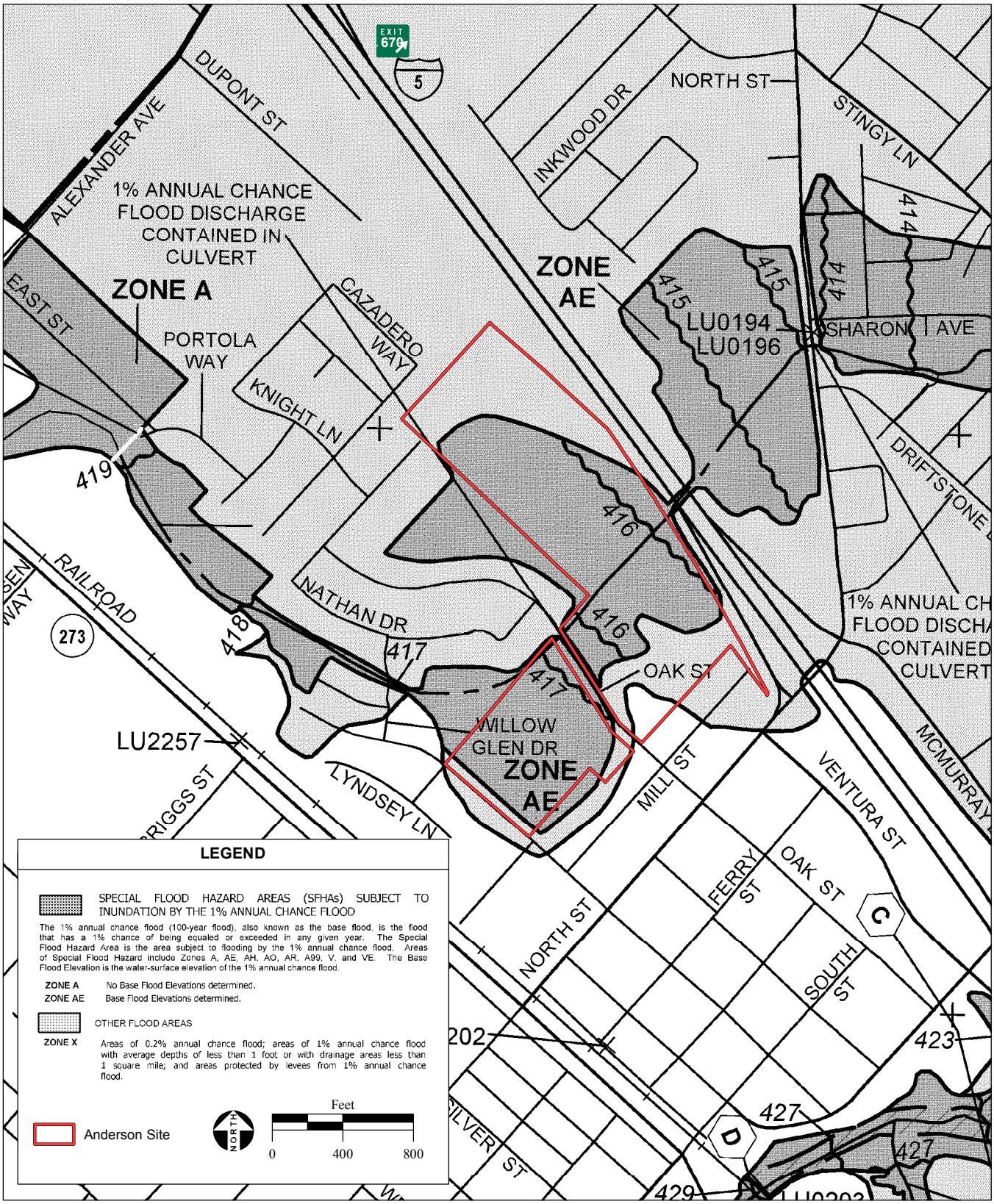
Floodplain

As shown in **Figure 3.3-2**, a majority of the Anderson Site lies within the 100-year floodplain. This large portion of the Anderson Site is designated AE, which is a designation used for areas with base flood elevations determined (FEMA, 2011a). A small portion of the southwestern region of the Anderson Site is designated Zone X, which represents areas determined to be outside of both the 100-year and 500-year floodplains. The remainder of the site is located within a portion of Zone X that is within the 500-year floodplain and outside the 100-year floodplain (FEMA, 2011a).

Surface Water

Regional Watershed

Like the Strawberry Fields Site, the Anderson Site is located within the Sacramento-Lower Cow-Lower Clear Watershed of the Sacramento River Basin; this watershed is described in detail above. The nearest natural surface water body to the Anderson Site is the Sacramento River, which travels in a general north to south direction approximately 0.8 miles to the north of the Anderson Site. The water quality of the Sacramento River is discussed in detail above.



SOURCE:FEMA FIRM effective, 3/17/2011; AES, 7/18/2018

Figure 3.3-2
Anderson Site Floodplain Map

TABLE 3.3-3
CITY OF REDDING WATER QUALITY 2015 (SYSTEM-WIDE AVERAGE)

Constituent	Units	Groundwater Average	Groundwater Standard
Aluminum[1]	ppb	61.7	100
Arsenic[1]	ppb	9.3	10
Asbestos[1]	MFL	0.27	7
Chloride[2]	ppb	9.5	500
Chlorine[1]	ppm	0.78	4.0
Copper[3]	ppm	0.28	1.3
Fluoride[1]	ppm	0.1	2.0
Iron[2]	ppb	3.56	300
Lead[3]	ppb	ND	15
Manganese[2]	ppb	42.1	50
Nitrates[1]	ppm	3.9	45
Nitrites[1]	ppm	0.125	1
Sodium	ppm	13	N/A
Specific Conductance [2]	ppm	182.2	1,600
Sulfate[2]	ppm	7.68	800
Total Coliform Bacteria	# tests	0	0
Total Dissolved Solids[2]	ppm	109.3	1,000

Notes: ND = not detected; N/A = not applicable; ppb = parts per billion; ppm = parts per million; MFL = million fibers per liter.
1 – Primary standard.
2 – Secondary standard.
3 – Samples taken July 2013.
Source: City of Redding, 2015.

Site Drainage

The Anderson Site is relatively flat with a general easterly slope towards I-5 and the Tormey Drain, which bisects the Anderson Site (**Appendix C**). The Tormey Drain collects surface flows from areas west of the Anderson Site and conveys them from southwest to northeast across the Anderson Site, eventually carrying the flows eastward beneath I-5 in a box culvert. The portion of the Anderson Site located north of the Tormey Drain flows generally from north to south, from a high point of 420 feet amsl in the northwest corner of the Anderson Site to a low point of 413 feet amsl near the eastern boundary. The portion south of the Tormey Drain generally flows from south to north, from a high point of 420 feet amsl located along the southern boundary of the Anderson Site to a low point of 413 feet amsl along the eastern boundary (**Appendix C**). The soil on the Anderson Site varies from somewhat poorly drained to well drained (NRCS, 2016a); refer to **Section 3.2.2** for further discussion.

Groundwater

The Anderson Site is situated above the Anderson Subbasin of the Redding Groundwater Basin. The general characteristics of the Redding Groundwater Basin are described in detail above. The Anderson Subbasin is bounded to the west and northwest by Klamath Mountain bedrock, to the east by the

Sacramento River, and to the south by Cottonwood Creek (DWR, 2004b). The Anderson Subbasin aquifer system is comprised of continental deposits of Late Tertiary to Quaternary age. These deposits include Quaternary deposits of Holocene alluvium and Pleistocene Modesto and Riverbank formations, and Tertiary deposits of the Tehama and Tuscan formations (DWR, 2004b). The aquifer is recharged by infiltration and stream flows at the margins of the subbasin. The thickness of the aquifer ranges from 1,000 to 4,000 feet (DWR, 2004b).

Groundwater Supply

In general the groundwater basin's water levels have not been increasing or decreasing, but fluctuating between 1 and 10 feet during normal and dry years (DWR, 2004b). The groundwater table in the vicinity of the Anderson Site ranges from 30 to 40 feet in depth, or 405 to 415 feet amsl (DWR, 2017c). The primary source of recharge in the vicinity of the Anderson Site is infiltration from the nearby Sacramento River, and direct infiltration from precipitation (DWR, 2004b).

Groundwater elevation data from the DWR Water Data Library is available for 10 active and historic wells located within a one-mile radius of the Anderson Site (DWR, 2016a). Groundwater elevation data for the seven wells located within 0.8 miles of the Anderson Site are shown in **Table 3.3-4**. SWNs 30N04W10H002M, 30N04W10H003M, 30N04W10H004M, and 30N04W10H005M are located northeast of the Anderson Site; SWNs 30N04W22F002M, 30N04W22F003M, and 30N04W22F004M are located to the south. In the period from 2010 to 2017, groundwater elevations at SWNs 30N04W10H004M and 30N04W10H005M fluctuated between 15.0 feet BGS in March 2017 at their shallowest to 26.3 feet BGS in August 2014 at their deepest (DWR, 2016a). Between 2005 and 2017, groundwater elevations at the southern cluster of three wells ranged from 43.0 feet BGS at their shallowest in March 2017 to 57.0 feet BGS at their deepest in September 2014 (DWR, 2016a). A groundwater elevation contour map of the groundwater basin prepared by DWR for Fall 2015 shows the direction of groundwater flow in the vicinity of the Anderson Site to be generally from west to east (DWR, 2016d). Groundwater beneath the Anderson Site ranges from approximately 403 to 415 feet amsl in elevation (DWR, 2016e).

TABLE 3.3-4
GROUNDWATER ELEVATIONS IN THE VICINITY OF THE ANDERSON SITE

State Well ID	Distance From Site (miles)	Groundwater Elevation (feet BGS)	Groundwater Elevation (feet amsl)	Date of Measurement
30N04W10H002M	0.7	12.9	397.6	03/14/2008
30N04W10H003M	0.7	9.8	400.8	03/14/2008
30N04W10H004M	0.7	21.9	396.9	07/31/2017
30N04W10H005M	0.7	21.4	397.3	07/31/2017
30N04W22F002M	0.8	48.3	399.6	07/31/2017
30N04W22F003M	0.8	48.9	398.8	07/31/2017
30N04W22F004M	0.8	48.8	399.0	07/31/2017

Source: DWR, 2016a.

Groundwater Quality

The SWRCB Geotracker Groundwater Ambient Monitoring Assessment (GAMA) database for groundwater quality data indicates there are approximately 89 groundwater wells within a 1.0 mile radius of the Anderson Site. **Table 3.3-5** shows all contaminants for which three or more wells in the 1.0 mile radius recorded an exceedance of the California MCL within the 10-year period from August 2007 to August 2017 (with the exception of Iron and Manganese; refer to **Table 3.3-5 - Notes**). Contaminants not listed in the table were subject to exceedance of the MCL at fewer than three wells in the period from 2007 to 2017.

TABLE 3.3-5
GROUNDWATER QUALITY OF WELLS WITHIN 1.0 MILE OF THE ANDERSON SITE, 2007 - 2017

Contaminant	MCL	Number of Wells with Data	Number of Wells with Exceedance of MCL	Percent of Wells with Exceedance of MCL
Arsenic	10.0 µg/L	17	5	29.4
Benzene	1.0 µg/L	62	9	14.5
Chromium	50.0 µg/L	22	8	36.4
cis-1,2 Dichloroethylene	6.0 µg/L	29	8	27.6
Iron	300.0 µg/L[1]	24	14	58.3
Manganese	300.0 µg/L[2]	26	5	19.2
Methyl-tert-butyl ether (MTBE)	13.0 µg/L	62	21	33.9
Radium 228	5.0 pCi/L	6	6	100.0

Notes:
1 – State Maximum Contaminant Level
2 – Federal Health Advisory Level (HAL)
Source: SWRCB, 2017.

In addition to the contaminants shown in **Table 3.3-5**, some areas of the Anderson Subbasin exhibit high concentrations of nitrate (DWR, 2004b). Nitrate levels in the vicinity of the Anderson Site itself do not appear to be significantly elevated: Of the 39 wells in a 1.0-mile radius of the Anderson Site at which testing for nitrate occurred between 2007 and 2017, only one recorded an exceedance of the MCL for nitrate; the exceedance occurred in 2008 and was by only 1.0 µg/L (11.0 µg/L relative to the MCL of 10.0 µg/L; SWRCB, 2017).

Groundwater from the Anderson Subbasin is the sole water source for the City of Anderson's municipal water supply system, and the City of Anderson regularly monitors drinking water for exceedances of primary and SMCLs. In 2016, no constituent concentrations in excess of the State MCLs were detected in samples collected from seven municipal wells throughout the City of Anderson (City of Anderson, 2017c). Municipal Well #15 (also referred to as the Automall Well; SDWIS, 2017) is the closest active municipal well to the Anderson Site; it is located immediately adjacent to the Anderson Site's northeast corner, as shown in Exhibit 4 of **Appendix B**. The Automall Well was one of the seven municipal wells tested for constituent concentrations by the City of Anderson in 2016 (City of Anderson, 2017c).

Win-River Casino Site

Floodplain

As shown in **Figure 3.3-3**, the majority of the Win-River Casino Site lies within Zone X, which is outside the 100-year floodplain. However, the northwestern edge of the Win-River Casino Site is located in Zone A, which is within the 100-year floodplain of Clear Creek (FEMA, 2011d).

Surface Water

Regional Watershed

Like the Strawberry Fields and Anderson Sites, the Win-River Casino Site is located within the Sacramento-Lower Cow-Lower Clear watershed, which is described in detail above. The closest natural surface water body to the Win-River Casino Site is Clear Creek, which is adjacent to the site's northern boundary. Clear Creek below Whiskeytown Lake is listed as a Category 5 on the California state 303(d) list of impaired waters. A TMDL is required for mercury (SWRCB, 2010). As discussed above, a Category 5 impaired water designation indicates the water quality standards are not met and a TMDL is required, but not yet completed, for at least one of the pollutants being listed. The Category 5 designation is the highest priority ranking given by the State to recognize the need for implementation of a TMDL. The expected TMDL completion date is 2021 (SWRCB, 2010). Clear Creek is a tributary of the Sacramento River, which it joins approximately 0.7 miles east of the Win-River Casino Site; the water quality of the Sacramento River is described in detail above.

Site Drainage

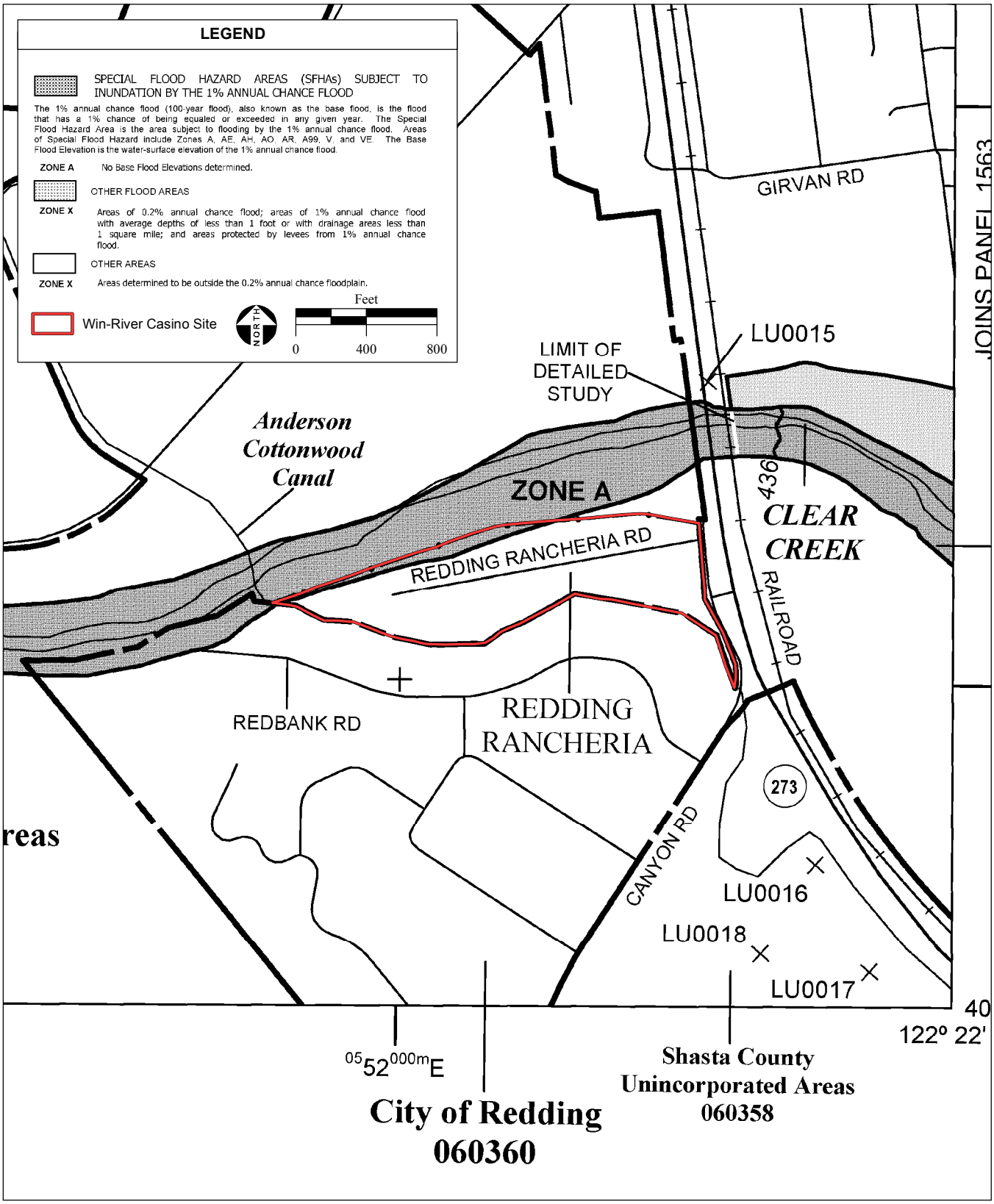
The Win-River Casino Site has gentle sloping topography from south to north towards Clear Creek, which runs from west to east immediately adjacent to the Win-River Casino Site's northern boundary. The soil on the Win-River Casino Site is well drained with more than 80 inches to the water table (NRCS, 2016b); refer to **Section 3.2.2** for further discussion. Stormwater runoff in the vicinity of the Win-River Casino Site generally flows to the north in sheet flow towards Clear Creek and south towards the Anderson-Cottonwood Canal, which bisects Clear Creek through an inverted siphon near the western boundary of the Win-River Casino Site.

Groundwater

Similar to the Anderson Site, the Win-River Casino Site is situated above the Anderson Subbasin of the Redding Groundwater Basin. The general supply and quality characteristics of groundwater within the Anderson Subbasin are described in detail above.

Groundwater Supply

There does not appear to be localized groundwater overdraft in the vicinity of the Win-River Casino Site, and the Anderson Subbasin as a whole does not appear to be in a state of overdraft (DWR, 2016e). Groundwater elevation data from the DWR Water Data Library in the vicinity of the Win-River Casino



SOURCE:FEMA FIRM effective, 3/17/2011; AES, 7/18/2018

Figure 3.3-3
Win-River Casino Site Floodplain Map

Site were measured at SWN 30N05W02Q001M, located approximately 2.0 miles south. Since 1980, groundwater elevations in this well have ranged from 89.1 to 118.4 feet BGS and from 602 to 623 feet amsl (DWR, 2016a). Groundwater elevation at the Win-River Casino Site was estimated to be between 580 and 595 feet amsl when tested in May 2016 (DWR, 2016e).

A groundwater elevation contour map prepared by DWR for spring of 2016 shows the direction of groundwater flow in the vicinity of the Win-River Casino Site to be generally west-east toward the Sacramento River (DWR, 2016e).

Groundwater Quality

The SWRCB Geotracker GAMA database for groundwater quality data indicate four wells within 1.0 mile of the Win-River Casino Site, with three clustered approximately 0.5 miles to the west and one located approximately 0.3 miles to the east (SWRCB, 2017). Of the three wells in the western cluster, one exceeded both the MCL for barium and the SMCL for iron in the period from August 2007 to August 2017; no other comparison concentrations were exceeded at any of the three wells. The eastern well exceeded both the MCL for barium and the health-based screening level (HBSL) for boron in October 2007; no exceedances of any comparison concentrations have since been reported at this well (SWRCB, 2017). No groundwater wells currently exist on the Win-River Casino Site.

3.4 AIR QUALITY

This section describes existing environmental conditions related to air quality for the alternative sites described in **Section 2.2**. The general and site-specific description of air quality contained herein provides the environmental baseline by which direct, indirect, and cumulative environmental effects are identified and measured in **Section 4.0**.

3.4.1 REGULATORY CONTEXT

National Ambient Air Quality Standards (NAAQS)

The federal Clean Air Act (CAA) of 1970, as amended, authorizes the United States Environmental Protection Agency (USEPA) to identify common air pollutants that impact air quality on a national level and establish corresponding National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. Accordingly, the USEPA has identified six criteria air pollutants (CAPs): ozone (O_3), carbon monoxide (CO), particulate matter (PM), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead (Pb). These pollutants are termed "criteria" pollutants because the USEPA has established specific concentration threshold criteria based upon specific medical evidence of health effects or visibility reduction, soiling, nuisance, and other forms of damage. The NAAQS are divided into primary standards and secondary standards, which are presented in **Table 3.4-1** below. Primary standards are designed to protect public health and secondary standards are intended to protect public welfare from effects such as visibility reduction, soiling, nuisance, and other forms of damage.

Areas are designated attainment, nonattainment, or maintenance by the USEPA depending on whether concentrations of CAPs in each area exceed the established NAAQS. Non-attainment areas are required to take steps towards attainment within a specific period of time. Once an area reaches attainment for a particular CAP, then the area is re-designated as attainment or maintenance. The CAA places most of the responsibility on states to achieve compliance with the NAAQS. States, municipal statistical areas, and counties that contain areas of non-attainment are required to develop a State Implementation Plan (SIP) that outlines policies and procedures designed to bring the nonattainment area into compliance with the NAAQS. The USEPA has designated the Sacramento Valley Air Basin (SVAB) as in attainment (or unclassified) for all NAAQSs.

State Implementation Plan

Nonattainment areas must take steps towards attainment by a specific timeline. These steps are consolidated within the SIP as mandated by the CAA. The SIP sets forth the state's strategy for achieving federal air quality standards. The SIP is not a single document, but a compilation of new and previously submitted plans, programs (such as monitoring, modeling, permitting, etc.), district or regional rules, state regulations, and federal controls. All of the items that are included in the SIP are published in the Code of

Federal Regulations (CFR). However, since Shasta County is in attainment for all NAAQSs, no SIP is required.

TABLE 3.4-1
NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutants		Primary		Secondary		Violation Criteria
		ppm	µg/m^3	ppm	µg/m^3	
Ozone	8 hours	0.070	157	0.070	157	The 3-year average of the annual 4th highest daily 8-hour maximum is not to be above 0.075 µg/m^3 (micrograms per cubic meter)
Carbon Monoxide	8 hours	9	-	-	-	If exceeded on more than 1 day per year
	1 hour	35	-	-	-	If exceeded on more than 1 day per year
Nitrogen Dioxide	Annual average	0.053	-	0.053	-	Not to be above 0.053 ppm (parts per million) in a calendar year.
	1 hour	0.100	-	-	-	The 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor is not above 0.100 ppm.
Sulfur Dioxide	1 hour	0.075	-	-	-	The 3-year average of 99th percentile of 1-hour daily maximum concentrations.
	3 hours	-	-	0.5	-	If exceeded on more than 1 day per year
PM_{10}	24 hours	-	150	-	150	Not to be above 150 µg/m^3 on more than three days over three years with daily sampling
$PM_{2.5}$	Annual arithmetic mean	-	12	-	15	The 3-year average from a community-oriented monitor is not above 15 µg/m^3.
	24 hours	-	35	-	35	The 3-year average of the 98th percentile for each population-oriented monitor within an area is not above 35 µg/m^3.
Lead	Rolling – Month Average	-	0.15	-	0.15	Not to be above 0.15 µg/m^3.

Note: ppm = parts per million; µg/m^3 = micrograms per cubic meter.
1-hour NO_2 standard was implemented in January 2011; ozone standard established December 2015. The 2008 ozone standards additionally remain in effect in some areas.
Source: USEPA, 2016b.

Federal General Conformity

Under the General Conformity Rule, the lead agency with respect to a federal action conducted in an area designated nonattainment or maintenance for any CAP is required to demonstrate that the proposed federal action conforms to the applicable SIP before the action is taken. The purpose of the rule is to ensure that federal activities do not cause or worsen existing violations of the NAAQS, or delay attainment for maintenance areas. There are two phases to a demonstration of general conformity:

1) The Conformity Review process, which entails an initial review of the federal action to assess whether a full conformity determination is necessary; and

2) The Conformity Determination process, which requires that a proposed federal action be demonstrated to conform to the applicable SIP.

The Conformity Review requires the lead agency to compare estimated emissions of CAPs to the applicable general conformity *de minimis* levels (40 CFR 153 [b][1] and [2]). If the emission estimates from step one are below the applicable threshold(s), then a general conformity determination is not necessary and the full Conformity Determination is not required. If emission estimates are greater than the applicable threshold(s), the lead agency must conduct a Conformity Determination.

Hazardous Air Pollutants (HAPs)

In addition to CAPs, the CAA requires the USEPA to regulate hazardous air pollutants (HAPs); a group of chemical pollutants that can cause adverse effects to human health and/or the environment. The USEPA maintains a list of over 180 airborne chemicals that are recognized as HAPs. Sources of HAPs include industrial processes such as petroleum refining and chrome plating operations; commercial operations such as gasoline stations and dry cleaners; cigarette smoke; and motor vehicle exhaust. Cars and trucks release at least 40 different HAPs. The most important in terms of health risk are HAPs in diesel particulate matter (DPM), benzene, formaldehyde, 1,3-butadiene, and acetaldehyde. Health effects of HAPs can include cancer, birth defects, and neurological damage.

HAPs are less pervasive in the urban atmosphere than CAPs but are linked to short-term (acute) or long-term (chronic or carcinogenic) adverse human health effects. The majority of the estimated health risk from HAPs can be attributed to relatively few compounds, the most important being the HAPs found in DPM. Section 112 of the CAA includes provisions for the promulgation of National Emissions Standards for Hazardous Air Pollutants (NESHAPs). NESHAPs are not based on effects to human health since specific concentrations of HAPs have not been evaluated to determine health-based thresholds; instead, NESHAPs are technology-based, meaning that they represent the best available control technology that an industrial sector can reasonably afford. The NESHAPs are additional federal emission limitations established for less widely emitted, but highly dangerous or toxic air pollutants that are not covered by the NAAQS. Diesel engines emit a complex mixture of air pollutants, composed of gaseous and solid material. The visible emissions in diesel exhaust are particulates that includes carbon particles or "soot." Diesel exhaust also contains a variety of HAPs and over 40 cancer causing substances. Exposure to DPM is a health hazard, particularly to children whose lungs are still developing and the elderly who may have other serious health problems.

Federal Class I Areas

Title 1, Part C of the CAA was established, in part to preserve, protect, and enhance the air quality in national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreational, scenic, or historic value. The CAA designates all international parks, national wilderness areas, and memorial parks larger than 5,000 acres and national

parks larger than 6,000 acres as "Class I areas." The CAA prevents significant deterioration of air quality in Class I areas under the Prevention of Significant Deterioration (PSD) program. The PSD program protects Class I areas by allowing only a small increment of air quality deterioration in these areas by requiring assessment of potential impacts on air quality related values of Class I areas. Any major source of emissions within 100 kilometers (km; 62.1 miles) from a federal Class I area is required to conduct a pre-construction review of air quality impacts on the area(s). A "major source" for the PSD program is defined as a facility that will emit (from direct stationary sources) 250 tons per year (tpy) of regulated pollutant. For certain industries, these requirements apply to facilities that emit (through direct stationary sources) 100 tpy or more of a regulated pollutant. Mobile sources (i.e. vehicle emissions) are by definition not stationary sources and are therefore not subject to the PSD program. Federal Class I areas within 62.1 miles of the alternative sites (the preconstruction review distance), include Lassen Volcanic National Park (USEPA, 2011a).

Tribal New Source Review (NSR)

A Tribal New Source Review (NSR) permit is required prior to construction in both attainment and nonattainment areas if the projected aggregate operational emissions from stationary sources at the proposed facility exceed the minor NSR thresholds listed in **Table 3.4-2**. NSR programs must comply with the standards and control strategies of the Tribal Implementation Plan (TIP) or SIP. If there is not an applicable SIP or TIP, the USEPA issues permits and implements the program. If applicable, the Tribe would apply for and obtain a site-specific or, if promulgated prior to the start of construction, a general minor NSR permit in accordance with the USEPA guidelines and Tribal NSR regulations.

TABLE 3.4-2
TRIBAL MINOR NEW SOURCE REVIEW THRESHOLDS

Pollutant	Emissions Thresholds for Nonattainment Areas (tpy)	Emissions Thresholds for Attainment Areas (tpy)
NO_x	5	10
ROGs	2	5
PM	5	10
PM_{10}	1	5
$PM_{2.5}$	0.6	3
CO	5	10
SO_2	5	10
Pb	0.1	0.1
Source: 40 CFR 49.153.		

California Air Resources Board (CARB)

The California Air Resources Board (CARB), a part of the California Environmental Protection Agency, is responsible for the coordination and administration of both federal and State air pollution control programs within California. In this capacity, CARB conducts research, sets California Ambient Air

Quality Standards (CAAQS), compiles emission inventories, develops suggested control measures, and provides oversight of local programs. CARB establishes emissions standards for motor vehicles sold in California, consumer products (such as hairspray or aerosol paints), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions. CARB also has primary responsibility for the development of California's SIP, for which it works closely with Air Quality Management Districts and the USEPA.

California Clean Air Act (CCAA) and Regional Air Quality Standards

The California Clean Air Act of 1988 (CCAA) requires non-attainment areas to achieve and maintain the CAAQS by the earliest practicable date, as well as requires local air districts to develop plans for attaining the State standards.

At a local level, the Shasta County Air Quality Management District (SHAQMD) has jurisdiction over Shasta County, which is the northern most portion of the SVAB. The SHAQMD attains and maintains air quality conditions in Shasta County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of the SHAQMD includes the preparation of plans for the attainment of ambient air quality standards, when needed, adoption and enforcement of rules and regulations concerning sources of air pollution, and issuance of permits for stationary sources of air pollution. It should be noted that once the land is taken into trust, the SHAQMD would not have jurisdiction over the site; the USEPA and the Tribe would have jurisdiction over the site.

Global Climate Change

Climate change is a global phenomenon cumulatively attributable to natural processes and some human activities. California has been a leader among the states in outlining and aggressively implementing a comprehensive climate change strategy that is designed to result in a substantial reduction in total statewide GHG emissions in the future. California's climate change strategy is multifaceted and involves a number of State agencies implementing a variety of State laws and policies. California laws and policies summarized below would assist in reducing GHG emissions from patrons of the Proposed Project.

Executive Order (EO) S-3-05

Executive Order (EO) S-3-05 was signed by the Governor on June 1, 2005. EO S-3-05 established the following statewide emission reduction targets:

- Reduce GHG emissions to 2000 levels by 2010;
- Reduce GHG emissions to 1990 levels by 2020; and
- Reduce GHG emissions to 80 percent below 1990 levels by 2050.

EO S-3-05 created a "Climate Action Team" or "CAT" headed by the California Environmental Protection Agency and including several other State jurisdictional agencies. The CAT is tasked by EO S-3-05 with outlining the effects of climate change on California and recommending an adaptation plan. The CAT is also tasked with creating a strategy to meet the target emission reductions. In April 2006, the CAT published an initial report that accomplished these two tasks.

California Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32)

Signed by the Governor on September 27, 2006, Assembly Bill (AB) 32 codifies a key requirement of EO S-3-05: the requirement to reduce Statewide GHG emissions to 1990 levels by 2020. AB 32 tasks CARB with monitoring State sources of GHGs and designing emission reduction measures to comply with the law's emission reduction requirements. However, AB 32 also continues the CAT's efforts to meet the requirements of EO S-3-05 and states that the CAT should coordinate overall state climate policy.

In order to accelerate the implementation of emission reduction strategies, AB 32 requires that CARB identify a list of discrete early action measures that can be implemented relatively quickly. In October 2007, CARB published a list of early action measures that could be implemented and would serve to meet about a quarter of the required 2020 emissions reductions (CARB, 2007). In order to assist CARB in identifying early action measures, the CAT published a report in April 2007 that updated their 2006 report and identified strategies for reducing GHG emissions (CAT, 2007). In the October 2007 report, CARB cited the CAT strategies and other existing strategies that may be utilized in achieving the remainder of the emissions reductions. AB 32 required that CARB prepare a comprehensive "scoping plan" that identifies all strategies necessary to fully achieve the required 2020 emissions reductions.

Executive Order S-01-07

EO S-01-07 was signed by the Governor on January 18, 2007. It mandates a statewide goal to reduce the carbon intensity of transportation fuels by at least 10 percent by 2020. This target reduction was identified by CARB as one of the AB 32 early action measures in its October 2007 report.

Executive Order B-30-15 (EO B-30-15)

EO B-30-15 was signed by the Governor on April 29, 2015. It sets interim GHG targets of 40 percent below 1990 by 2030, to ensure California will meet its 2050 targets set by AB 32.

California's Scoping Plan and Cap and Trade Program

In the adopted Climate Change Scoping Plan, CARB lays out the GHG reductions that need to be achieved and the types of measures that will be used to reach them. The Plan predicts that under a "business as usual" (BAU) scenario, 2020 GHG emissions would equal 596 million metric tons (MMT) of carbon dioxide equivalent (CO_2e). Consequently, compared to the 1990 GHG emissions inventory, emissions would need to be reduced by 169 MMT CO_2e in 2020. The Scoping Plan establishes an overall

framework for the measures that will be adopted to reduce California's GHG emissions. The Scoping Plan evaluates opportunities for sector-specific reductions, integrates all CARB and CAT early actions and additional GHG reduction measures by both entities, identifies additional measures to be pursued as regulations, and outlines the role of a cap-and-trade program. Some of the key elements of the Scoping Plan are, expanding and strengthening existing energy efficiency programs, and building and appliance standards, achieving a statewide renewables energy mix of 33 percent, developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85 percent of California's GHG emissions, and establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets.

The Scoping Plan set forth approximately 126 strategies and measures currently under consideration that would ensure a statewide reduction in GHG emissions, most strategies and measures are planning-level measures, or they apply to particular industries. There are several that can be applied to a project level analyses, such as the following:

- Diesel Anti-Idling: In July 2004, the CARB adopted a measure to limit diesel-fueled commercial motor vehicle idling;
- Achieve 50 percent statewide Recycling Goal: Achieving the State's 50 percent waste diversion mandate as established by the Integrated Waste Management Act of 1989, (AB 939, Sher, Chapter 1095, Statutes of 1989); and
- Water Use Efficiency: Approximately 19 percent of all electricity, 30 percent of all natural gas, and 88 million gallons of diesel are used to convey, treat, distribute and use water and wastewater. Increasing the efficiency of water transport and reducing water use would reduce greenhouse gas emissions.

The first update to the 2007 Climate Action Scoping Plan was released in May 2014 (CARB, 2014). The purpose of the update is to identify the next steps for California's leadership on climate change. The updated Plan outlines the progress California has made to date regarding near-term 2020 GHG limits, such as cleaner and more efficient energy, cleaner transportation, and the CARB's Cap-and-Trade Program. The updated Plan identifies six key areas where further control strategies are needed, which are: energy, transportation (vehicles/equipment, sustainable communities, housing, fuels, and infrastructure), agriculture, water, waste management, and natural and working lands. In 2016, the Legislature passed Senate Bill 32, establishing a benchmark for California to reduce GHG emissions to 40 percent below 1990 levels by 2030. CARB is in the process of updating the Scoping Plan to reflect the 2030 target and released a proposed update in January 2017. Under the proposed Scoping Plan, the six key areas where further control strategies are needed as identified in the first update are still included, in addition to a seventh area targeting the industrial sector.

3.4.2 AIR QUALITY ENVIRONMENTAL SETTING

Regional Air Quality

Regional Topography and Meteorology

Each of the alternative sites are located within Shasta County, in the northern portion of the SVAB. The Sacramento Valley is subject to two main seasonal wind patterns. The spring, summer, and fall wind pattern consists of winds that originate from the Pacific Ocean and flow through a sea-level gap in the Coast Range. In the winter season, northerly winds predominate. The mean temperature in the region has a high of 96 degrees Fahrenheit (° F) and a low of 39° F (Wunderground, 2016). The annual average rainfall in the region is approximately 24 inches.

The geographic features giving shape to the Sacramento Valley are the Coast Range to the west, the Sierra Nevada mountain range to the east, and the Cascade Range to the north. These mountain ranges channel winds through the Sacramento Valley, but also inhibit dispersion of pollutant emissions.

NAAQS Designations

As shown in **Table 3.4-3**, the USEPA has designated Shasta County as attainment or unclassified for all CAPs.

TABLE 3.4-3
NAAQS ATTAINMENT STATUS FOR SHASTA COUNTY

Pollutant	NAAQS
O_3 (8-hour)	Attainment
PM_{10}	Attainment
$PM_{2.5}$	Unclassified
CO	Unclassified
NO_2	Unclassified
SO_2	Unclassified
Pb	Unclassified
Source: CARB, 2016b.	

Hazardous Air Pollutants

In the vicinity of the alternative sites, HAPs are primarily emitted by mobile sources, such as diesel trucks. Other sources of HAP emissions in the region include mills and biomass electricity generation facilities.

Diesel Particulate Matter

An additional pollutant of concern in the region is DPM. DPM is not defined by the USEPA as a HAP; however, its components are defined as HAPs. According to CARB, the estimated health risk from HAPs

can be primarily attributed to relatively few compounds, including DPM. DPM differs from other HAPs in that it is not a single substance but a complex mixture of air HAPs, composed of gaseous and solid material from the combustion of diesel fuels. The visible emissions in diesel exhaust include PM and carbon particles or "soot." Due to the controversy surrounding DPM, an assessment of the potential impacts of DPM releases associated with the Proposed Project has been included in **Section 4.4**.

Carbon Monoxide

CO is not readily dispersed throughout the atmosphere; therefore, it is considered a localized air quality issue, close to the emission source. CO emissions generally cause acute (short-term) health threat. CO is a pollutant of concern at major signalized intersections (greater than 100,000 vehicles per day) that exhibit prolonged vehicle idling times. Shasta County is currently not designated as nonattainment or maintenance for CO.

Sources of Emissions

Strawberry Fields and Anderson Sites

CAPs in the vicinity of the Strawberry Fields and Anderson Sites are primarily emitted by mobile sources associated with transportation due to the urban nature of City of Redding and City of Anderson and close proximity of the site to Interstate 5. Emissions within the County are estimated and documented through the combined effort of the SHAQMD and CARB. **Table 3.4-4** summarizes estimated 2015 emissions of CAPs from major categories of air pollutant sources in Shasta County.

TABLE 3.4-4
SHASTA COUNTY 2015 EMISSIONS ESTIMATES

Sources	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$
	tons per day					
Total Stationary	4.692	29.072	8.961	0.235	4.996	3.730
Total Areawide	8.830	91.523	1.058	0.151	30.702	13.265
Total Mobile	7.603	64.372	12.153	0.547	1.055	0.818
Grand total for Shasta County	**21.125**	**184.971**	**22.171**	**0.933**	**36.753**	**17.813**

Source: CARB, 2017a.

Win-River Casino Site

The Tribe currently operates the Win-River Casino on the Reservation. The Casino operation emits direct CAP emissions from heating and cooling units, water heaters, and emergency generators and indirect CAP emissions from delivery trucks, patron and employee vehicles, electricity use, water and wastewater use, and solid waste disposal trucks.

Odor

Types of operations that are typically evaluated for odor concerns include waste processing and heavy industrial facilities such as wastewater treatment plants (WWTPs), landfills and composting facilities, chemical manufacturing, and confined animal facilities.

The Strawberry Fields Site and Win-River Casino Site are in the vicinity of the Clear Creek WWTP, located approximately 2 miles and 0.9 miles from the treatment plant, respectively. The Anderson Site is not vicinity of any source types that have historically been associated with odor.

Sensitive Receptors

Sensitive receptors are facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Hospitals, schools, convalescent facilities, and residential areas are examples of sensitive receptors.

Strawberry Fields Site

The nearest sensitive receptors to the Strawberry Fields Site include rural residential housing located north of the northern project boundary near the Sacramento River (the nearest of which is 150 feet from the site and approximately 290 feet northwest of the nearest proposed development on the Strawberry Fields Site); a residential subdivision is located directly across the river, approximately 330 feet from the southwestern site boundary and approximately 1,870 feet west of the nearest proposed development; and a rural residence that borders the southeast corner of the site. The nearest schools to the Strawberry Fields Site are Redding Community Day School and Stellar Secondary High School located approximately 3,200 feet west of the Strawberry Fields Site on South Bonnyview Road. The nearest medical facility is Churn Creek Healthcare, located approximately 1.8 miles north of the site.

Off-site Access Improvements

The nearest sensitive receptors to the northern Off-site Access Improvement Area along Bechelli Lane include rural residential housing west of the roadway and bounded by the Sacramento River (the nearest of which is 700 feet from the roadway) and the Hilton Garden Inn Redding, a hotel located 50 feet from the roadway.

The nearest sensitive receptors to the southern Off-site Access Improvement Area include two rural residences adjacent to the roadway, one bordering the southeast corner of the Strawberry Fields Site and the other bordering Smith Road.

Anderson Site

The nearest residential sensitive receptors to the Anderson Site are residences located to the immediate east of the site. The nearest school is Ladybug Landing Preschool and Development Center located

adjacent to the southern boundary of the Anderson Site. The nearest medical center is Anderson Walk-In Medical Clinic located approximately 600 feet east of the site.

Win-River Casino Site

The nearest residential sensitive receptor are a residences located approximately 300 feet south of the existing casino/hotel and 100 feet east of the proposed event center. The nearest school is Redding Rancheria Head Start Preschool located adjacent to the Win-River Casino Site approximately 200 feet from the nearest extent of on-site construction. The nearest medical facility is the Shasta County Public Health complex, located approximately 2.9 miles north of the Win-River Casino Site.

3.5 BIOLOGICAL RESOURCES

This section describes the existing environmental conditions for the alternative sites described in **Section 2.2**. The general and site-specific profiles of biological resources contained herein provide the environmental baseline by which direct, indirect, and cumulative environmental effects are identified and measured in **Section 4.5**, **Section 4.14**, and **Section 4.15**, respectively. This section is based in part on the following studies: A Biological Assessment (BA) by Analytical Environmental Services (AES) for the United States Fish and Wildlife Service (USFWS) addressing federally-listed species (**Appendix D-1**), a BA by AES for the National Oceanic and Atmospheric Administration's (NOAA's) National Marine Fisheries Service (NMFS) addressing federally-listed fish species (**Appendix D-2**), a biological resources assessment by North State Resources Inc. (**Appendix D-3**), and a jurisdictional wetland delineation of aquatic features on the Strawberry Fields Site by the United States Army Corps of Engineers (USACE; **Appendix D-4**).

3.5.1 REGULATORY SETTING

Federal Regulations

Federal Endangered Species Act (FESA)

USFWS enforces the provisions of the Federal Endangered Species Act (FESA) for all terrestrial species. Provisions of the FESA, as amended (16 United States Code [USC] 1531), protect federally-listed threatened and endangered wildlife and their habitat from take (50 Code of Federal Regulations [CFR] §17.11, 17.12). Under the FESA, "take" includes activities that "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" as well as any "attempt to engage in any such conduct" (16 USC 1531[3]). USFWS defines the term "harm" to include "significant habitat modification or degradation" (50 CFR §17.3). On June 29, 1995, the Supreme Court ruled that harm may include habitat modification "where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering" (U.S. No. 94-859; [1995]). If "take" of a listed species is necessary to complete an otherwise lawful activity, this triggers the need for consultation under Section 7 of the FESA for federal agencies, including Tribes. A Section 7 Biological Opinion (BO) with incidental take provisions would be rendered.

The USFWS and the NMFS implement Section 10(a)(1)(b) of the FESA, which allows non-federal entities under consultation with the USFWS and NMFS to obtain incidental take permits for federally listed wildlife. Compliance with Section 10(a)(1)(b) is not required for federally listed plants. Pursuant to the requirements of the FESA, a federal agency reviewing a proposed project within its jurisdiction must determine whether any federally-listed species may be present on the alternative sites and whether the Proposed Project will have a potentially significant impact on such species. A discussion of regionally-listed species is provided in consideration of potential impacts associated with project implementation under each alternative below. Under the FESA, habitat loss is considered to be an impact to the species. In addition, the agency is required to determine whether the project is likely to jeopardize

the continued existence of any species that is proposed for listing under the FESA or to result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 USC Section 1536[3], [4]). Therefore, should it be determined that a project would result in impacts to these species, or their habitats, it would be considered significant and require mitigation.

Critical Habitat

Critical habitat is defined under the FESA as specific geographic areas within a listed species range that contain features considered essential for the conservation of the listed species. Designated critical habitat for a given species supports habitat deemed by USFWS to be important for the recovery of the species. Under FESA, habitat loss is considered to be an impact to the species.

Migratory Bird Treaty Act (MBTA)

Migratory birds are protected under the federal Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703-712). The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird (50 CFR 10), including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). The direct injury or death of a migratory bird, due to construction activities or other construction-related disturbance that causes nest abandonment, nestling abandonment, or forced fledging would be considered take under federal law. As such, project-related disturbances must be reduced or eliminated during the nesting season. The general nesting season extends from February 15 through September 15.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act was originally enacted in 1940 to protect bald eagles and was later amended to include golden eagles (16 USC Subsection 668-668). This act prohibits take, possession, and commerce of bald and golden eagles and associated parts, feathers, nests, or eggs with limited exceptions. The definition of take is the same as the definition under the FESA. The USFWS established five recovery programs in the mid-1970's based on geographical distribution of the species, with California located in the Pacific Recovery Region. Habitat conservation efforts in the Pacific Recovery Region, including laws and management practices at federal, state, and community levels, have helped facilitate bald eagle population increases. Critical habitat for bald and golden eagles was not designated as part of the Pacific Recovery Plan created under FESA. Likewise, critical habitat was not designated by regulation under FESA. In 1995, the USFWS reclassified the bald eagle from endangered to threatened under FESA in the contiguous 48 states, excluding Michigan, Minnesota, Wisconsin, Oregon, and Washington where it had already been listed as threatened. In 2007, the bald eagle was federally delisted under FESA. However, the provisions of the act remain in place for protection of bald eagles and golden eagles.

Wetlands and Waters of the U.S.

Natural drainage channels and adjacent wetlands may be considered "Waters of the U.S." subject to jurisdiction of the USACE. The extent of jurisdiction has been defined in the CFR and is subject to interpretation of federal courts. The USACE regulates the filling or dredging of Waters of the U.S. under the authority of Section 404 of the federal Clean Water Act (CWA). The extent of jurisdiction within drainage channels is defined by "ordinary high water mark" (OHWM) on opposing channel banks. All activities that involve the discharge of dredge or fill material into Waters of the U.S. are subject to the permit requirements of the USACE. Such permits are typically issued on the condition that the applicant agrees to provide mitigation that result in "no net loss" of wetland functions or values. No permit can be issued until the United States Environmental Protection Agency (USEPA) issues a Section 401 Water Quality Certification verifying that the proposed activity will meet water quality standards.

The term "Waters of the U.S." is defined as:

- All waters currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters subject to the flow of the tide;
- All interstate waters including interstate wetlands;
- All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use or degradation of which could affect interstate or foreign commerce including any such waters; or
- Tributaries of waters identified in the bulleted items above.

The term "Wetlands" is defined as:

> Waters of the U.S. that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands that meet these criteria during only a portion of the growing season are classified as seasonal wetlands.

Magnuson-Stevens Fishery Conservation and Management Act (MSMA)

The Magnuson-Stevens Fishery Conservation and Management Act (MSMA) mandates the conservation and management of fishery resources off the coasts of the U.S., anadromous species, and Continental Shelf fishery resources of the U.S., including the conservation and management of highly migratory species through the implementation and enforcement of international fishery agreements. The NMFS enforces the MSMA, and regulates commercial and recreational fishing and the management of fisheries resources. The Sustainable Fisheries Act of 1996 amended the MSMA to include new fisheries conservation provisions by emphasizing the importance of fish habitat in regards to the overall productivity and sustainability of U.S. marine fisheries (Public Law [PL] 104-267). The revised MSMA

mandates the identification and protection of essential fish habitat (EFH) for managed species during the review of projects conducted under federal permits that have the potential to affect such habitat. Federal agencies are required to consult with NMFS on all actions and proposed actions that are authorized, funded, or undertaken by the agency, which may adversely affect EFH (MSMA 305.b.2). Adverse effects can be direct (contamination or physical disruption), indirect (loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Four Fishery Management Plans (FMPs) occur in California, Oregon, and Washington. The FMPs identify EFH for groundfish, coastal pelagic species, salmon, Pacific halibut, and highly migratory fisheries.

State and Local

Alternatives A through E involve taking land into federal trust, and the Win-River Casino Site currently has federal trust status. Therefore, State regulations would not apply to either location. However, the following State regulations would apply to the Off-site Access Improvement Areas described in **Section 2.2.2**.

California Endangered Species Act (CESA)

The California Endangered Species Act (CESA) declares that deserving plant or animal species will be given protection by the state because they are of ecological, educational, historical, recreational, aesthetic, economic, and scientific value to the people of the state. The CESA established that it is state policy to conserve, protect, restore, and enhance state-listed species and their habitats. Under State law, plant and animal species may be formally listed by the California Fish and Game Commission.

The CESA authorizes that private entities may take listed species under FESA and CESA, pursuant to a federal incidental take permit issued in accordance with Section 10 of the FESA, if the California Department of Fish and Wildlife (CDFW) certifies that the incidental take statement or incidental take permit is consistent with the CESA (Fish & Game Code § 2080.1[a]).

California Fish and Game Code

The California Fish and Game Code defines "take" (Section 86) and prohibits take of a species listed under the CESA (California Fish and Game Code §2080), or otherwise determined to be special-status species (California Fish and Game Code §§3511, 4700, and 5050). Sections 2081(b) and (c) of the CESA allow CDFW to issue an incidental take permit for a state-listed species if specific criteria outlined in Title 14 California Code of Regulations (CCR), Sections 783.4(a), (b) and CDFW Code Section 2081(b) are met. The CDFW Code Section 3503 states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by the code. Section 3503.5 states that it is unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird. Section 3513 states that it is unlawful to take or possess any migratory nongame bird as designated in the MBTA or any part of such migratory

nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the MBTA. If a project is planned in an area where a species or specified bird occurs, an applicant must design the project to avoid all take; the CDFW cannot provide take authorization under the CESA.

Native Plant Protection Act of 1977

Native Plant Protection Act of 1977 and implementing regulations in Section 1900 et seq. of the California Fish and Game Code designate special-status plant species, and provide specific protection measures for identified populations. The CDFW administers the Native Plant Protection Act.

3.5.2 STRAWBERRY FIELDS SITE

The Strawberry Fields Site is located within southern Shasta County (County), bordering the City of Redding (City). The approximately 232-acre property is comprised of seven tax parcels and is bound by Bechelli Lane to the north, the Sacramento River to the west, and private property to the south, which is currently zoned for agricultural use (**Figure 3.9-1**). East of the site is Interstate 5 (I-5), a major interstate transportation corridor that runs north-south. Elevation on the Strawberry Fields Site ranges from 134 to 139 meters above mean sea level (amsl).

Methodology

Throughout this document, federal special-status species include the federally-listed species and species of concern as identified by the USFWS official species list. State special-status species are those that are formally listed by the state and/or recognized by state agencies or other local jurisdictions because of their rarity or vulnerability to habitat loss or population decline. The following information was obtained and reviewed in support of the analysis contained herein:

- BA for USFWS addressing federally-listed species (**Appendix D-1**);
- BA for NMFS addressing federally-listed fish species (**Appendix D-2**);
- Biological Resources Assessment on the Strawberry Fields Study Area, dated November 7, 2007, by North State Resources, Inc. (NSR, 2007; **Appendix D-3**);
- Jurisdictional wetland delineation of aquatic features on the Strawberry Fields Site by the USACE (**Appendix D-4**);
- USFWS Official Species List, dated July 26, 2017 of special-status species with the potential to occur on or be affected by projects on the Enterprise U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (quad; USFWS, 2017a; **Appendix D-5)**;
- California Native Plant Society (CNPS) query, dated July 26, 2017, of special-status plant species (California Rare Plant Rank; CRPR) known to occur on the Enterprise USGS 7.5 minute topographic quad (CNPS, 2017a; **Appendix D-5**);

- California Natural Diversity Database (CNDDB) query, dated July 26, 2017, of special-status species known to occur on the Enterprise USGS 7.5 minute topographic quad (CDFW, 2017a; **Appendix D-5**);
- Critical habitat map for threatened and endangered species (USFWS, 2017b);
- USFWS National Wetlands Inventory (NWI) map of wetland features on the Strawberry Fields Site (USFWS, 2017c); and
- NOAA Fisheries West Coast Salmon and Steelhead Listings (NOAA, 2017).

Biological Surveys

Biological resource surveys and focused botanical surveys of the Strawberry Fields Site were conducted on April 25, 2007, May 3, 2007, May 9, 2007, June 27, 2007, May 16, 2016, and March 13, 2017. The purpose of the surveys was to identify habitat types, special-status species, and suitable habitat for special-status species. Species and habitat types were classified using the *Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities* (CDFG, 2000), *Botanical Survey Guidelines of the California Native Plant Society* (CNPS, 2001), and *The Jepson Manual* (Baldwin et al., 2012). Lists of plant and wildlife species observed within the site are provided in **Appendix D-6**.

Analysis

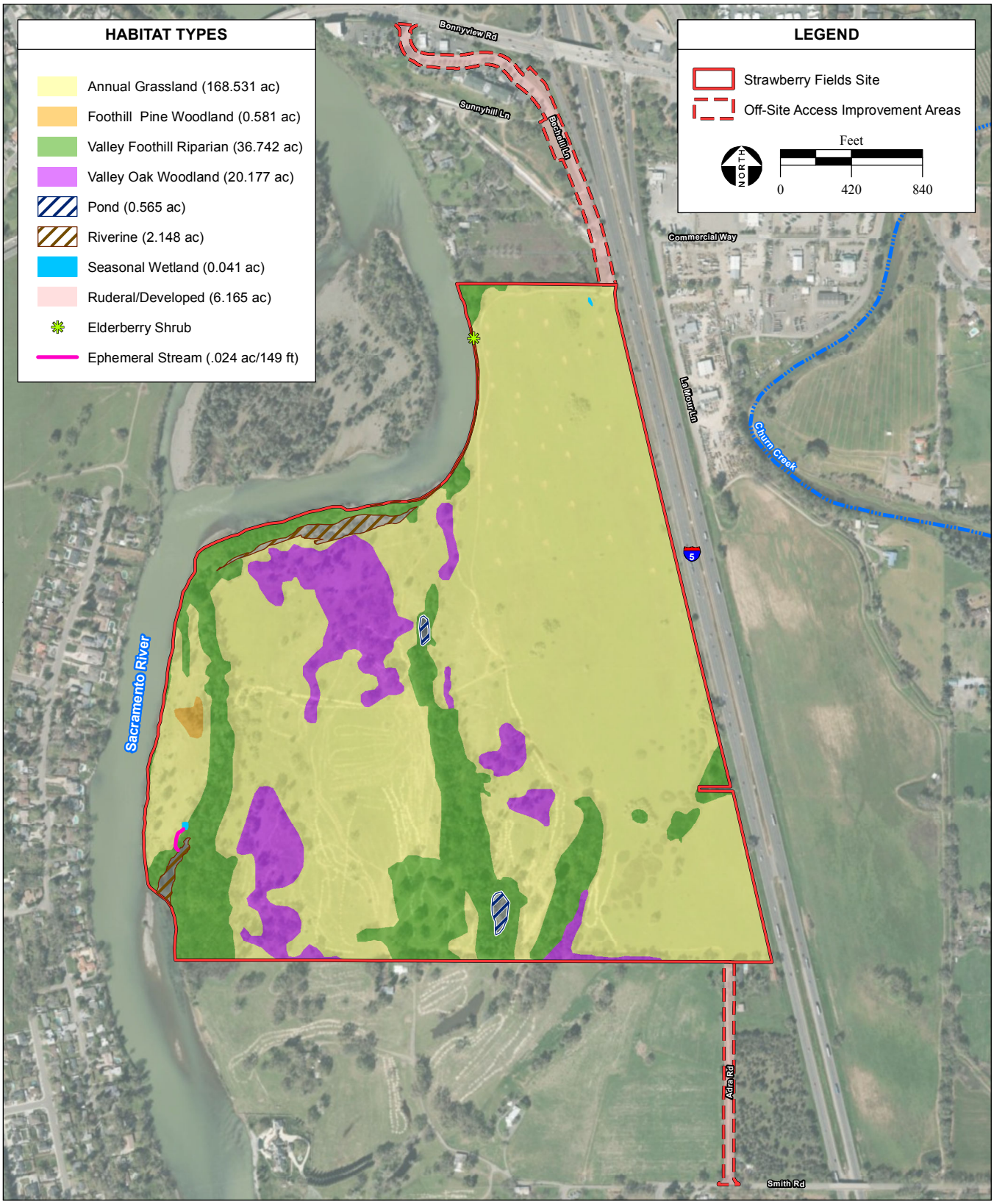
The USFWS, CNDDB, and CNPS lists of regionally-occurring federal and state special-status species are included for reference purposes within **Appendix D-5**. An analysis to determine which special-status species have the potential to occur within the Strawberry Fields Site was conducted. Habitat requirements for each species were assessed and compared to the type and quality of habitats observed during the biological surveys. Several regionally occurring species were eliminated due to a lack of suitable habitat, elevation range, lack of suitable substrate/soils, and/or geographic distribution.

Terrestrial Habitat Types

Terrestrial habitat types are shown in **Figure 3.5-1** and **Table 3.5-1**. Photographs of the biological communities are shown in **Figure 3.5-2**. The site is primarily non-native annual grassland. The remaining habitats occur nearer to the Sacramento River and consist of valley foothill riparian, valley oak woodland, riverine, and foothill pine woodland.

Non-native Annual Grassland

Non-native annual grassland was the dominant habitat type on the Strawberry Fields Site. The dominant grassland species include: European silver hairgrass (*Aira cayophyllea*), medusahead (*Taeniatherum caput-medusae*), yellow star-thistle (*Centaurea solstitialis*), soft chess (*Bromus hordeaceus*), Spanish lotus (*Lotus purshianus*), rattail fescue (*Vulpia myuros*), black mustard (*Brassica nigra*), ripgut brome (*Bromus diandrus*), and winter vetch (*Vicia villosa*). Native plants were observed only on the gravel bar



SOURCE: USDA aerial photograph, 7/26/2014; ESRI Data, 2016; AES, 7/18/2018

Figure 3.5-1
Habitat Types - Strawberry Fields Site

PHOTO 1: Taken in the northwestern part of the Strawberry Fields Site, looking east.

PHOTO 2: Southwestern riverine habitat, looking east.

PHOTO 3: Taken in the southwestern part of the Strawberry Fields Site, looking east.

PHOTO 4: Taken in the central part of the Strawberry Fields Site, looking north.

PHOTO 5: Taken in the southwestern part of the Strawberry Fields Site, looking north.

SOURCE: AES, 8/11/2017

Figure 3.5-2
Strawberry Fields Site Photographs

and on the riverwash land type, and include showy milkweed (*Asclepias speciosa*), California brickellbush (*Brickellia californica*), yerba santa (*Eriodictyon californicum*), naked-stemmed buckwheat (*Eriogonum nudum*), Oregon false goldenaster (*Heterotheca oregana*), woolly-fruited lomatium (*Lomatium dasycarpum*), and silver bush lupine (*Lupinus albifrons*). Small stands of Himalayan blackberry (*Rubus discolor*) and narrowleaf willow (*Salix exigua*) are found scattered throughout this habitat.

TABLE 3.5-1
STRAWBERRY FIELDS SITE HABITAT TYPES

Habitat Type	Acreage	Percentage
Non-Native Annual Grassland	168.53	74%
Foothill Pine Woodland	0.58	0.25%
Riverine (Sacramento River)	2.15	0.94%
Valley Foothill Riparian	36.74	16%
Valley Oak Woodland	20.18	8.9%

Foothill Pine Woodland

The foothill pine woodland occurs in the western portion of the Strawberry Fields Site near the Sacramento River on an old adjacent gravel bar. This habitat was dominated by tall foothill pine (*Pinus sabiniana*), whiteleaf manzanita (*Arctostaphylos manzanita*), Himalayan blackberry (*Rubus armeniacus*), and poison oak (*Toxicodendron diversilobum*). The grass species that are present are similar to those found in the non-native annual grassland habitat and include California brickellbush (*Brickellia californica*), California poppy (*Eschscholzia californica*), ripgut brome, European silver hairgrass, naked-stemmed buckwheat (*Eriogonum nudum*), rattail fescue, soft chess, and yellow star-thistle.

Riverine

The riverine habitat on the Strawberry Fields Site contains a backwater of the Sacramento River and a portion of the floodplain habitat. The main channel of the Sacramento River runs adjacent to the Strawberry Fields Site. The river contains an OHWM throughout the year, but due to the seasonal scouring caused by changing water volume and velocity, most plant species are unable to establish. Approximately 325 linear feet of backwater and approximately 950 linear feet of floodplain habitat from the Sacramento River occur on the site. The backwater provides suitable juvenile rearing habitat for various aquatic species, however, does not generally contain the primary constituent elements associated with other life stage usages (i.e. no spawning flows or gravels). The floodplain habitat is a depositional area (i.e. gravel bar) on the outside of a bend in the river that inundates during periods of high water.

Valley Foothill Riparian

Valley foothill riparian habitat is present primarily in the southern and western portions of the Strawberry Fields Site. Dominant vegetation include black locust (*Robinia pseudoacacia*), California black walnut (*Juglans californica*), Fremont cottonwood (*Populus fremontii*), tree-of-heaven (*Ailanthus altissima*), and valley oak (*Quercus lobata*). The vegetative understory is dominated by arroyo willow (*Nerium oleander*), blue elderberry (*Sambucus cerulea*), California wild grape (*Vitis californica*), California coffeeberry (*Frangula californica*), Himalayan blackberry, narrowleaf willow (*Salix exigua*), and oleander (*Nerium oleander*). The presence of grass species is low but includes California pipevine (*Aristolochia californica*), goose grass (*Galium aparine*), mugwort (*Artemisia douglasiana*), and Santa Barbara sedge (*Carex barbarae*).

Valley Oak Woodland

Valley oak woodland is found throughout the central portions of the Strawberry Fields Site and is dominated by valley oak (*Quercus lobata*). Other tree species occurring in this plant community include Oregon ash (*Fraxinus latifolia*), foothill pine (*Pinus sabiniana*), and interior live oak (*Quercus wislizenii*). Shrub species are not common in this habitat type; however, several were identified, including California coffeeberry (*Rhamnus californica*), Himalayan blackberry, blue elderberry, and poison oak. Grassland species identified include black mustard, California poppy, European silver hairgrass, slender oat (*Avena barbata*), rattail fescue, ripgut brome, soft chess, and yellow star-thistle.

Aquatic Habitat Types

The following three aquatic habitats were identified on the Strawberry Fields Site (**Figure 3.5-1**): seasonal wetlands, an ephemeral stream, and ponds.

Seasonal Wetlands

Two seasonal wetlands (totaling approximately 0.041 acres) were identified in the Strawberry Fields Site (**Figure 3.5-1**). The wetland located in the northeast corner of the site exhibits indicators of wetland hydrology (sediment deposits), hydric soils (uncommon redoximorphic concentrations), and is dominated by several types of hydrophytes including hairy purslane speedwell (*Veronisa peregrina*), horsetail (*Equisetum laevigatum*), and bermuda grass (*Cynodon dactylon*). The second wetland is located in the southwest portion of the site and exhibits similar indicators, and is connected directly to the Sacramento River by an ephemeral stream.

Ephemeral Stream

An ephemeral stream was identified within the Strawberry Fields Site (approximately 149 linear feet), and intermittently conveys water from the Sacramento River to the second seasonal wetland during high flow events. Ephemeral streams generally contain water only during high flows, flooding, or extreme rain

events, and seasonally dry out. The ephemeral stream does not connect to the Sacramento River year round and does not contain fish-rearing habitat during years of average or below average rainfall.

Ponds

Two open water ponds (totaling approximately 0.57 acres) were identified on the Strawberry Fields Site, and are located in the valley foothill riparian habitat in the south central parts of the site. Both contain standing water and various hydrophilic/aquatic vegetation species.

Wetlands and Waters of the U.S.

A jurisdictional delineation of the Strawberry Fields Site was conducted on June 15, 16, and 21, in 2006, and was re-verified and updated on December 16, 2016, and March 13, 2017. The delineation methodology included field observations and identifying positive indicators of hydrophytic vegetation, hydrology, and soils, as outlined in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987). Other potential Waters of the U.S. were determined based on the presence of an OHWM and/or the qualification of the feature as a tributary to Waters of the U.S. A preliminary jurisdictional determination of these features was issued by the USACE on March 20, 2017, and included the aquatic features and riverine habitat types shown in **Figure 3.5-1**. The wetland delineation and USACE jurisdictional determination are provided in **Appendix D-4**.

Wildlife

Wildlife species observed on the Strawberry Fields Site during surveys include the black tailed jack rabbit (*Lepus californicus*), mule deer (*Odocoileus hemionus),* grey squirrel (*Sciurus griseus*), red-tailed hawk (*Buteo jamaicensi*), western scrub jay (*Aphelocoma californica*), killdeer (*Charadrius vociferus*), great blue heron (*Ardea herodias*), American crow (*Corvus brachyrhynchos*), Canada goose (*Branta canadensis*), Brewer's blackbird (*Euphagus cyanocephalus*), and western meadowlark (*Sturnella neglecta*). Bald eagles were observed foraging on the site, but not nesting.

Special-Status Species

Special-status species with the potential to occur on the Strawberry Fields Site are listed in **Table 3.5-2**. Based on biological desktop review and field survey results, the Strawberry Fields Site may provide habitat for 14 special-status species; species with the potential to occur on the Strawberry Fields Site are further discussed below.

TABLE 3.5-2
POTENTIALLY OCCURRING SPECIAL-STATUS SPECIES ON THE STRAWBERRY FIELDS SITE

Scientific Name Common name	Federal/ State/CRPR	Distribution	Habitat Requirements	Period of Identification	Potential to Occur On Site
PLANTS					
Cryptantha crinita Silky cryptantha	--/--/1B.2	Occurs in Shasta and Tehama counties, California.	Annual herb that requires gravelly streambeds in cismontane woodland, lower montane coniferous forest, riparian forest, riparian woodland, valley and foothill grassland habitat types. Elevation: 61 – 1215 meters.	April - May	**Unlikely.** Marginal habitat for this species is present on site. This species was not observed during surveys.
Juncus leiospermus var. leiospermus Red Bluff dwarf rush	--/--/1B.1	Occurs in Butte, Placer, Shasta and Tehama counties, California.	Annual herb found in seasonally moist habitats that include meadows and seeps, vernal pools, and vernally mesic areas within chaparral, cismontane woodland, and valley and foothill grassland. Elevation: 35 – 1250 meters.	March – June	**Unlikely.** Marginal habitat for this species is present on site. This species was not observed during surveys.
Legenere limosa Legenere	--/--/1B.1	Known to occur in Alameda, Lake, Monterey, Napa, Placer, Sacramento, Santa Clara, Shasta, San Joaquin, San Mateo, Solano, Sonoma, Stanislaus, Tehama, and Yuba counties.	Found in vernal pools. Elevation: 1 – 880 meters.	April-June	**No.** Suitable habitat for this species does not occur on site.
Orcuttia tenuis Slender Orcutt grass	FT/CE/1B.1	Known from Butte, Lake, Lassen, Modoc, Plumas, Sacramento, Shasta, Siskiyou, and Tehama counties.	Annual herb found in gravelly vernal pools. Elevation: 35 – 1760 meters.	May-October	**No.** Suitable habitat for this species does not occur on site.
ANIMALS					
Invertebrates					
Branchinecta conservatio Conservancy fairy shrimp	FE/--/--	The species is currently known from several disjunct populations: the Vina Plains in Tehama County, south of Chico in Butte County, the Jepson Prairie Preserve and surrounding area in Solano County, Sacramento National Wildlife Refuge in Glenn County, Mapes Ranch west of Modesto, San Luis National Wildlife Refuge and the Haystack Mountain/Yosemite Lake area in Merced County, and two locations on the Los Padres National Forest in Ventura County.	Endemic to vernal pools in the northern two-thirds of the Central Valley.	December-May	**No.** Suitable habitat for this species does not occur on site.

Scientific Name Common name	Federal/ State/CRPR	Distribution	Habitat Requirements	Period of Identification	Potential to Occur On Site
Branchinecta lynchi Vernal pool fairy shrimp	FT/--/--	Vernal pool fairy shrimp are known from a total of 32 populations located in an area extending from Shasta County through most of the length of the Central Valley to Tulare County, and along the central coast range from northern Solano County to Pinnacles in San Benito County. Five additional, disjunctive populations exist near Soda Lake in San Luis Obispo County, in the mountain grasslands of northern Santa Barbara County, on the Santa Rosa Plateau in Riverside County, near Rancho California in Riverside County.	Found in vernal pools in the Central Valley, coast ranges, and a limited number of sites in the Transverse Ranges and Riverside County, California.	December-May	**No.** Suitable habitat for this species does not occur on site.
Desmocerus californicus dimorpha Valley Elderberry Longhorn Beetle (VELB)	FT/--/--	Restricted to the Central Valley from Redding to Bakersfield. Counties include Amador, Butte, Calaveras, Colusa, El Dorado, Fresno, Glenn, Kern, Madera, Mariposa, Merced, Napa, Placer, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Yolo, and Yuba counties; 0-762 meters elevation.	Found in riparian forest communities. Exclusive host plant is elderberry (*Sambucus* species), which must have stems ≥ 1-inch in diameter for the beetle.	Year-round	**Yes.** Suitable habitat for this species is present on site. Elderberry shrubs were observed during surveys.
Lepidurus packardi Vernal pool tadpole shrimp	FE/--/--	Known from 18 populations in the Central Valley, ranging from east of Redding in Shasta County south to the San Luis National Wildlife Refuge in Merced County, also from a single vernal pool complex on the San Francisco Bay National Wildlife Refuge in the City of Fremont.	Life cycle is within vernal pools and valley foothill grassland swales.	December-May	**No.** Suitable habitat for this species does not occur on site.
Fish					
Hypomesus transpacificus Delta smelt	FT/CT/--	Occurs almost exclusively in the Sacramento-San Joaquin estuary, from the Suisun Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, Solano, and Yolo counties. May also occur in the San Francisco Bay.	Found in estuarine waters. Majority of life span is spent within the freshwater outskirts of the mixing zone (saltwater-freshwater interface) within the Delta.	Consult Agency	**No.** The site is not estuarine, and is out of range of this species.
Onorhynchus Salmo mykiss steelhead	FT/--/--	Spawn in the Sacramento and San Joaquin Rivers and tributaries before migrating to the Delta and Bay Area.	Found in cool, clear, fast-flowing permanent streams and rivers with riffles and ample cover from riparian vegetation or overhanging banks. Spawning: streams with pool and riffle complexes.	Consult Agency	**Yes.** Suitable habitat for this species is present on site. Critical Habitat for this species exists within the Sacramento River.

Scientific Name Common name	Federal/ State/CRPR	Distribution	Habitat Requirements	Period of Identification	Potential to Occur On Site
(Northern California Distinct Population Segment)			For successful breeding, require cold water and gravelly streambed.		
Oncorhynchus tshawytscha Chinook salmon Central Valley Spring-Run	FT/CT/--	Spawn in the Sacramento river and some of its tributaries. Juveniles migrate from spawning grounds to the Pacific Ocean.	Spawning occurs in large deep pools in tributaries with moderate velocities and a large bubble curtain at the head.	Consult Agency	**Yes.** Suitable habitat for this species is present on site. Critical Habitat for this species exists within the Sacramento River.
Oncorhynchus tshawytscha Chinook salmon Winter-Run, Sacramento River	FE/CE/--	Spawn in the upper Sacramento River. Juveniles migrate from spawning grounds to the Pacific Ocean.	Returns to the Upper Sacramento River in the winter but delay spawning until spring and summer. Juveniles spend 5-9 months in the river and estuary before entering the ocean.	Consult Agency	**Yes.** Suitable habitat for this species is present on site. Critical Habitat for this species exists within the Sacramento River.
Acipenser medirostris Green sturgeon, southern Distinct Population Segment (DPS)	FT/--/--	Spawn in Sacramento and Feather rivers; juveniles rear mainly in the estuary.	Preferred spawning substrate is large cobble, but can range from clean sand to bedrock. Spawn in the mainstem Sacramento River when temperatures are 46 to 60 degrees Fahrenheit.	Consult Agency	**Yes.** Suitable habitat for this species is present on site. Critical Habitat for this species exists within the Sacramento River.
Amphibians					
Rana aurora draytonii California red-legged frog (CRLF)	FT/CSC/--	Known to occur along the Coast from Mendocino County to Baja California, and inland through the northern Sacramento Valley into the foothills of the Sierra Nevada mountains, south to eastern Tulare County, and possibly eastern Kern County. Currently accepted range excludes the Central Valley.	Occurs in permanent and temporary pools of streams, marshes, and ponds with dense grassy and/or shrubby vegetation. Elevations range from 0-1160 meters	November – March (breeding) June - August (non-breeding)	**Unlikely.** Suitable habitat for this species is present on site. This species was not observed during surveys.
Rana boylii Foothill yellow-legged frog (FYLF)	--/CCT, CSC/--	Known to occur throughout most of northern California, west of the Cascades and south along the coast to the San Gabriel Mountains, and south along the western side of the Sierra Nevada Mountains and into Kern County.	Requires shallow, flowing water in moderate sized streams with some cobble substrate.	November - March (breeding) June - August (non-breeding)	**Unlikely.** Suitable habitat for this species is present on site. This species was not observed during surveys.

Scientific Name Common name	Federal/ State/CRPR	Distribution	Habitat Requirements	Period of Identification	Potential to Occur On Site
Spea hammondii Western spadefoot toad	--/CSC/--	Known to occur from the north end of California's great central valley near Redding, south, east of the Sierras and the deserts, into northwest Baja California.	Prefers open areas with sandy or gravelly soils, in a variety of habitats including mixed woodlands, grasslands, chaparral, sandy washes, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. Rainpools which do not contain bullfrogs, fish, or crayfish are necessary for breeding. Elevations range from 0-1,200 meters.	November-March	**Yes.** Suitable habitat for this species is present on site. This species was not observed during surveys.
Birds					
Agelaius tricolor Tricolored blackbird	--/CSC/--	California and Baja California, Mexico.	Nests in dense thickets of cattails, tules, willow, blackberry, wild rose, and other tall herbs near fresh water.	All Year	**Yes.** Suitable habitat for this species is present on site. This species was not observed during surveys.
Haliaeetus leucocephalus Bald eagle	--/CE/--	Nests in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, Humboldt, and Trinity Counties. Winters throughout most of California.	Found near ocean shorelines, lakes, reservoirs, river systems, and coastal wetlands. Usually less than 2 km to water that offers foraging opportunities. Suitable foraging habitat consists of large bodies of water or rivers with abundant fish and adjacent perching sites such as snags or large trees.	Year-round	**Yes.** Suitable habitat for this species is present on site. This species was observed foraging during previous surveys.
Riparia Bank swallow	--/CT/--	About 50-60 colonies remain along the middle Sacramento River and 15-25 colonies occur along lower Feather River where the rivers meanders still in a mostly natural state. Other colonies persist along the central coast from Monterey to San Mateo counties, and northeastern California in Shasta, Siskiyou, Lassen, Plumas, and Modoc counties.	Colonial nester; nests primarily in riparian scrub, riparian woodland, and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting holes.	All year	**Yes.** Suitable foraging habitat for this species is present on site. This species was observed during previous surveys.
Strix occidentalis caurina Northern spotted owl	FT/--/--	Geographic range extends from British Colombia to northwestern California south to San Francisco. The breeding range includes the Cascade Range, North Coast Ranges, and the Sierra Nevada.	Resides in mixed conifer, redwood, and Douglas-fir habitats, from sea level up to approximately 2,300 meters. Appear to prefer old-growth forests, but use of	Year-round	**No.** Suitable habitat for this species does not occur on site.

Scientific Name Common name	Federal/ State/CRPR	Distribution	Habitat Requirements	Period of Identification	Potential to Occur On Site
		Some breeding populations also occur in the Transverse Ranges and Peninsular Ranges.	managed (previously logged) lands is not uncommon. Owls do not appear to use logged habitat until approximately 60 years after logging unless some larger trees or snags remain after logging. Nesting habitat is a tree or snag cavity, or the broken top of a large tree. Requires a nearby, permanent source of water. Foraging habitat consists of any forest habitat with sufficient prey (e.g. flying squirrels, mice, and voles).		
Reptiles					
Emys marmorata Western pond turtle	--/CSC/--	Distribution ranges from Washington to northern Baja California.	Inhabit rivers, streams, lakes, ponds, reservoirs, stock ponds, and permanent wetland habitats with basking sites.	Year-round	**Yes.** Suitable habitat for this species is present on site. This species was not observed during surveys.

*NOTE: The listing status of green sturgeon and determination of its critical habitat are designated by NMFS, and thus this species does not appear on the species lists.
Source: USFWS, 2017a; CDFW, 2017a; CNPS, 2017a; NMFS, 2009.

STATUS CODES

FEDERAL: United States Fish and Wildlife Service
FE Federally Endangered
FT Federally Threatened

STATE: California Department of Fish and Wildlife
CE California Listed Endangered
CT California Listed Threatened
CCT California Candidate Threatened
CSC California Species of Special Concern

OTHER: California Native Plant Society (California Rare Plant Rank)
1A Plants Presumed Extinct in California
1B Plants Rare, Threatened, or Endangered in California and Elsewhere
2 Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere

Threat Ranks
0.1 Seriously threatened in California (high degree/immediacy of threat)
0.2 Fairly threatened in California (moderate degree/immediacy of threat)

Silky Cryptantha (Cryptantha crinite)

FEDERAL STATUS – NONE
STATE STATUS – NONE
OTHER – CRPR 1B.2

Silky cryptantha is a small, annual herb in the Boraginaceae family that occurs in Shasta and Tehama counties, in California. This species is an annual herb that requires gravelly streambeds in cismontane woodlands, lower montane coniferous forests, riparian forests, riparian woodlands, and valley and foothill grasslands. It grows up to 30 or 40 centimeters in height, and the branching stem and leaves are covered in hairs. Silky cryptantha grow between elevations of 61 to 1215 meters amsl (CNPS, 2017b). It blooms from April to May.

Suitable habitat exists on site within the riverine gravel bars along the Sacramento River, although occurrence is unlikely. The nearest CNDDB occurrence is approximately 5.5 miles from the Strawberry Fields Site, and was observed in 1937 (CDFW, 2017b). This species was not observed during surveys, which were conducted during the identifiable bloom season.

Red Bluff Dwarf Rush (Juncus leiospermus var. leiospermus)

FEDERAL STATUS – NONE
STATE STATUS – NONE
OTHER – CRPR 1B.1

Red Bluff dwarf rush is an annual herb from the rush family (Juncaceae). It can be found in seasonally moist habitats that include meadows and seeps, vernal pools, and vernally mesic areas within chaparral, cismontane woodland, and valley and foothill grassland. The known range includes Butte, Placer, Shasta and Tehama Counties (CNPS, 2017c) in elevations from 35 to 1,250 meters amsl. This species blooms from March through May.

Suitable habitat exists on site within the aquatic features, although occurrence is unlikely. The nearest CNDDB occurrence is approximately 1.5 miles from the Strawberry Fields Site, and was observed in 2002 (CDFW, 2017b). This species was not observed during surveys, which were conducted during the identifiable bloom season.

Valley Elderberry Longhorn Beetle (Desmocerus californicus dimorphus; VELB)

FEDERAL STATUS – THREATENED
STATE STATUS – NONE

The USFWS formally designated the Valley Elderberry Longhorn Beetle (VELB) as threatened in 1980. VELB are completely dependent on the elderberry (*Sambucus* spp.) as a host plant, and are found throughout California's Central Valley (USFWS, 2006). Typical VELB habitat consists of riparian forests with an understory of elderberry shrubs (USFWS, 1999). The USFWS considers elderberry shrubs with a

basal stem diameter larger than 1-inch as suitable VELB habitat (USFWS, 1999). Female VELB lay eggs in the crevices of elderberry bark. Upon hatching, larvae tunnel into elderberry stems and feed. Larvae remain within the soft pith of the elderberry plant and feed for 1 to 2 years. Adults emerge from pupation during spring as the elderberry begins to flower. Adult VELB feed on the elderberry foliage until breeding occurs.

A VELB protocol-level survey in 2007 recorded 13 elderberry shrubs with VELB exit holes (**Appendix D-3**). However, during the 2016 and 2017 surveys, only one elderberry shrub was observed within the Strawberry Fields Site; the previously recorded shrubs could not be located. Originally identified shrubs may have been eradicated due to recent drought conditions or on-going cattle grazing. The singular elderberry shrub identified during the recent 2016-2017 surveys is located in the northwestern portion of the site along the Sacramento River, and does not contain indicators of VELB presence (**Figure 3.5-1**).

Steelhead (Oncorhynchus Salmo mykiss) – Northern California DPS

FEDERAL STATUS – THREATENED
STATE STATUS – NONE

The northern California steelhead (*Oncorhynchus mykiss*) DPS includes naturally spawned anadromous steelhead originating below natural and manmade impassable barriers in California coastal river basins from Redwood Creek to and including the Gualala River (NOAA, 2017). The range can include portions of Amador, Alameda, Butte, Calaveras, Contra Costa, Colusa, Glenn, Mariposa, Merced, Nevada, Placer, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tuolumne, Yolo, and Yuba counties.

Adult steelhead begin their migration from the ocean in the late fall through early winter and typically arrive at their spawning grounds between December and April, spawning shortly after arrival. Unlike other Pacific Coast salmonid species, steelhead do not usually die after spawning. Spawning takes place in relatively shallow water, typically in glides and shallow runs at depths ranging from 0.2 m to 1.0 m. Preferred spawning substrate consists of gravel ranging from 0.3 cm to 10 cm in diameter. The optimum temperature for egg development is 9 to 11 degrees Celsius (° C; 48 to 52 degrees Fahrenheit [° F]). After emergence, fry seek shallow edge water habitat for several months after which they disperse into suitable mid-channel habitat. Optimum juvenile growth and survival occurs at temperatures ranging from 13 to 17° C (55 to 64° F) with dissolved oxygen (DO) levels greater than 9 milligrams per liter. Juveniles remain in the freshwater environment for one to two years where they forage mainly on aquatic invertebrates prior to migrating to the Pacific Ocean. They typically spend one to three years in near shore saltwater and occasionally pelagic habitat foraging on crustaceans, small fish, and squid before reaching maturity and returning to their natal streams to spawn (Moyle, 2002; McEwan et al., 1996).

The riverine habitat on site and the Sacramento River adjacent to the site contain suitable habitat and are listed as critical habitat for this species (USFWS, 2017b).

Chinook Salmon (Oncorhynchus tshawytsha) – Sacramento River Winter-Run ESU

FEDERAL STATUS – ENDANGERED
STATE STATUS – ENDANGERED

Chinook salmon are the largest and most abundant salmonid species that occur in California. Chinook are anadromous, but unlike steelhead, Chinook die after a single spawning event. This evolutionarily significant unit (ESU) spawns in the upper Sacramento River. Chinook salmon are generally thought to exhibit two basic life history patterns; the stream-type and the ocean-type. Winter-run Chinook exhibit a "stream-type" life history dependent on year-round, cool, freshwater habitat for both adults and juveniles, which regularly spend more than a year in rivers before out-migration to the Pacific Ocean (Williams, 2006). Winter-run Chinook typically migrate from the ocean into the freshwater environment in early to late winter. Spawning occurs within a few days or weeks of arrival at the spawning grounds. They migrate upstream before reaching sexual maturity during the spring and summer months. Hatched juveniles reside in spawning streams for at least one year before returning to marine habitats. Winter-run Chinook achieve sexual maturity in the freshwater environment.

The riverine habitat on site and the Sacramento River adjacent to the site contain suitable habitat and are listed as critical habitat for this species (USFWS, 2017b).

Chinook Salmon (Oncorhynchus tshawytsha) – Central Valley Spring-Run ESU

FEDERAL STATUS – THREATENED
STATE STATUS –THREATENED

Chinook in the California Central Valley spring-run ESU are a spring-run species. Spring-run Chinook exhibit a "stream-type" life history that is dependent upon year-round, cool, freshwater habitat for both adults (which arrive in spring and mature while over-summering in foothill streams) and juveniles, which regularly spend more than a year in rivers before out-migration (Williams, 2006). Spring-run Chinook typically migrate from the ocean into the freshwater environment in early to late spring in full maturity. This ESU spawns in the Sacramento River and several of its tributaries. Spawning occurs within a few days or weeks of arrival at the spawning grounds. Spawning occurs in large deep pools in tributaries with moderate velocities and a large bubble curtain at the head. Spring-run spawning and rearing habitat is restricted to the higher elevation portions of the Central Valley where cool summer temperatures can be found in snow melt-fed rivers. Juveniles migrate from spawning grounds to the Pacific Ocean.

The riverine habitat on site and the Sacramento River adjacent to the site contain suitable habitat and are listed as critical habitat for this species (USFWS, 2017b).

Green Sturgeon (Acipenser medirostris) – Southern DPS

FEDERAL STATUS – THREATENED
STATE STATUS – NONE

Green sturgeon use streams, rivers, and estuarine habitat as well as marine waters during their life cycle. This species reaches sexual maturity after 15 years with the southern DPS spawning every 3-4 years primarily in the Sacramento River. Adult green sturgeon generally migrate into rivers between late-February and late-July, and spawning occurs in deep, fast water from March to July. Suitable habitat for spawning includes deep pools with small to medium gravel, cobble, or boulder substrate. Research indicates that water flow is one of the main determinants of successful larval survival (Moyle, 2002).

Water flow and water temperatures between 11-18° C are also important features for spawning and successful embryotic growth. Males can fertilize the eggs of multiple females and post-spawning fish often remain in the Sacramento River until fall or winter. Eggs incubate for approximately 9 days and remain near the hatching area for 18-35 days before dispersing. Juveniles may rear in the river for 1 to 3 years before migrating to the estuary, primarily during the summer and fall. Once in the marine environment, sub-adult and adults will spend most of their life in coastal habitat.
The riverine habitat on site and the Sacramento River adjacent to the site contain suitable habitat and are listed as critical habitat for this species (USFWS, 2017b).

California Red-Legged Frog (Rana draytonii; CRLF)

FEDERAL STATUS – THREATENED
STATE STATUS – SPECIES OF SPECIAL CONCERN

The USFWS formally designated the California red-legged frog (CRLF) as threatened in 1996. The historic range of CRLF extended from the coast of Marin County to the inland area of Redding, Shasta County, southward to northwestern Baja California, Mexico. CRLF requires aquatic breeding areas embedded within a matrix of riparian and upland dispersal habitats. All life history stages are most likely to be encountered in and around coastal lagoons, marshes, springs, permanent and semi-permanent natural ponds, ponded and backwater portions of streams, and artificial impoundments such as stock ponds, irrigation ponds, and siltation ponds.

The breeding period for CRLF is from November to March and the species requires 11 to 30 weeks of permanent water for larval development (USFWS, 2011). Juveniles can occur in slow moving, shallow riffle zones in creeks or along the margins of ponds. Eggs are typically deposited in permanent pools, attached to emergent vegetation (Zeiner et al., 1989). During periods of wet weather, some individuals make nightly overland excursions through upland habitats. CRLF may move up to 1.6 kilometers throughout a wet season (USFWS, 2011). Summer habitat for CRLF include spaces under boulders or rocks and organic debris, such as downed trees or logs; industrial debris; and agricultural features such as drains, watering troughs, abandoned sheds, or hay-ricks (USFWS, 2011).

Potential CRLF upland habitats on site consist of valley oak woodland, valley foothill riparian, foothill pine woodland, and non-native annual grassland. Potential CRLF breeding habitats within the Strawberry Fields Site consist of the two pond features and the riverine area of the Sacramento River. Surveys did not detect CRLF on site. The nearest CNDDB occurrence is approximately 34 miles from the Strawberry Fields Site, and was observed in 1986 (CDFW, 2017b).

Foothill Yellow-legged Frog (Rana boylii; FYLF)

FEDERAL STATUS – NONE
STATE STATUS – CANDIDATE THREATENED, SPECIES OF SPECIAL CONCERN

Foothill yellow-legged frog (FYLF) is named for its abdomen and hind legs, which are distinctively yellowish in color. The known range includes most of northern California, west of the Cascades and south along the coast to the San Gabriel Mountains, and south along the western side of the Sierra Nevada Mountains and into Kern County. Preferred habitat consists of open slow-moving perennial streams with rocky or bedrock substrates and small deeper pools. This species can also occur in smaller perennial streams that are partially shaded, rocky streams at low to moderate elevations in areas of chaparral, cismontane woodland, and broadleaf upland forest habitats. FYLF breeds from March through May in pools within perennial streams and attaches its eggs to gravel or rocks at the edges or along the banks.

Potential FYLF upland habitats on site consist of valley oak woodland, valley foothill riparian, foothill pine woodland, and non-native annual grassland. Potential FYLF breeding habitats within the Strawberry Fields Site consist of the two pond features and the riverine area of the Sacramento River, however this species prefers flowing streams with rockier substrate and therefore is unlikely to utilize these areas for breeding. Surveys did not detect FYLF on site. The nearest CNDDB occurrence is approximately 2.75 miles from the Strawberry Fields Site, and was observed in 1911 (CDFW, 2017b). The closest occurrence within the past 25 years was recorded in 2016 approximately 6 miles from the Strawberry Fields Site (CDFW, 2017b).

Western Spadefoot Toad (Spea hammondii)

FEDERAL STATUS – NONE
STATE STATUS – SPECIES OF SPECIAL CONCERN

The western spadefoot toad occurs throughout the Central Valley and adjacent foothills (including the Sierra foothills). It also occurs in the Southern Coast Range from Santa Barbara County to the Mexican border. This species primarily inhabits lowlands, including such features as washes, floodplains of rivers, alluvial fans, playas, and alkali flats. The toad is almost completely terrestrial, entering water only to breed. Preferred upland areas often contain short grasses, where soil is sandy or gravelly. It can be found in valley and foothill grasslands, open chaparral, and pine-oak woodlands. Though some surface activity may occur in any month between October and April, it typically becomes surface-active following relatively warm rains in late winter-spring and fall. The western spadefoot toad breeds in temporary pools, such as vernal pools, or pools in ephemeral waterways. In order for young to successfully

metamorphose, breeding pools must lack exotic predators, such as fishes, bullfrogs, and crayfishes. Breeding occurs between January and May (Stebbins, 2003).

Suitable habitat exists on site within the riparian and riverine areas, woodlands, non-native annual grasslands, and aquatic features. This species was not observed during surveys. The nearest CNDDB occurrence is approximately 15 miles from the Strawberry Fields Site, and was observed in 2014 (CDFW, 2017b).

Tricolored Blackbird (Agelaius tricolor)

FEDERAL STATUS – NONE
STATE STATUS – ENDANGERED

The tricolored blackbird is largely found in the Central Valley, extending into the south coast range from Monterey County south, but populations are also documented from the Peninsular Range near San Diego County and extreme northern California. The tricolored blackbird forms the largest breeding colonies of any North American land bird, with a primary breeding season extending from March through early August, although they have been observed to breed from September through November. The largest breeding colonies are associated with freshwater emergent wetlands in rice growing communities. However, they are tied to areas with open accessible water, protected nesting vegetation, and adequate foraging habitat within a few kilometers of their breeding colony. Typical nesting substrate consists of tule, cattail, willow, and blackberry, although they have been observed utilizing other species as well. During the winter tricolored blackbird form large mixed-flock with other blackbird species wherein they forage in agricultural fields and grasslands (Wilson et al, 2016).

Suitable nesting habitat exists on site within the woodland habitats and aquatic features, and suitable foraging habitat occurs within the non-native annual grassland. The nearest CNDDB occurrence is approximately 8.5 miles from the Strawberry Fields Site, and was observed in 2005 (CDFW, 2017b). This species was not observed during surveys.

Bald Eagle (Haliaeetus leucocephalus)

FEDERAL STATUS – NONE
STATE STATUS – ENDANGERED

In 1995, the USFWS amended the bald eagle from federally-endangered to threatened in the contiguous 48 states, excluding Michigan, Minnesota, Wisconsin, Oregon, and Washington, where it had already been listed as threatened. In 2007, the bald eagle was completely delisted but remained federally-protected by the MBTA and Bald and Golden Eagle Protection Act. In the mid-1970's the USFWS established five recovery programs based on geographical distribution of the species, with California located in the Pacific Recovery Region. In the Pacific Recovery Region, habitat conservation efforts, including laws and management practices at federal, state, and community levels have helped facilitate

bald eagle population increases. Critical habitat for the bald eagle was not designated as part of the Pacific Recovery Plan (60 Federal Register 36000-36010).

Bald eagles typically nest in forested areas, relatively close (usually less than 1.5 miles) to water that offers foraging opportunities. Nests are most often placed in large old growth trees and occasionally on cliff faces, and are often reused from year to year. In California, nesting typically takes place from January 1 through August 15. While fish make up a large portion of the bald eagle's diet, the bird will also feed opportunistically on a variety of mammals, birds, and carrion. The bald eagle is a well-known scavenger, stealing food from conspecifics and Osprey and traveling long distances for dependable carcasses (Buehler, 2000).

Suitable nesting habitat is absent, however potential foraging areas occur throughout the site. Previous surveys observed bald eagles foraging in the area.

Bank Swallow (Riparia riparia)

FEDERAL STATUS – NONE
STATE STATUS – THREATENED

The bank swallow is a migratory passerine bird in the swallow family. In 1989 the bank swallow was State-listed as Threatened. Most bank swallows in California nest along the Sacramento River and its tributaries. Nests are built on vertical, or near-vertical, banks and bluffs in areas along rivers, lakes, and oceans. Bank swallows typically lay 3 to 5 eggs, with peak egg-laying occurring between mid-April and mid-May (Bank Swallow Technical Advisory Committee, 2013). Foraging habitat includes wetlands, open water, grasslands, riparian woodland, orchards, agricultural fields, shrub lands, and upland woodlands.

Suitable nesting habitat exists on site in the riverine areas and the banks of the Sacramento River, and suitable foraging habitat exists on site within the woodland habitats, non-native annual grasslands, and aquatic features. This species was observed during surveys (**Appendix D-3**).

Western Pond Turtle (Actinemys marmorata)

FEDERAL STATUS – NONE
STATE STATUS – SPECIES OF CONCERN

The western pond turtle is found in Pacific-slope drainages up to elevations of approximately 1,450 meters. Western pond turtles are found along ponds, marshes, rivers, streams, and irrigation ditches that typically have muddy or rocky bottom and grow aquatic vegetation. This species requires basking sites such as logs or mats of submergent vegetation. Western pond turtles nest in open, sunny areas with little vegetation. The nest sites average approximately 28 meters from aquatic habitat, but have been found up to 402 meters from water (Jennings and Hayes, 1994). Western pond turtles breed April through August.

Suitable habitat exists on site within the riverine areas and pond features. CNDDB occurrences for this species have not been recorded within 40 miles of the Strawberry Fields Site (CDFW, 2017b). This species was not observed during surveys.

Migratory Birds and Other Birds of Prey

Migratory birds and other birds of prey have the potential to nest throughout the Strawberry Fields Site. Birds, including red-tailed hawk (*Buteo jamaicensi*), western scrub jay (*Aphelocoma californica*), killdeer (*Charadrius vociferus*), great blue heron (*Ardea herodias*), American crow (*Corvus brachyrhynchos*), Canada goose (*Branta canadensis*), Brewer's blackbird (*Euphagus cyanocephalus*), western meadowlark (*Sturnella neglecta*), Northern mockingbird (*Mimus polyglottos*) and other waterfowl species were observed foraging within the Strawberry Fields Site during surveys, and may nest in the area. The nesting season ranges from February 15 through September 15.

Critical Habitat

Designated critical habitat for steelhead (Northern California Distinct Population Segment) and Chinook salmon (Central Valley Spring-Run and Winter-Run) occurs in the Sacramento River adjacent to the Strawberry Fields Site, and in the riverine habitat on site (USFWS, 2017b). The backwater of the riverine habitat provides seasonal habitat for juvenile rearing but does not generally contain the elements necessary for other life-stage uses. Similarly, the floodplain area of the riverine habitat would be inundated only during periods of high water flow. The lateral extent of the critical habitat is defined by the OHWM or, in areas where the OHWM cannot be defined, the lateral extent is defined by the bankfull elevation (33 CFR 329.11).

The Sacramento River is also designated EFH for Chinook salmon and is protected under the MSMA. EFH is defined as those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity. The lateral extent for EFH is the same as the lateral extent for critical habitat, as defined by the OHWM or bankfull elevation (33 CFR 329.11).

3.5.3 OFF-SITE ACCESS IMPROVEMENT AREAS

Access to the Strawberry Fields Site would be provided by either the North Access Improvement Area or a combination of the North Access Improvement Area and South Access Improvement Area. The North Access Improvement Area and South Access Improvement Area would not be taken into federal trust. Biological data and special-status species lists reviewed for the Strawberry Fields Site also apply to both Access Improvement Areas.

Habitat Types

Terrestrial habitat types of the North and South Access Improvement Areas consist of ruderal/developed. Both Access Improvement Areas are predominately paved or altered.

Ruderal/Developed

Developed areas within the North and South Access Improvement Areas include paved roadways, disturbed road shoulders, parking areas, sidewalks, structural developments, and undeveloped or grazing land. Areas around structures were paved or contained ornamental trees or shrubs. Non-native annual grassland species were identified in areas of undeveloped and grazing land and along roadsides and sidewalks, and contained similar ruderal species as those found in the nonnative annual grassland habitat.

Wetlands and Waters of the U.S.

No wetlands or Waters of the U.S. were observed in the Off-site Access Improvement areas. No evidence of hydrophytic vegetation, hydric soils, or wetland hydrology were observed in the areas. A manmade water transport canal that carries water from the Sacramento River intersects the northern portion of the North Access Improvement Area. The canal is controlled by the Anderson-Cottonwood Irrigation District (ACID) under a pre-1914 water right. Manmade features are generally not considered Waters of the U.S. unless built in place of a historic natural water-carrying drainage or feature. The canal was built from surrounding uplands and was not historically part of a natural jurisdictional feature. Thus, the canal is considered non-jurisdictional by the USACE (Roberts, 2017).

Wildlife

No wildlife was observed on the Off-site Access Improvement Areas.

Special-Status Species

Special-status species with the potential to occur on the Off-site Access Improvement Areas are listed in **Table 3.5-3**. Based on biological desktop review and field survey results, the Off-site Access Improvement Areas may provide habitat for two special-status species; species with the potential to occur on the Off-site Access Improvement Areas are further discussed below.

Tricolored Blackbird (Agelaius tricolor)

This species was discussed in **Section 3.5.2**. Poor to marginal foraging habitat exists on site within the grazing and ruderal areas, and suitable nesting habitat is absent. The nearest CNDDB occurrence is approximately 8.5 miles from the Off-site Access Improvement Areas, and was observed in 2005 (CDFW, 2017b). This species was not observed during surveys.

TABLE 3.5-3
POTENTIALLY OCCURRING SPECIAL-STATUS SPECIES ON THE OFF-SITE ACCESS IMPROVEMENT AREAS

Scientific Name Common name	Federal/ State/CRPR	Distribution	Habitat Requirements	Period of Identification	Potential to Occur On Site
PLANTS					
Cryptantha crinita Silky cryptantha	--/--/1B.2	Occurs in Shasta and Tehama counties, California.	Annual herb that requires gravelly streambeds in cismontane woodland, lower montane coniferous forest, riparian forest, riparian woodland, valley and foothill grassland habitat types. Elevation: 61 – 1215 meters.	April - May	**No.** Suitable habitat for this species does not occur on site.
Juncus leiospermus var. leiospermus Red Bluff dwarf rush	--/--/1B.1	Occurs in Butte, Placer, Shasta and Tehama counties, California.	Annual herb found in seasonally moist habitats that include meadows and seeps, vernal pools, and vernally mesic areas within chaparral, cismontane woodland, and valley and foothill grassland. Elevation: 35 – 1250 meters.	March – June	**No.** Suitable habitat for this species does not occur on site.
Legenere limosa Legenere	--/--/1B.1	Known to occur in Alameda, Lake, Monterey, Napa, Placer, Sacramento, Santa Clara, Shasta, San Joaquin, San Mateo, Solano, Sonoma, Stanislaus, Tehama, and Yuba counties.	Found in vernal pools. Elevation: 1 – 880 meters.	April-June	**No.** Suitable habitat for this species does not occur on site.
Orcuttia tenuis Slender Orcutt grass	FT/CE/1B.1	Known from Butte, Lake, Lassen, Modoc, Plumas, Sacramento, Shasta, Siskiyou, and Tehama counties.	Annual herb found in gravelly vernal pools. Elevation: 35 – 1760 meters.	May-October	**No.** Suitable habitat for this species does not occur on site.
ANIMALS					
Invertebrates					
Branchinecta conservatio Conservancy fairy shrimp	FE/--/--	The species is currently known from several disjunct populations: the Vina Plains in Tehama County, south of Chico in Butte County, the Jepson Prairie Preserve and surrounding area in Solano County, Sacramento National Wildlife Refuge in Glenn County, Mapes Ranch west of Modesto, San Luis National Wildlife Refuge and the Haystack Mountain/Yosemite Lake area in Merced County, and two locations on the Los Padres National Forest in Ventura County.	Endemic to vernal pools in the northern two-thirds of the Central Valley.	December-May	**No.** Suitable habitat for this species does not occur on site.

Scientific Name Common name	Federal/ State/CRPR	Distribution	Habitat Requirements	Period of Identification	Potential to Occur On Site
Branchinecta lynchi Vernal pool fairy shrimp	FT/--/--	Vernal pool fairy shrimp are known from a total of 32 populations located in an area extending from Shasta County through most of the length of the Central Valley to Tulare County, and along the central coast range from northern Solano County to Pinnacles in San Benito County. Five additional, disjunctive populations exist near Soda Lake in San Luis Obispo County, in the mountain grasslands of northern Santa Barbara County, on the Santa Rosa Plateau in Riverside County, near Rancho California in Riverside County.	Found in vernal pools in the Central Valley, coast ranges, and a limited number of sites in the Transverse Ranges and Riverside County, California.	December-May	**No.** Suitable habitat for this species does not occur on site.
Desmocerus californicus dimorpha Valley Elderberry Longhorn Beetle (VELB)	FT/--/--	Restricted to the Central Valley from Redding to Bakersfield. Counties include Amador, Butte, Calaveras, Colusa, El Dorado, Fresno, Glenn, Kern, Madera, Mariposa, Merced, Napa, Placer, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Yolo, and Yuba counties; 0-762 meters elevation.	Found in riparian forest communities. Exclusive host plant is elderberry (*Sambucus* species), which must have stems ≥ 1-inch in diameter for the beetle.	Year-round	**No.** Suitable habitat for this species does not occur on site.
Lepidurus packardi Vernal pool tadpole shrimp	FE/--/--	Known from 18 populations in the Central Valley, ranging from east of Redding in Shasta County south to the San Luis National Wildlife Refuge in Merced County, also from a single vernal pool complex on the San Francisco Bay National Wildlife Refuge in the City of Fremont.	Life cycle is within vernal pools and valley foothill grassland swales.	December-May	**No.** Suitable habitat for this species does not occur on site.
Fish					
Hypomesus transpacificus Delta smelt	FT/CT/--	Occurs almost exclusively in the Sacramento-San Joaquin estuary, from the Suisun Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, Solano, and Yolo counties. May also occur in the San Francisco Bay.	Found in estuarine waters. Majority of life span is spent within the freshwater outskirts of the mixing zone (saltwater-freshwater interface) within the Delta.	Consult Agency	**No.** Suitable habitat for this species does not occur on site.
Onorhynchus Salmo mykiss steelhead	FT/--/--	Spawn in the Sacramento and San Joaquin rivers and tributaries before migrating to the Delta and Bay Area.	Found in cool, clear, fast-flowing permanent streams and rivers with riffles and ample cover from riparian vegetation or overhanging banks. Spawning: streams	Consult Agency	**No.** Suitable habitat for this species does not occur on site.

Scientific Name Common name	Federal/ State/CRPR	Distribution	Habitat Requirements	Period of Identification	Potential to Occur On Site
(Northern California Distinct Population Segment)			with pool and riffle complexes. For successful breeding, require cold water and gravelly streambed.		
Oncorhynchus tshawytscha Chinook salmon Central Valley Spring-Run	FT/CT/--	Spawn in the Sacramento river and some of its tributaries. Juveniles migrate from spawning grounds to the Pacific Ocean.	Spawning occurs in large deep pools in tributaries with moderate velocities and a large bubble curtain at the head.	Consult Agency	**No.** Suitable habitat for this species does not occur on site.
Oncorhynchus tshawytscha Chinook salmon Winter-Run, Sacramento River	FE/CE/--	Spawn in the upper Sacramento River. Juveniles migrate from spawning grounds to the Pacific Ocean.	Returns to the Upper Sacramento River in the winter but delay spawning until spring and summer. Juveniles spend 5-9 months in the river and estuary before entering the ocean.	Consult Agency	**No.** Suitable habitat for this species does not occur on site.
Acipenser medirostris Green sturgeon, southern DPS*	FT/--/--	Spawn in Sacramento and Feather Rivers; juveniles rear mainly in the estuary.	Preferred spawning substrate is large cobble, but can range from clean sand to bedrock. Spawn in the mainstem Sacramento River when temperatures are 46 to 60 degrees Fahrenheit.	Consult Agency	**No.** Suitable habitat for this species does not occur on site.
Amphibians					
Rana aurora draytonii California red-legged frog (CRLF)	FT/CSC/--	Known to occur along the Coast from Mendocino County to Baja California, and inland through the northern Sacramento Valley into the foothills of the Sierra Nevada mountains, south to eastern Tulare County, and possibly eastern Kern County. Currently accepted range excludes the Central Valley.	Occurs in permanent and temporary pools of streams, marshes, and ponds with dense grassy and/or shrubby vegetation. Elevations range from 0-1160 meters.	November – March (breeding) June - August (non-breeding)	**No.** Suitable habitat for this species does not occur on site.
Spea hammondii Western spadefoot toad	--/CSC/--	Known to occur from the north end of California's great central valley near Redding, south, east of the Sierras and the deserts, into northwest Baja California.	Prefers open areas with sandy or gravelly soils, in a variety of habitats including mixed woodlands, grasslands, chaparral, sandy washes, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. Rainpools which do not contain bullfrogs, fish, or crayfish are	November-March	**No.** Suitable habitat for this species does not occur on site.

Scientific Name Common name	Federal/ State/CRPR	Distribution	Habitat Requirements	Period of Identification	Potential to Occur On Site
			necessary for breeding. Elevations range from 0-1,200 meters.		
Birds					
Agelaius tricolor Tricolored blackbird	--/CSC/--	California and Baja California, Mexico.	Nests in dense thickets of cattails, tules, willow, blackberry, wild rose, and other tall herbs near fresh water.	All Year	**Unlikely.** Poor to marginal foraging habitat for this species is present on site. This species was not observed during surveys.
Haliaeetus leucocephalus Bald eagle	--/CE/--	Nests in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, Humboldt, and Trinity Counties. Winters throughout most of California.	Found near ocean shorelines, lakes, reservoirs, river systems, and coastal wetlands. Usually less than 2 km to water that offers foraging opportunities. Suitable foraging habitat consists of large bodies of water or rivers with abundant fish and adjacent perching sites such as snags or large trees.	Year-round	**Unlikely.** Poor to marginal foraging habitat for this species is present on site. This species was observed foraging nearby during surveys.
Riparia riparia Bank swallow	--/CT/--	About 50-60 colonies remain along the middle Sacramento River and 15-25 colonies occur along lower Feather River where the rivers meanders still in a mostly natural state. Other colonies persist along the central coast from Monterey to San Mateo counties, and northeastern California in Shasta, Siskiyou, Lassen, Plumas, and Modoc counties.	Colonial nester; nests primarily in riparian scrub, riparian woodland, and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting holes.	All year	**No.** Suitable habitat for this species does not occur on site.
Strix occidentalis caurina Northern spotted owl	FT/--/--	Geographic range extends from British Colombia to northwestern California south to San Francisco. The breeding range includes the Cascade Range, North Coast Ranges, and the Sierra Nevada. Some breeding populations also occur in the Transverse Ranges and Peninsular Ranges.	Resides in mixed conifer, redwood, and Douglas-fir habitats, from sea level up to approximately 2,300 meters. Appear to prefer old-growth forests, but use of managed (previously logged) lands is not uncommon. Owls do not appear to use logged habitat until approximately 60 years after logging unless some larger trees or snags remain after logging. Nesting habitat is a tree or snag cavity, or the broken top of	Year-round	**No.** Suitable habitat for this species does not occur on site.

Scientific Name Common name	Federal/ State/CRPR	Distribution	Habitat Requirements	Period of Identification	Potential to Occur On Site
			a large tree. Requires a nearby, permanent source of water. Foraging habitat consists of any forest habitat with sufficient prey (e.g. flying squirrels, mice, and voles).		
Reptiles					
Emys marmorata Western pond turtle	--/CSC/--	Distribution ranges from Washington to northern Baja California.	Inhabit rivers, streams, lakes, ponds, reservoirs, stock ponds, and permanent wetland habitats with basking sites.	Year-round	**No.** Suitable habitat for this species does not occur on site.

*NOTE: The listing status of green sturgeon and determination of critical habitat are designated by NMFS, and thus this species does not appear on the species lists.
Source: USFWS, 2017a; CDFW, 2017a; CNPS, 2017a; NMFS, 2009.

STATUS CODES

FEDERAL: United States Fish and Wildlife Service
FE Federally Endangered
FT Federally Threatened

STATE: California Department of Fish and Wildlife
CE California Listed Endangered
CT California Listed Threatened
CCT California Candidate Threatened
CSC California Species of Special Concern

OTHER: California Native Plant Society (California Rare Plant Rank [CRPR])
1A Plants Presumed Extinct in California
1B Plants Rare, Threatened, or Endangered in California and Elsewhere
2 Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere

Threat Ranks
0.1 Seriously threatened in California (high degree/immediacy of threat)
0.2 Fairly threatened in California (moderate degree/immediacy of threat)

Bald Eagle (Haliaeetus leucocephalus)

This species was discussed in **Section 3.5.2**. Poor to marginal foraging habitat exists on site within the grazing and ruderal areas, and suitable nesting habitat is absent. This species was observed foraging on the adjacent Strawberry Fields Site during surveys.

Migratory Birds and Other Birds of Prey

Migratory birds and other birds of prey have a low potential and are unlikely to nest within the Off-site Access Improvement Areas due to human disturbance and lack of suitable nesting habitat. However, migratory birds may forage within the Off-site Access Improvement Areas, although foraging habitat is marginal to poor.

Critical Habitat

No designated critical habitat occurs on or adjacent to the Off-site Access Improvement Areas.

3.5.4 ANDERSON SITE

The Anderson Site is located in Shasta County, California, approximately 5 miles southeast of the Strawberry Fields Site. The approximately 55-acre site consists of four tax parcels and is located within the City of Anderson. I-5 runs along the northeast edge, and the remaining vicinity surrounding the site consists primarily of residential suburban neighborhoods (**Figure 2-5**). Oak Street, a small two-lane residential road, bisects two of the parcels to connect the residential areas on either side. The Anderson Site lies on level terrain with an elevation ranging from approximately 125 to 127 meters amsl.

Methodology

Special-status species include those listed as endangered, threatened, or are candidates for listing under the regulations stated in **Section 3.5.1**. Prior to conducting the biological surveys on the Anderson Site, the following information was obtained and reviewed:

- USFWS Official Species List, dated July 27, 2017, of special-status species with the potential to occur on or be affected by projects on the Cottonwood USGS 7.5-minute topographic quad (USFWS, 2017a; **Appendix D-5**);
- CNPS query, dated July 27, 2017, of special-status plant species known to occur on the Cottonwood USGS 7.5-minute topographic quad (CNPS, 2017a; **Appendix D-5**);
- CNDDB query, dated July 27, 2017, of special-status species known to occur on the Cottonwood USGS 7.5-minute topographic quad (CDFW, 2017a; **Appendix D-5**); and
- USFWS NWI map of wetland features on the Anderson Site (USFWS, 2017c).

Biological Surveys

Biological resource surveys were conducted on the Anderson Site on October 18-19, 2016. The purpose of the surveys was to identify biological communities, special-status species, and suitable habitat for special-status species. Species and habitat types were classified using the *Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities* (CDFG, 2000), *Botanical Survey Guidelines of the California Native Plant Society* (CNPS, 2001), and *The Jepson Manual* (Baldwin et al., 2012).

Analysis

The USFWS, CNDDB, and CNPS lists of regionally occurring special-status species are included for reference purposes within **Appendix D-5**. An analysis to determine which special-status species have the potential to occur within the Anderson Site was conducted. The habitat requirements for each species were assessed and compared to the type and quality of habitats observed during the biological surveys. Regionally-occurring species were determined to have no potential to occur on site based on lack of suitable habitat, elevation range, lack of suitable substrate/soils, and/or geographic distribution.

Terrestrial Habitat Types

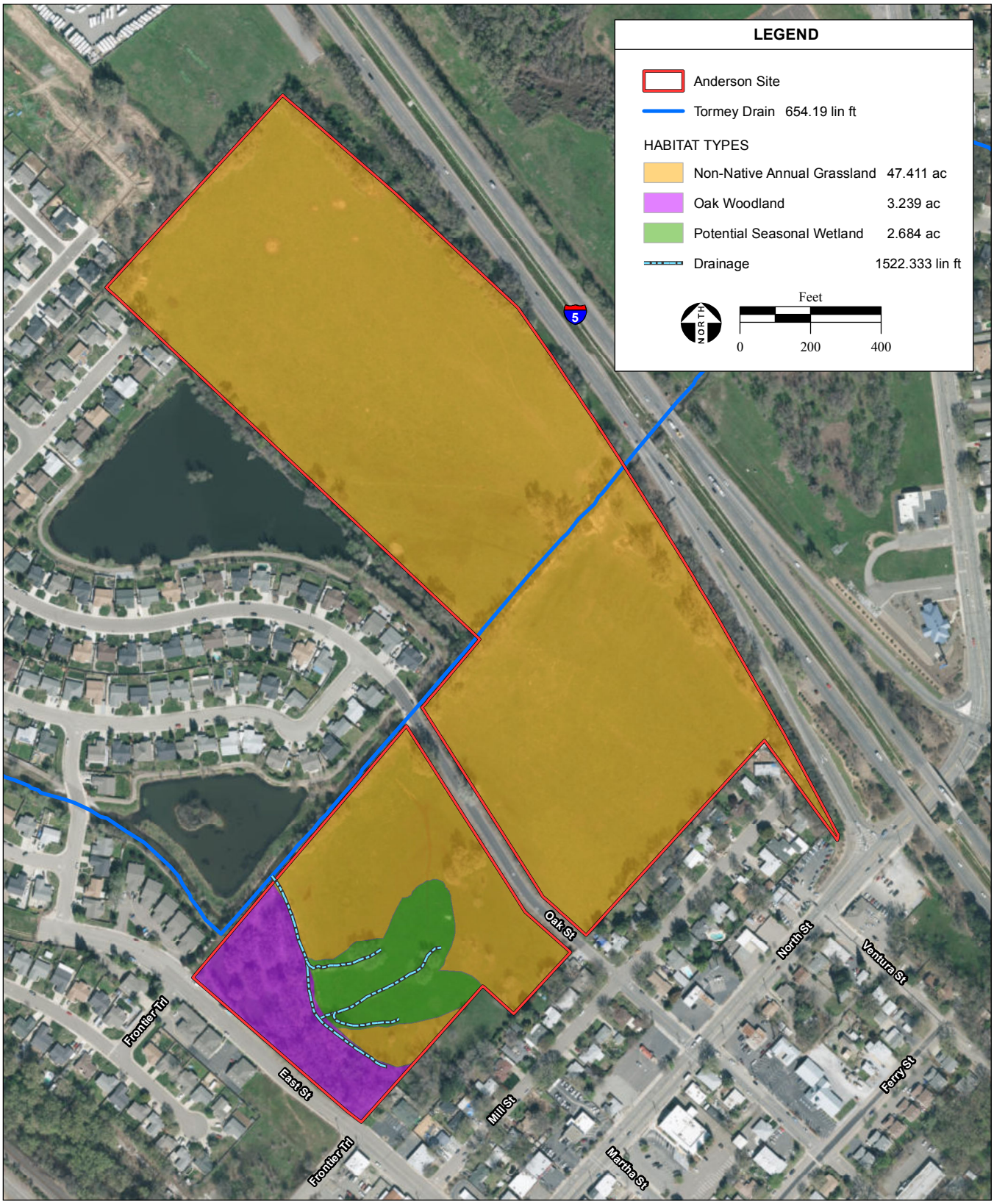
Terrestrial habitat types are shown in **Figure 3.5-3** and **Table 3.5-4**. The site is primarily non-native annual grassland. Photographs of the community types within the Anderson Site are illustrated in **Figure 3.5-4**.

TABLE 3.5-4
SUMMARY OF TERRESTRIAL HABITATS ON THE ANDERSON SITE

Habitat Type	Acres	Percent of Site
Non-native Annual Grassland	47.41	89%
Oak Woodland	3.24	6%
Seasonal Wetland	2.68	5%

Non-native Annual Grassland

The majority of the Anderson Site is composed of actively cattle grazed pasture (**Table 3.5-4**), filled with non-native annual grassland species, dominated by soft chess and ripgut brome. Large patches of invasive non-native Himalayan blackberry occur among the grasses. Additional prevalent vegetation included: wild oat, slender oat, barley, filaree, yellow star-thistle, milk thistle (*Silybum marianum*), field mustard (*Brassica rapa*), English plantain (*Plantago lanceolata*), mouse-hair chickweed (*Cerastium glomeratum*), shepherd's purse (*Capsella bursa-pastoris*), fiddleneck (*Amsinckia menziesii*), and bristly ox-tongue (*Helminthotheca echioides*). The pasture was outlined by a fence with oak species (*Quercus* spps) growing along the fence line.



SOURCE: USDA aerial photograph, 7/26/2014; ESRI Data, 2016; AES, 7/18/2018

Figure 3.5-3
Habitat Types - Anderson Site

PHOTO 1 – Non-native Annual Grassland

PHOTO 2 – Oak Woodland

PHOTO 3 – Drainage Leading to Potential Seasonal Wetland

PHOTO 4 – Confluence of Drainage and USGS Blueline Stream

SOURCE: AES, 7/18/2018

Figure 3.5-4
Anderson Site Photographs

Oak Woodland

Oak woodland habitat can be found in the southwestern portion of the Anderson Site and is dominated by valley oak. While shrub species do not often occur in this habitat, those that were identified include California coffeeberry, Himalayan blackberry, and poison oak. The grassland species that occur in this habitat include black mustard, California poppy, European silver hairgrass, slender oat, rattail fescue, ripgut brome, soft chess, and yellow star-thistle.

Aquatic Habitat Types

The following three aquatic features were identified on the Anderson Site (**Figure 3.5-3**): unnamed blueline stream, drainage, and seasonal wetland.

Tormey Drain

A local street drainage designated as the Tormey Drain bisects the site, and originates in the west-central part of the Anderson Site and drains to the Sacramento River. Approximately 654 linear feet of the Tormey Drain occurs within the Anderson Site.

The Tormey Drain is also identified by USGS as an unnamed blueline stream. Dominant vegetation along banks consists of valley oaks and Himalayan blackberry. Other species present in low abundance included those listed in the non-native annual grassland habitat type.

Seasonal Wetland

A seasonal wetland was identified in the southern portion of the non-native annual grassland. Indicators of wetland hydrology are present, but vegetation communities are not identifiable due to intensive grazing.

Drainages

Several drainages (approximately 1,522 linear feet) were identified with bed, bank, and channel running through the potential seasonal wetland and along the oak woodland habitat. The drainages converge before connecting to the Tormey Drain. At the confluence, high levels of water were observed, likely due to backflow from the Tormey Drain.

Wetlands and Waters of the U.S.

During the site survey, the Anderson Site was informally assessed for the presence of wetlands and waterways. The Tormey Drain, seasonal wetland, and drainages occur on the site (discussed above), and are considered potential Waters of the U.S.

Special-Status Species

Regionally-occurring special-status species and the potential for occurrence on the Anderson Site are listed in **Table 3.5-5**. Based on biological desktop review and field survey results, the Anderson Site may provide habitat for six special-status species; species with the potential to occur on the Anderson Site are further discussed below.

Red Bluff Dwarf Rush (Juncus leiospermus var. leiospermus)

This species was discussed in **Section 3.5.2**. Marginal habitat exists on site within the aquatic features, although occurrence is unlikely. The nearest CNDDB occurrence is approximately 6 miles from the Anderson Site, and was observed in 2006 (CDFW, 2017b). This species was not observed during site surveys, which were conducted during the identifiable bloom season.

California Red-Legged Frog (Rana draytonii)

This species was discussed in **Section 3.5.2**. Potential CRLF upland habitat exists on site within oak woodland and non-native annual grassland. Marginal CRLF breeding habitat exists on site within the drainages and blueline stream. The nearest CNDDB occurrence is approximately 30 miles from the Anderson Site, and was observed in 1986 (CDFW, 2017b). This species was not observed during site surveys.

Western Spadefoot Toad (Spea hammondii)

This species was discussed in **Section 3.5.2**. Suitable habitat exists on site within the oak woodland, non-native annual grasslands, and the blueline stream and drainage features. The nearest CNDDB occurrence is approximately 14 miles from the Anderson Site, and was observed in 2014 (CDFW, 2017b). This species was not observed during surveys.

Tricolored Blackbird (Agelaius tricolor)

This species was discussed in **Section 3.5.2**. Suitable habitat exists on site within the oak woodland and non-native annual grasslands areas. The nearest CNDDB occurrence is approximately 3 miles from the Anderson Site, and was observed in 2014 (CDFW, 2017b). This species was not observed during site surveys.

Bald Eagle (Haliaeetus leucocephalus)

This species was discussed in **Section 3.5.2**. Marginal nesting habitat occurs within the site in the woodland habitat, and marginal foraging habitat occurs throughout the site. This species was not observed during surveys.

TABLE 3.5-5
POTENTIALLY OCCURRING SPECIAL-STATUS SPECIES ON THE ANDERSON SITE

Scientific Name **Common name**	**Federal/ State/CRPR**	**Distribution**	**Habitat Requirements**	**Period of Identification**	**Potential to Occur on Site**
PLANTS					
Cryptantha crinita Silky cryptantha	--/--/1B.2	Occurs in Shasta and Tehama counties, California.	Annual herb requires gravelly streambeds in cismontane woodland, lower montane coniferous forest, riparian forest, riparian woodland, valley and foothill grassland habitat types. Elevation: 61 – 1215 meters.	April - May	**No.** Suitable habitat for this species does not occur on site.
Juncus leiospermus var. leiospermus Red Bluff dwarf rush	--/--/1B.1	Occurs in Butte, Placer, Shasta and Tehama counties, California.	Annual herb found in seasonally moist habitats that include meadows and seeps, vernal pools, and vernally mesic areas within chaparral, cismontane woodland, and valley and foothill grassland. Elevation: 35 – 1250 meters.	March – June	**Yes.** Suitable habitat for this species is present on site. This species was not observed during surveys.
Legenere limosa Legenere	--/--/1B.1	Known to occur in Alameda, Lake, Monterey, Napa, Placer, Sacramento, Santa Clara, Shasta, San Joaquin, San Mateo, Solano, Sonoma, Stanislaus, Tehama, and Yuba counties.	Found in vernal pools. Elevation: 1 – 880 meters.	April-June	**No.** Suitable habitat for this species does not occur on site.
Orcuttia tenuis Slender Orcutt grass	FT/CE/1B.1	Known from Butte, Lake, Lassen, Modoc, Plumas, Sacramento, Shasta, Siskiyou, and Tehama counties.	Annual herb found in gravelly vernal pools. Elevation: 35 – 1760 meters.	May-October	**No.** Suitable habitat for this species does not occur on site.
ANIMALS					
Invertebrates					
Branchinecta conservatio Conservancy fairy shrimp	FT/--/--	The species is currently known from several disjunct populations: the Vina Plains in Tehama County, south of Chico in Butte County, the Jepson Prairie Preserve and surrounding area in Solano County, Sacramento National Wildlife Refuge in Glenn County, Mapes Ranch west of Modesto, San Luis National Wildlife Refuge and the Haystack Mountain/Yosemite Lake area in Merced County, and two locations on the Los Padres National Forest in Ventura County.	Endemic to vernal pools in the northern two-thirds of the Central Valley.	December-May	**No.** Suitable habitat for this species does not occur on site.

Scientific Name **Common name**	**Federal/ State/CRPR**	**Distribution**	**Habitat Requirements**	**Period of Identification**	**Potential to Occur on Site**
Branchinecta lynchi Vernal pool fairy shrimp	FT/--/--	Vernal pool fairy shrimp are known from a total of 32 populations located in an area extending from Shasta County through most of the length of the Central Valley to Tulare County, and along the central coast range from northern Solano County to Pinnacles in San Benito County. Five additional, disjunctive populations exist near Soda Lake in San Luis Obispo County, in the mountain grasslands of northern Santa Barbara County, on the Santa Rosa Plateau in Riverside County, near Rancho California in Riverside County.	Found in vernal pools in the Central Valley, coast ranges, and a limited number of sites in the Transverse Ranges and Riverside County, California.	December-May	**No.** Suitable habitat for this species does not occur on site.
Desmocerus californicus dimorpha Valley Elderberry Longhorn Beetle (VELB)	FT/--/--	Restricted to the Central Valley from Redding to Bakersfield. Counties include Amador, Butte, Calaveras, Colusa, El Dorado, Fresno, Glenn, Kern, Madera, Mariposa, Merced, Napa, Placer, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Yolo, and Yuba counties; 0-762 meters elevation.	Found in riparian forest communities. Exclusive host plant is elderberry (*Sambucus* species), which must have stems ≥ 1-inch in diameter for the beetle.	Year-round	**No.** Suitable habitat for this species does not occur on site.
Lepidurus packardi Vernal pool tadpole shrimp	FE/--/--	Known from 18 populations in the Central Valley, ranging from east of Redding in Shasta County south to the San Luis National Wildlife Refuge in Merced County, also from a single vernal pool complex on the San Francisco Bay National Wildlife Refuge in the City of Fremont.	Life cycle is within vernal pools and valley foothill grassland swales.	December-May	**No.** Suitable habitat for this species does not occur on site.
Fish					
Hypomesus transpacificus Delta smelt	FT/CT/--	Occurs almost exclusively in the Sacramento-San Joaquin estuary, from the Suisun Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, Solano, and Yolo counties. May also occur in the San Francisco Bay.	Found in estuarine waters. Majority of life span is spent within the freshwater outskirts of the mixing zone (saltwater-freshwater interface) within the Delta.	Consult Agency	**No.** The site is not estuarine, and is out of range of this species.

Scientific Name **Common name**	**Federal/ State/CRPR**	**Distribution**	**Habitat Requirements**	**Period of Identification**	**Potential to Occur on Site**
Onorhynchus Salmo mykiss steelhead	FT/--/--	Spawn in the Sacramento and San Joaquin rivers and tributaries before migrating to the Delta and Bay Area.	Found in cool, clear, fast-flowing permanent streams and rivers with riffles and ample cover from riparian vegetation or overhanging banks. Spawning: streams with pool and riffle complexes. For successful breeding, require cold water and gravelly streambed.	Consult Agency	**No.** Suitable habitat for this species does not occur on site.
Oncorhynchus tshawytscha Chinook salmon, Central Valley spring-run	FT/CT/--	Spawn in the Sacramento river and some of its tributaries. Juveniles migrate from spawning grounds to the Pacific Ocean.	Spawning occurs in large deep pools in tributaries with moderate velocities and a large bubble curtain at the head.	Consult Agency	**No.** Suitable habitat for this species does not occur on site.
Oncorhynchus tshawytscha Chinook salmon, winter-run, Sacramento River	FE/CE/--	Spawn in the upper Sacramento River. Juveniles migrate from spawning grounds to the Pacific Ocean.	Returns to the Upper Sacramento River in the winter but delay spawning until spring and summer. Juveniles spend 5-9 months in the river and estuary before entering the ocean.	Consult Agency	**No.** Suitable habitat for this species does not occur on site.
Acipenser medirostris Green sturgeon, southern DPS*	FT/--/--	Spawn in Sacramento and Feather rivers; juveniles rear mainly in the estuary.	Preferred spawning substrate is large cobble, but can range from clean sand to bedrock. Spawn in the mainstem Sacramento River when temperatures are 46 to 60 degrees Fahrenheit.	Consult Agency	**No.** Suitable habitat for this species does not occur on site.
Amphibians					
Rana aurora draytonii California Red-legged Frog (CRLF)	FT/CSC/--	Known to occur along the Coast from Mendocino County to Baja California, and inland through the northern Sacramento Valley into the foothills of the Sierra Nevada mountains, south to eastern Tulare County, and possibly eastern Kern County. Currently accepted range excludes the Central Valley.	Occurs in permanent and temporary pools of streams, marshes, and ponds with dense grassy and/or shrubby vegetation. Elevations range from 0-1160 meters.	November – March (breeding) June - August (non-breeding)	**Yes.** Suitable habitat for this species is present on site. This species was not observed during surveys.
Spea hammondii Western spadefoot toad	--/CSC/--	Known to occur from the north end of California's great central valley near Redding, south, east of the Sierras and the deserts, into northwest Baja California.	Prefers open areas with sandy or gravelly soils, in a variety of habitats including mixed woodlands, grasslands, chaparral, sandy washes, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. Rainpools which do not contain bullfrogs, fish, or crayfish are necessary	November-March	**Yes.** Suitable habitat for this species is present on site. This species was not observed during surveys.

Scientific Name **Common name**	**Federal/ State/CRPR**	**Distribution**	**Habitat Requirements**	**Period of Identification**	**Potential to Occur on Site**
			for breeding. Elevations range from 0-1,200 meters.		
Birds					
Agelaius tricolor Tricolored blackbird	--/CSC/--	California and Baja California, Mexico.	Nests in dense thickets of cattails, tules, willow, blackberry, wild rose, and other tall herbs near fresh water.	All Year	**Yes.** Suitable habitat for this species is present on site. This species was not observed during surveys.
Haliaeetus leucocephalus Bald eagle	--/CE/--	Nests in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, Humboldt, and Trinity Counties. Winters throughout most of California.	Found near ocean shorelines, lakes, reservoirs, river systems, and coastal wetlands. Usually less than 2 km to water that offers foraging opportunities. Suitable foraging habitat often consists of large bodies of water or rivers with abundant fish and adjacent perching sites such as snags or large trees.	Year-round	**Yes.** Suitable habitat for this species is present on site. This species was not observed during surveys.
Riparia riparia Bank swallow	--/CT/--	About 50-60 colonies remain along the middle Sacramento River and 15-25 colonies occur along lower Feather River where the rivers meanders still in a mostly natural state. Other colonies persist along the central coast from Monterey to San Mateo counties, and northeastern California in Shasta, Siskiyou, Lassen, Plumas, and Modoc counties.	Colonial nester; nests primarily in riparian scrub, riparian woodland, and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting holes.	All year	**No.** Suitable habitat for this species does not occur on site.
Reptiles					
Mammals					
Lasiurus blossevillii western red bat	--/CSC/--	Occurs from Shasta County to the Mexican border, west of the Sierra Nevada/Cascade crest and deserts.	The winter range includes western lowlands and coastal regions south of San Francisco Bay. Roosting habitat includes forests and woodlands from sea level up through mixed conifer forests. Roosts primarily in trees (less often in shrubs) along the edge of habitats adjacent to streams, fields or urban areas. Foraging habitats occurs in open areas. They may be found in unusual habitats during migration.	Year Round (spring migrations March to May AND autumn migrations September to October)	**Yes.** The species may be present in the woodland habitat on the Anderson Site.

Scientific Name Common name	Federal/ State/CRPR	Distribution	Habitat Requirements	Period of Identification	Potential to Occur on Site

*NOTE: The listing status of green sturgeon and determination of critical habitat are designated by NMFS, and thus this species does not appear on the species lists.
Source: USFWS, 2017a; CDFW, 2017a; CNPS, 2017a; NMFS, 2009.

STATUS CODES

FEDERAL: United States Fish and Wildlife Service

FE Federally Endangered
FT Federally Threatened

STATE: California Department of Fish and Wildlife

CE California Listed Endangered
CT California Listed Threatened
CCT California Candidate Threatened
CSC California Species of Special Concern

OTHER: California Native Plant Society (California Rare Plant Rank [CRPR])

1A Plants Presumed Extinct in California
1B Plants Rare, Threatened, or Endangered in California and Elsewhere
2 Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere

Threat Ranks

0.1 Seriously threatened in California (high degree/immediacy of threat)
0.2 Fairly threatened in California (moderate degree/immediacy of threat)

Western Red Bat (Lasiurus blossevillii)

FEDERAL STATUS – NONE
STATE STATUS – SPECIES OF CONCERN

The western red bat is found throughout California, west of the Sierra Nevada and Cascade crest and deserts, from Shasta County south to Mexico. This species roosts in forests and woodlands from sea level to mixed conifer forests. Roosts are commonly solitary in trees near streams, fields, or urban areas. Edges or habitat mosaics with water are the most suitable habitats. In California, the western red bat will migrate short distances between summer and winter ranges and can be found in unusual habitats during this time (Pierson et al, 2006). Hibernation takes place during the coolest months when temperatures drop below 68° F. Young are born from late May through early July.

Suitable habitat exists on site within the oak woodland area The nearest CNDDB occurrence is approximately 15 miles from the Anderson Site, and was observed in 1999 (CDFW, 2017b). This species was not observed during surveys.

Migratory Birds and Other Birds of Prey

While no actively nesting birds were observed during the site visit, migratory birds and other birds of prey have the potential to nest within the non-native annual grassland, oak woodland, or along the creek's edge of the Anderson Site. The western scrub jay, American crow (*Corvus brachyrhynchos*), Brewer's blackbird (*Euphagus cyanocephalus*), western meadowlark (*Sturnella neglecta*), Northern mockingbird (*Mimus polyglottos*) and other migratory species were observed foraging within the Anderson Site during the survey and may nest in the area. These and other migratory birds may breed on site during the nesting season (February through September).

Critical Habitat

No designated critical habitat occurs on or adjacent to the Anderson Site.

3.5.5 WIN-RIVER CASINO SITE

The Win-River Casino Site is located in the City, approximately 2.5 miles southwest of the Strawberry Fields Site. The approximately 14.8-acre site has been previously developed and currently houses the Tribe's existing Win-River Casino. The site is entirely paved and surrounded by Clear Creek to the north and west, State Route 273 (SR-273) to the east, and the Anderson-Cottonwood Canal to the south. Elevations on the Win-River Casino Site range from approximately 464 to 470 feet amsl.

Methodology

Special-status species include those listed as endangered, threatened, or are candidates for listing under the federal regulations stated in **Section 3.5.1**. The following information for the Win-River Casino Site was obtained and reviewed:

- USFWS Official Species List, dated July 27, 2017, of special-status species with the potential to occur on or be affected by projects on the Redding USGS 7.5-minute topographic quad (USFWS, 2017a; **Appendix D-5**);
- CNPS query, dated July 27, 2017, of special-status plant species known to occur on the Redding USGS 7.5-minute topographic quad (CNPS, 2017a; **Appendix D-5**);
- CNDDB query, dated July 27, 2017, of special-status species known to occur on the Redding USGS 7.5-minute topographic quad (CDFW, 2017a; **Appendix D-5**); and
- USFWS NWI map of wetland features on the Win-River Casino Site (USFWS, 2017c).

Analysis

The USFWS, CNDDB, and CNPS lists of regionally occurring special-status species are included for reference purposes within **Appendix D-5**. An analysis to determine which special-status species have the potential to occur within the Win-River Casino Site was conducted. The habitat requirements for each species were assessed and compared to the type and quality of habitats present on site. Regionally-occurring species were determined to have no potential to occur on site based on lack of suitable habitat, elevation range, lack of suitable substrate/soils, and/or geographic distribution.

Terrestrial Habitat Types

Ruderal/Developed

The Win-River Casino Site consists of this habitat type, including the paved parking areas with ornamental vegetation and a casino and event center. Species found in this area include those adapted to high disturbance and local vegetation is comprised of non-native annual grassland species such as yellow star-thistle, rattail fescus, black mustard, and winter vetch.

Wetlands and Waters of the U.S.

No wetlands or Waters of the U.S. are present on the Win-River Casino Site. Clear Creek and the Anderson-Cottonwood Canal are adjacent to the site, are listed as USGS blueline streams, and are potential Waters of the U.S.

Special-Status Species

Regionally-occurring special-status species and their potential to occur on the Win-River Casino Site are listed in **Table 3.5-6**. Based on a biological desktop review, no special-status species have the potential to occur on the Win-River Casino Site.

Migratory Birds and Other Birds of Prey

Migratory birds and other birds of prey have the potential to nest within the Win-River Casino Site. Species include the western scrub jay, American crow, Brewer's blackbird, house finch (*Haemorhous mexicanus*), and Northern mockingbird. The nesting season occurs from February 15 through September 15.

Critical Habitat

No designated critical habitat occurs on the Win-River Casino Site.

TABLE 3.5-6
POTENTIALLY OCCURRING SPECIAL-STATUS SPECIES ON THE WIN-RIVER CASINO SITE

Scientific Name **Common name**	**Federal/ State/CRPR**	**Distribution**	**Habitat Requirements**	**Period of Identification**	**Potential to Occur on Site**
PLANTS					
Brodiaea matsonii Sulphur Creek brodiaea	--/--/1B.1	Only known to occur along Sulphur Creek in Shasta County, California.	Perennial bulbiferous herb that requires rocky, metamorphic amphibolites schist in cismontane woodland (streambanks) and meadows and seeps. Elevation: 195 – 215 meters.	May - June	**No.** Suitable habitat for this species does not occur on site.
ANIMALS					
Invertebrates					
Branchinecta lynchi Vernal pool fairy shrimp	FT/--/--	Vernal pool fairy shrimp are known from a total of 32 populations located in an area extending from Shasta County through most of the length of the Central Valley to Tulare County, and along the central coast range from northern Solano County to Pinnacles in San Benito County. Five additional, disjunctive populations exist near Soda Lake in San Luis Obispo County, in the mountain grasslands of northern Santa Barbara County, on the Santa Rosa Plateau in Riverside County, near Rancho California in Riverside County.	Found in vernal pools in the Central Valley, coast ranges, and a limited number of sites in the Transverse Ranges and Riverside County, California.	December-May	**No.** Suitable habitat for this species does not occur on site.
Lepidurus packardi Vernal pool tadpole shrimp	FE/--/--	Known from 18 populations in the Central Valley, ranging from east of Redding in Shasta County south to the San Luis National Wildlife Refuge in Merced County, also from a single vernal pool complex on the San Francisco Bay National Wildlife Refuge in the City of Fremont.	Life cycle is within vernal pools and valley foothill grassland swales.	December-May	**No.** Suitable habitat for this species does not occur on site.
Desmocerus californicus dimorpha Valley Elderberry Longhorn Beetle (VELB)	FT/--/--	Restricted to the Central Valley from Redding to Bakersfield. Counties include Amador, Butte, Calaveras, Colusa, El Dorado, Fresno, Glenn, Kern, Madera, Mariposa, Merced, Napa, Placer, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Yolo, and Yuba counties; 0-762 meters elevation.	Riparian forest communities. Exclusive host plant is elderberry (*Sambucus* species), which must have stems ≥ 1-inch diameter for the beetle.	Year-round	**No.** Suitable habitat for this species does not occur on site.

Scientific Name **Common name**	**Federal/ State/CRPR**	**Distribution**	**Habitat Requirements**	**Period of Identification**	**Potential to Occur on Site**
Fish					
Hypomesus transpacificus Delta smelt	FT/CT/--	Occurs almost exclusively in the Sacramento-San Joaquin estuary, from the Suisun Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, Solano, and Yolo counties. May also occur in the San Francisco Bay.	Estuarine waters. Majority of life span is spent within the freshwater outskirts of the mixing zone (saltwater-freshwater interface) within the Delta.	Consult Agency	**No.** The site is not estuarine, and is out of range of this species.
Oncorhynchus mykiss steelhead Northern California DPS	FT/--/--	Spawn in the Sacramento and San Joaquin rivers and tributaries before migrating to the Delta and Bay Area.	Found in cool, clear, fast-flowing permanent streams and rivers with riffles and ample cover from riparian vegetation or overhanging banks. Spawning: streams with pool and riffle complexes. For successful breeding, require cold water and gravelly streambed.	Consult Agency	**No.** Suitable habitat for this species does not occur on site.
Oncorhynchus tshawytscha Chinook salmon Central Valley spring-run	FT/CT/--	Spawn in the Sacramento river and some of its tributaries. Juveniles migrate from spawning grounds to the Pacific Ocean.	Spawning occurs in large deep pools in tributaries with moderate velocities and a large bubble curtain at the head.	Consult Agency	**No.** Suitable habitat for this species does not occur on site.
Oncorhynchus tshawytscha Chinook salmon winter-run, Sacramento River	FE/CE/--	Spawn in the upper Sacramento River. Juveniles migrate from spawning grounds to the Pacific Ocean.	Returns to the Upper Sacramento River in the winter but delay spawning until spring and summer. Juveniles spend 5-9 months in the river and estuary before entering the ocean.	Consult Agency	**No.** Suitable habitat for this species does not occur on site.
Amphibians					
Rana aurora draytonii California red-legged frog (CRLF)	FT/CSC/--	Known to occur along the Coast from Mendocino County to Baja California, and inland through the northern Sacramento Valley into the foothills of the Sierra Nevada mountains, south to eastern Tulare County, and possibly eastern Kern County. Currently accepted range excludes the Central Valley.	Occurs in permanent and temporary pools of streams, marshes, and ponds with dense grassy and/or shrubby vegetation. Elevations range from 0-1160 meters.	November – March (breeding) June - August (non-breeding)	**No.** Suitable habitat for this species does not occur on site.

Scientific Name **Common name**	**Federal/ State/CRPR**	**Distribution**	**Habitat Requirements**	**Period of Identification**	**Potential to Occur on Site**
Birds					
Agelaius tricolor Tricolored blackbird	--/CSC/--	California and Baja California, Mexico.	Nests in dense thickets of cattails, tules, willow, blackberry, wild rose, and other tall herbs near fresh water.	All Year	**No.** Suitable habitat for this species does not occur on site.
Strix occidentalis caurina Northern spotted owl	FT/--/--	Geographic range extends from British Colombia to northwestern California south to San Francisco. The breeding range includes the Cascade Range, North Coast Ranges, and the Sierra Nevada. Some breeding populations also occur in the Transverse Ranges and Peninsular Ranges.	Resides in mixed conifer, redwood, and Douglas-fir habitats, from sea level up to approximately 2,300 meters. Appear to prefer old-growth forests, but use of managed (previously logged) lands is not uncommon. Owls do not appear to use logged habitat until approximately 60 years after logging unless some larger trees or snags remain after logging. Nesting habitat is a tree or snag cavity, or the broken top of a large tree. Requires a nearby, permanent source of water. Foraging habitat consists of any forest habitat with sufficient prey (e.g. flying squirrels, mice, and voles).	Year-round	**No.** Suitable habitat for this species does not occur on site.
Reptiles					
Emys marmorata Western pond turtle	--/CSC/--	Distribution ranges from Washington to northern Baja California.	Inhabit rivers, streams, lakes, ponds, reservoirs, stock ponds, and permanent wetland habitats with basking sites.	Year-round	**No.** Suitable habitat for this species does not occur on site.
Mammals					
Corynorhinus townsendii Townsend's big-eared bat	--/CCT; CSC/--	Known to occur throughout California, excluding subalpine and alpine habitats. Its range extends through Mexico to British Columbia and the Rocky Mountain states. Also occurs in several regions of the central Appalachians.	Requires caves, mines, tunnels, buildings, or other cave analog structures such as hallowed out redwoods for roosting. Hibernation sites must be cold, but above freezing.	Year-round	**No.** Suitable habitat for this species does not occur on site.

Scientific Name Common name	Federal/ State/CRPR	Distribution	Habitat Requirements	Period of Identification	Potential to Occur on Site

Source: USFWS, 2017a; CDFW, 2017a; CNPS, 2017a.

STATUS CODES

FEDERAL: United States Fish and Wildlife Service

FE Federally Endangered
FT Federally Threatened

STATE: California Department of Fish and Wildlife

CE California Listed Endangered
CT California Listed Threatened
CCT California Candidate Threatened
CSC California Species of Special Concern

OTHER: California Native Plant Society (California Rare Plant Rank [CRPR])

1A Plants Presumed Extinct in California
1B Plants Rare, Threatened, or Endangered in California and Elsewhere
2 Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere

Threat Ranks

0.1 Seriously threatened in California (high degree/immediacy of threat)
0.2 Fairly threatened in California (moderate degree/immediacy of threat)

3.6 CULTURAL AND PALEONTOLOGICAL RESOURCES

This section describes the existing cultural and paleontological conditions for the alternative sites described in **Section 2.2**. The general and site-specific description of cultural resources contained herein provides the environmental baseline by which direct, indirect, and cumulative environmental effects are identified and measured in **Section 4.6**, **Section 4.14**, and **Section 4.15**, respectively. This section is based on four separate studies, three of which focus on the Strawberry Fields Site (AES, 2016a; AES, 2016b; Crawford, 2007), and one that focuses on the Off-site Access Improvement Areas into the Strawberry Fields Site (AES, 2017).

3.6.1 REGULATORY SETTING

National Historic Preservation Act (NHPA)

Section 106 of the National Historic Preservation Act (NHPA) as amended and its implementing regulations found in 36 Code of Federal Regulations (CFR) Part 800, require federal agencies to identify cultural resources that may be affected by actions involving federal lands, funds, or permitting. The Bureau of Indian Affairs (BIA) must comply with Section 106 for the proposed trust acquisition. The significance of the resources must be evaluated using established criteria outlined in 36 CFR 60.4, as described below.

If a resource is determined to be a *historic property*, Section 106 of the NHPA requires that effects of the federal undertaking on the resource be determined. A historic property is defined as:

> *…any prehistoric or historic district, site, building, structure or object included in, or eligible for inclusion in the National Register of Historic Places, including artifacts, records, and material remains related to such a property… (NHPA Sec. 301[5])*

Section 106 of the NHPA prescribes specific criteria for determining whether a project would adversely affect a historic property, as defined in 36 CFR 800.5. An impact is considered adverse when prehistoric or historic archaeological sites, structures, or objects that are listed on or eligible for listing, in the National Register of Historic Places (NRHP) are subjected to the following:

- physical destruction of or damage to all or part of the property;
- alteration of a property;
- removal of the property from its historic location;
- change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;
- introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;
- neglect of a property that causes its deterioration; and

- transfer, lease, or sale of the property out of federal control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

If one or more historic properties will be adversely affected, the lead agency must further consult with stakeholders to resolve the effect. The State Historic Preservation Office (SHPO) must be provided an opportunity to review and comment on these measures prior to project implementation.

Section 106 Agreement Documents

Section 106 regulations address the development of a Memorandum of Agreement (MOA) or Programmatic Agreement (PA) only after the federal agency (in this case the BIA), through consultation with the SHPO/Tribal Historic Preservation Officer (THPO), Indian tribes, and other consulting parties (including applicants, local governments, and possibly the Advisory Council on Historic Properties [ACHP]), has completed earlier steps to establish an Area of Potential Effects (APE), identify historic properties, assess the potential effects of its undertaking on them, and determine that its undertaking may adversely affect a historic property.

MOAs are appropriate to record the agreed upon resolution for a specific undertaking with a defined beginning and conclusion, where adverse effects are understood. PAs, on the other hand, are appropriate 1) for multiple or complex federal undertakings where effects to historic properties cannot be fully determined in advance, 2) for federal agency programs, 3) for routine management activities by an agency, or 4) to tailor the standard Section 106 process to better fit in with agency management or decision making.

PAs generally fall into two types: "project Pas" and "program PAs." There are occasions where completing the Section 106 process prior to making a final decision on a particular undertaking is not practical. The regulations allow an agency to pursue a "project PA" (36 CFR § 800.14[b][3]), rather than an MOA under certain circumstances. The most common situation where a project PA may be appropriate is when, prior to approving the undertaking, the federal agency cannot fully determine how a particular undertaking may affect historic properties or the location of historic properties and their significance and character. For instance, the agency may be required by law to make a final decision on an undertaking within a timeframe that simply cannot accommodate the standard Section 106 process, particularly when the undertaking's APE encompasses large areas of land or when the undertaking may consist of multiple activities that could adversely affect historic properties.

National Register of Historic Places

The eligibility of a resource for listing in the NRHP is determined by evaluating the resource using criteria defined in 36 CFR §60.4 as follows:

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, association, and

A. That are associated with events that have made a significant contribution to the broad patterns of our history;
B. That are associated with the lives of persons significant in our past;
C. 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; or
D. That have yielded, or may be likely to yield, information important to prehistory or history.

Sites younger than 50 years, unless of exceptional importance, are not eligible for listing in the NRHP. In addition to meeting at least one of the criteria listed above, the property must also retain enough integrity to enable it to convey its historic significance. The National Register recognizes seven aspects or qualities that, in various combinations, define integrity. To retain historic integrity, a property will always possess several, and usually most, of the seven aspects of integrity listed above.

While most historic buildings and many historic archaeological properties are significant because of their association with important events, people, or styles (criteria A, B, and C), the significance of most prehistoric and some historic-period archaeological properties is usually assessed under criterion D. This criterion stresses the importance of the information contained in an archaeological site, rather than its intrinsic value as a surviving example of a type or its historical association with an important person or event. It places importance not on physical appearance but rather on information potential.

Native American Graves Protection and Repatriation Act (NAGPRA)

The Native American Graves Protection and Repatriation Act (NAGPRA), 25 United States Code (USC) 3001 *et seq.*, provides a process for museums and federal agencies to return Native American cultural items – human remains, funerary objects, sacred objects, or objects of cultural patrimony – to lineal descendants, and culturally affiliated Indian tribes and Native Hawaiian organizations. NAGPRA includes provisions for unclaimed and culturally unidentifiable Native American cultural items, intentional and inadvertent discovery of Native American cultural items on Federal and Tribal lands, and penalties for noncompliance and illegal trafficking.

Archaeological Resources Protection Act of 1979 (ARPA)

The Archaeological Resources Protection Act of 1979 (ARPA; PL 96-95; 16 USC 470aa-mm), provides for the protection of archaeological resources and sites which are on public and Indian lands, and fosters

increased cooperation and exchange of information between governmental authorities, the professional archaeological community, and private individuals having collections of archaeological resources and data which were obtained before October 31, 1979. ARPA also provides for penalties for noncompliance and illegal trafficking.

National Environmental Policy Act (NEPA)

The National Environmental Policy Act (NEPA) requires that federal agencies take all practical measures to "preserve important historic, cultural, and natural aspects of our national heritage." NEPA's mandate for considering the impacts of a federal project on important historic and cultural resources is similar to that of Section 106 of the NHPA, and the two processes are generally coordinated when applicable. Section 800.8(a) of NHPA's implementing regulations provides guidance on coordination with NEPA.

Antiquities Act of 1906

The Antiquities Act provided for the creation of national monuments and historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest on federal land, including paleontological specimens. Fossils are important resources, due to their scientific and educational value.

Additional provisions appear in the Archaeological and Historic Data Preservation Act of 1974, as amended, for the survey, recovery, and preservation of significant scientific, prehistoric, historic, archaeological, or paleontological data, in such cases wherein this type of data might be otherwise destroyed or irrecoverably lost as a result of federal projects.

Paleontological Resources Preservation Act

The Paleontological Resources Preservation subtitle of the Omnibus Public Land Management Act, 16 USC 470aaa to aaa-11 requires the United States Department of Agriculture (USDA) and the United States Department of the Interior to issue implementation regulations to provide for the preservation, management, and protection of paleontological resources on Federal lands, and insure that these resources are available for current and future generations to enjoy as part of America's national heritage.

Paleontological resources are defined as the traces or remains of prehistoric plants and animals. Such remains often appear as fossilized or petrified skeletal matter, imprints, or endocasts, and reside in sedimentary rock layers. Fossils are important resources, due to their scientific and educational value. Fossil remains of vertebrates are considered significant. Invertebrate fossils are considered significant if they function as index fossils. Index fossils are those that appear in the fossil record for a relatively short and known period of time, allowing geologists to interpret the age range of the geological formations in which they are found.

3.6.2 BACKGROUND RESEARCH

Multiple records searches were completed at the Northeastern Information Center (NEIC) for the alternative sites; the NEIC is the official state repository of archaeological and historic records and reports for Shasta County. The records searches were done to (1) determine whether known cultural resources had been recorded within or adjacent to the project alternative APEs and determine if either the Strawberry Fields or Anderson Sites had been subject to survey in the past; (2) assess the likelihood of unrecorded cultural resources based on archaeological, ethnographic, and historical documents and literature; and (3) to review the distribution of nearby archaeological sites in relation to the environmental setting. These searches include:

- April 12, 2007, for the Strawberry Fields Site (Crawford, 2007);
- February 2, 2016, for the Strawberry Fields Site and Off-site Access Improvement Areas (AES, 2016a); and
- September 16, 2016, for the Anderson Site.

3.6.3 SITE-SPECIFIC CULTURAL STUDIES

Strawberry Fields Site

Background research and an archaeological Phase I survey of the Strawberry Fields Site was completed in 2007 (Crawford, 2007). The 2007 Phase I survey employed pedestrian transects spaced anywhere from 15 to 30 meters apart, reported poor visibility due to star thistle, but identified sparse prehistoric resources around the northern margins of the Strawberry Fields Site, where a dirt track provided better visibility. Because the Strawberry Fields Site consists of a high, well-drained terrace on the bank of the Sacramento River, because prehistoric artifacts were found in 2007, and because of the potential for flood deposit-capped archaeological sites, an Extended Phase I (XP-I) program of subsurface backhoe testing was implemented in March 2016 within the northern and eastern areas of the site proposed for development (AES, 2016a). The XP-I uncovered a buried cultural layer in multiple trenches within the APE (defined as the footprint of the proposed development, including water, wastewater, storm water, and access road facilities), as well as a hearth and other potential cultural features; the finds from 2007 plus the cultural strata uncovered in March 2016 have collectively been assigned a site identification number, CA-SHA-4413.

A Phase II Testing and Evaluation effort was completed in April 2016 (AES, 2016b) in order to evaluate the eligibility of CA-SHA-4413 for listing on the NRHP. A total of 11.88 cubic meters of soil was excavated during the Phase II. Three hearth features, including the one found during the XP-I, a number of Gunther series projectile points, and the results of carbon dating and obsidian hydration studies indicate that CA-SHA-4413 was occupied from approximately 750 A.D. to 1060 A.D. The presence of hearth features, but a comparative lack of midden soils and subsistence refuse, indicate minimal use of the site perhaps in support of fishing or other transitory activities. All indicators attribute CA-SHA-4413 to the Shasta Complex, the most common and best-understood archaeological pattern in the Redding area.

A number of research questions could potentially, be addressed if the appropriate materials were recovered from CA-SHA-4413 in appropriate depositional contexts. Those questions centered around various aspects of prehistoric lifeways, including the timing and duration of site occupation, activities on site, and relationships to the surrounding environment. Evidence from the Phase II effort to answer these questions was limited. The features and artifacts found during the Phase II did not offer new information that would add to, change, or significantly alter what is already known about regional prehistory. No activity-specific loci were noted, with the exception of the general concentration of artifacts in the northwest portion of the site, and the presence of the hearth features therein, and the lack of fauna limited any potential to determine seasonality.

The significance of most prehistoric and some historic-period archaeological properties is usually assessed under NRHP Criterion D. This criterion stresses the importance of the information contained in an archaeological site, placing importance not on physical appearance but rather on data potential. Tribal Cultural Resources Manager Jim Hayward and Redding Rancheria tribal members who were present during both the XP-I and Phase II did not feel that CA-SHA-4413 had cultural significance; this coupled with the apparent lack of significant data potential under Criterion D of the NRHP (see preceding paragraph), indicate that CA-SHA-4413 does not possess values that would make it eligible for listing on NRHP.

Off-site Access Improvement Areas

A record search and an intensive archaeological field survey for the Off-site Access Improvement Areas was completed by Analytical Environmental Services (AES) in early 2017. The record search indicated that the bulk of the Off-site Access Improvement Areas had been surveyed previously; however, due to the passage of time, an additional field survey was conducted. The results of the research and surveys are summarized below.

South Access Area

The South Access Area extends along a rural driveway located to the south of the Strawberry Fields Site; at the time of the survey, visibility was poor due to weeds and grasses obscuring the graveled ground surface. No archaeological or historical sites were observed or identified during the NEIC record search, which would be affected by development of the proposed South Access route.

North Access Area

The North Access Area extends along either side of the existing paved Bechelli Lane north of the Strawberry Fields Site. The northern portion of the North Access APE (defined as the footprint of improvements required for the North Access Improvement Area) is entirely paved with road surfaces, sidewalks, and parking areas for various commercial uses near the intersection with Bonnyview Road. The southern portion of the North Access APE includes disturbed road shoulders, parking areas

associated with the Sunnyhill Pump Station, landscaping, and a canal bridge crossing. The results of the record search and pedestrian survey of the North Access APE indicate that one previously recorded cultural resource is located within the APE, CA-SHA-266. This resource has been found beneath paved surfaces within the northern portion of the North Access APE.

Archaeological investigations at CA-SHA-266, the ethnographic village of *Yonotumnosona* or *Paspuisono*, have been ongoing since the 1940s through a combination of amateur, commercial construction, and roadway projects. The various investigations have found house pits, burials, and general midden deposits. Clewett (1975a, 1975b) completed a pedestrian survey, soil acidity testing, and excavated several test units near the northern border of CA-SHA-266. He subdivided the site into "major" and "peripheral" components, defining the "major" site as the midden area on top of the bluff. Clewett characterized the "peripheral" site as a brief, temporary, intensive population spillover extending northward from the main site. Clewett and Sundahl (1980, 1981), of the Shasta College Archaeological Research Facility, completed a major excavation in the central portion of the site as mitigation for the construction of the Eagle Court building located in the southwest quadrant of the Bonnyview Road / Bechelli Lane intersection. At the time, the midden area of the site was considered to be 240 meters east-west by 40 meters north-south (7,540 square meters); three burials were found during this effort but left in place. Clewett and Sundahl identified multiple house pits, midden deposits, and copious numbers of artifacts and cooking features.

Jensen (1993a, 1993b) completed a survey for a new I-5/Bonnyview Road intersection east of CA-SHA-266. He suggested that site constituents had been redeposited during the construction of the Eagle Court complex and extension of Bechelli Lane. He believed that these deposits were generally located in the vicinity of the existing Burger King building located southeast of the Bonnyview Road / Bechelli Lane intersection. However, during the course of construction at the Burger King/gas station complex, artifacts and midden were noted that Vaughan associated with the "major" deposit, though at the time the City of Redding contended that the material was actually Jensen's redeposited fill from construction of the Eagle Court building and Bechelli Lane.

In January 2000, Coyote & Fox completed a survey of 11 acres for the Hilton Garden Inn hotel (Vaughan, 2000). Elements of CA-SHA-266 were found within the hotel project footprint, particularly where the hotel and upper (western) parking areas were to be built. Therefore, Vaughan excavated test units to more accurately define the eastern boundary of CA-SHA-266 and found that it overlapped the western parking lot area by 200 feet. Vaughan concluded that these deposits were entirely consistent with other materials already recovered from CA-SHA-266and that further mitigation was not recommended for hotel construction beyond having an archaeologist and Native American monitor present during initial ground disturbance for the hotel project. However, this conclusion was reached prior to the discovery of intact burials during construction of the Hilton Garden Inn parking lot in 2002.

The combination of data recovered from archaeological excavations and the historic record indicate that CA-SHA-266 may have been used periodically from approximately 300 A.D. to the beginning of the 20th century and culturally can be associated with the Shasta Complex. In 1976, the "major" portion of the site was found to be eligible for listing on the NRHP, and that assessment was confirmed in 1997 (AES, 2017).

The bulk of CA-SHA-266 lies west of the northern access improvements APE. While some disturbance likely occurred from the construction of the existing development in the area, including Bechelli Lane, Burger King, the Hilton Garden Inn parking lot, and the Texaco Gas Station, it is clear that intact portions of CA-SHA-266 are located within the APE for the northern access route to the Proposed Project.

Anderson Site

The NEIC completed a record search for the Anderson Site on September 29, 2016, and reported that no prehistoric resources had been recorded within the Anderson Site APE (defined as the footprint of development proposed on the Anderson Site, including water, wastewater, and storm water facilities) or within 0.5 miles, and that no historic sites had been recorded within the APE, but that six had been recorded within 0.5 miles, including: P-45-3756, a Masonic Lodge; CA-SHA-3827H, a ranch grouping including orchards, landscaping, historic refuse, and a well; P-45-3878, a single family residence; P-45-3885, a single family residence; CA-SHA-4474H, a well; and CA-THE-2552H, the Anderson Creek Bridge. The NEIC did indicate that two previous survey efforts had included portions of the Anderson Site APE.

On October 18-19, 2016, AES completed an archaeological survey of the APE utilizing pedestrian transects spaced 15 meters apart. Ground surface visibility was poor to moderate, averaging 20 percent. No cultural resources were identified.

Win-River Casino Site

In 1990, a cultural resources survey was completed for the Win-River Casino Site (Jensen, 1990). The background record search for that project identified only the Bell's Mansion Site, a combination historic and prehistoric site locate several hundred meters north of the casino. At the time of that survey, ground surface visibility was good, at approximately 50 percent. No prehistoric sites were identified. Historic resources, in the form of dredger tailings and recent residential development were noted. That study determined that the dredger tailings did not contain values which would make them eligible for listing on the NRHP. Subsequent construction activities, however, did uncover a burial site at the eastern edge of the current Rancheria, when a parking lot was being built. Construction was immediately halted, the parking lot was redesigned, and the burial site was protected and preserved (Tierra, 2008).

3.6.4 NATIVE AMERICAN COORDINATION

In accordance with Section 106 of the NHPA, letters requesting a check of the Sacred Lands File for the Strawberry Fields Site were sent to the California Native American Heritage Commission (NAHC) in 2007 and again in 2016. The NAHC responded indicating that they have no record of sacred lands within the alternative site areas. The NAHC also supplied a list of Native American individuals and groups who may have additional information about cultural resources in the three project areas. In accordance with the consultation requirements of the NHPA 36 CFR §800, these individuals and groups were contacted in both 2007 (by letter) and 2016 (by letter and telephone [**Appendix E**]). In 2007, a reply from Mr. Robert Burns of the Wintu Educational and Cultural Council stated that agricultural workers [at the Strawberry Fields Site] had in the past found projectile points, some of which were reburied, some removed. He also indicated that the northwest corner the Strawberry Fields Site contained an unrecorded site, which appears to be the same (CA-SHA-4413) found during backhoe trenching in March 2016.

Tribal Councilman Jason Hart was present during much of the XP-I backhoe trenching project. During the Phase II testing and evaluation excavations, Councilman Hart, Tribal Cultural Resources Manager Jim Hayward, and other members of the Tribe were periodically present to monitor and observe excavations and findings. In 2016, Mr. Robert Burns contacted both the Wintu Tribe of Northern California (Wintu) and the NAHC regarding the presence of an archaeological site, which was the resource being evaluated by AES. This led to telephone calls from both Greg Bergin, Cultural Resource Manager for Wintu and Katie Sanchez of the NAHC. The specifics of the project were given to both via telephone, including the fact that the Tribe was providing monitors for the archaeological efforts.

On March 30, 2017, AES received a telephone call from Lori Light, the new Cultural Resources Manager for the Wintu; she stated that the Strawberry Fields Site was located in Wintu territory and that Wintu should provide Native American monitors. She was also apprised of the situation, including the fact that the archaeological testing program had been completed in the spring of 2016. She asked for copies of the cultural report, the Environmental Impact Statement (EIS), and the name of the BIA contact; the name of Dan Hall, BIA Regional Archaeologist, was emailed to her on April 3, 2017. Her requests were noted for future reference and compliance.

3.6.5 PALEONTOLOGICAL RESOURCES

A search of the on-line database of the University of California Museum of Paleontology (UCMP, 2016) failed to identify any paleontological resources in the vicinity of the alternative site APEs. However, fossils have been identified within similar environments within California. Therefore, there is the potential for unreported subsurface paleontological resources to be present on the alternative sites.

3.7 SOCIOECONOMIC CONDITIONS

This section describes the existing socioeconomic conditions of the Redding Rancheria (Tribe), the alternative sites described in **Section 2.2**, and surrounding regions. The general and site-specific profiles of socioeconomic conditions contained herein provide the environmental baseline by which direct, indirect, and cumulative environmental effects are identified and measured in **Section 4.7**, **Section 4.14**, and **Section 4.15**, respectively.

3.7.1 REGIONAL SOCIOECONOMIC CHARACTERISTICS

Population

In 2015, the population of Shasta County was 179,533; the population of the City of Redding (City) was 91,582; and the population of the City of Anderson was 10,217. Between 2010 and 2015, the County's population increased approximately 1.3 percent relative to its 2010 population of 177,223. The City's population increased approximately 1.9 percent compared to its 2010 population of 89,86l; while the City of Anderson's population increased approximately 2.9 percent from its 2010 population of 9,932 (**Table 3.7-1**).

TABLE 3.7-1
REGIONAL POPULATION

Location	Population	
	2010	2015
Shasta County	177,223	179,533
City of Redding	89,861	91,582
City of Anderson	9,932	10,217
Source: U.S. Census Bureau, 2016.		

Housing

As shown in **Table 3.7-2**, based on the U.S. Census Bureau's 2011-2015 American Community Survey (ACS) 5-Year Estimates, Shasta County has 77,790 housing units, with a vacancy rate of 10.8 percent. The City has 38,703 total housing units, while the City of Anderson has 4,376 housing, both with a vacancy rate of 8.4 percent.

TABLE 3.7-2
REGIONAL HOUSING STOCK

Location	Total Units	Vacant Units	Vacancy Rate
Shasta County	77,790	8,415	10.8%
City of Redding	38,703	3,267	8.4%
City of Anderson	4,376	369	8.4%
Source: U.S. Census, 2015a.			

Employment

The unemployment rate in August 2017, the most recent estimate available, was approximately 5.1 percent statewide and 6.0 percent for Shasta County, as shown in **Table 3.7-3** (BLS, 2017).

TABLE 3.7-3
EMPLOYMENT DATA

Location	Labor Force	Unemployment Rate	Number of Unemployed
California	19,295,200	5.1%	986,200
Shasta County	76,600	6.0%	4,600
Source: BLS, 2017.			

Income

The U.S. Census Bureau's 2011-2015 ACS 5-Year Estimates is the most current household income dataset available by Census tract. **Figure 3.7-1** shows the Census tracts in the vicinity of the alternative sites. **Table 3.7-4** displays the median household income and poverty income limit for the State of California, Shasta County, the City, the City of Anderson, and each identified Census tract.

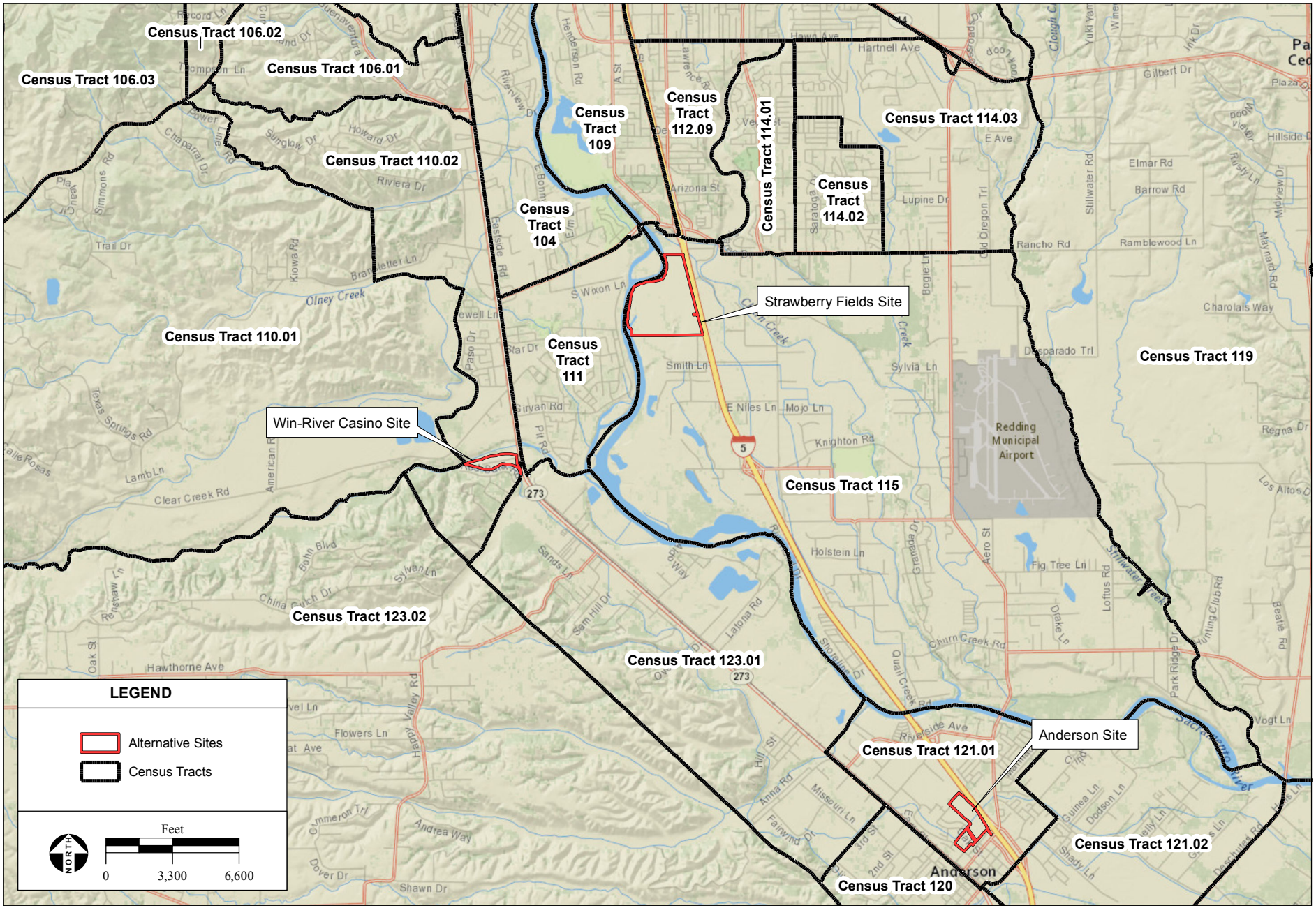
Property Tax

Property tax data for the seven parcels that compose the Strawberry Fields Site and the four parcels that compose the Anderson Site are shown below in **Table 3.7-5**. Because the Win-River Casino Site is tribal land currently held in federal trust for the Tribe, the land is not subject to state or local property tax.

Schools

Throughout Shasta County, there are 25 school districts with over 100 public schools. As of the 2015–2016 school year, public schools in Shasta County have a K-12 enrollment of approximately 26,400 kindergarten through 12th grade students (Figure 59 of **Appendix A**). Since a peak attendance level of approximately 30,400 students in the 2000–2001 school year, enrollment has declined by approximately one percent per year. This trend is anticipated to continue with an average loss of approximately 160 students per year through 2026 (Figure 49 of **Appendix A**).

The vicinity of the Strawberry Fields and Win-River Casino Sites are served by several school districts. Redding School District (RSD) contains currently operates five elementary schools, one middle school, and one K-12 charter school, with a total enrollment of 3,219 students (CDE, 2016). Enterprise Elementary School District operates seven elementary schools and one middle school, with a total enrollment of 3,786 students (CDE, 2016). Shasta Union High School operates four high schools, a continuation high school, and an adult school, with a total enrollment of 5,731 students (CDE, 2016).



SOURCE: U.S. Census, 2010; NatGeo, 2017; AES, 8/11/2017

Figure 3.7-1
Census Tracts

TABLE 3.7-4
HOUSEHOLD INCOME AND POVERTY THRESHOLDS BY GEOGRAPHIC AREA

Geographic Area	Median Household Income	Average Household Size	Poverty Threshold[1]
California State	$61,818	2.96	$20,090
Shasta County	$44,620	2.54	$20,090
City of Redding	$43,341	2.51	$20,090
City of Anderson	$32,536	2.52	$20,090
Alternative Sites Census Tracts			
115 (Strawberry Fields Site)	$49,384	2.58	$20,090
110.02 (Win-River Casino Site)	$42,854	2.57	$20,090
121.01 (Anderson Site)	$40,296	2.52	$20,090
Adjacent Census Tracts			
104	$34,419	2.43	$20,090
106.01	$65,300	2.78	$20,090
106.02	$63,194	2.44	$20,090
106.03	$56,071	2.56	$20,090
109	$34,748	2.25	$20,090
110.01	$70,625	2.72	$20,090
111	$63,939	2.80	$20,090
112.09	$29,625	2.63	$20,090
114.01	$50,330	2.63	$20,090
114.02	$76,905	2.78	$20,090
114.03	$69,103	2.69	$20,090
119	$77,873	2.66	$20,090
120	$31,054	2.57	$20,090
121.02	$26,136	2.23	$20,090
123.01	$32,045	2.62	$20,090
123.02	$55,375	2.69	$20,090

Notes:
1 – For poverty threshold calculations, average household size was conservatively rounded up to the nearest whole number of people.
Source: U.S. Census Bureau, 2015b; HHS, 2015.

The closest school to the Strawberry Fields Site is Redding Community Day School, located approximately 3,200 feet west of the Strawberry Fields Site. The closest school to the Win-River Casino Site is Redding Rancheria Head Start Preschool located adjacent to the Win-River Casino Site approximately 200 feet from the nearest extent of on-site construction.

Both the Cascade Union Elementary School and the Anderson Union High School District serve the vicinity of the Anderson Site. Cascade Union consists of three elementary schools and one middle school, with a total enrollment of 1,080 students (CDE, 2016). Anderson Union consists of five high

schools and one adult school, with a total enrollment of 1,812 students (CDE, 2016). The closest school to the Anderson Site is Ladybug Landing Preschool and Development Center located adjacent to the southern boundary of the Anderson Site.

TABLE 3.7-5
FISCAL YEAR 2017 PROPERTY TAX DATA[1]

Assessor's Parcel Number (APN)	Acreage	Assessed Value	Property Taxes[2]
Strawberry Fields Site			
055-010-011	50.10	$500,000	$5,199
055-010-012	30.00	$300,000	$3,120
055-010-014	15.80	$175,000	$1,821
055-010-015	30.89	$300,000	$3,120
055-020-001	25.10	$250,000	$2,600
055-020-004	75.00	$1,661,783	$17,273
055-020-005	5.00	$79,509	$829
Total	**231.89**	**$3,266,292**	**$33,962**
Anderson Site			
201-720-004	24.50	$980,000	$10,210
201-720-013	17.26	$700,000	$7,299
201-720-014	11.02	$450,000	$4,700
201-730-001	2.50	$142,023	$1,497
Total	**55.28**	**$2,272,023**	**$23,707**

Notes:
1 – Taxes for Fiscal Year (i.e., July 1, 2016 to June 30, 2017)
2 – Rounded to nearest dollar; numbers may therefore not exactly sum
Source: Shasta County Tax Collector, 2017.

Libraries and Parks

The Redding branch of Shasta Public Libraries, located at 1100 Parkview Avenue, is approximately 3.2 miles northwest of the Strawberry Fields Site and 4.6 miles north of the Win-River Casino Site. The Anderson branch of Shasta Public Libraries, located at 3200 West Center Street, is approximately 0.2 miles southwest of the Anderson Site.

The City contains many neighborhood and community parks. The closest parks to the Strawberry Fields Site are Rivercrest Park, located 0.7 miles north of the Strawberry Fields Site, and Cascade Park, located 0.9 miles southwest of the site. Cascade Park is also the closest park to the Win-River Casino Site, located 0.9 miles northeast of the site. Anderson River Park is located 1.6 miles northeast of the Anderson Site. Battle Creek Wildlife Area is located approximately 8.6 miles southeast of the Anderson Site.

Gaming Market

Table 3.7-6 lists existing tribal gaming facilities whose market areas may overlap with the potential market area of the alternative sites, excluding the existing Win-River Casino. As listed in **Table 3.7-6**, gaming operations of five different tribes are located in the market area, with two located within a 50-mile radius of the alternative sites, and two additional facilities within 100 miles of the alternative sites (**Appendix A**). There are also other gaming facilities, such as card clubs, within the market area.

TABLE 3.7-6
COMPETITIVE ENVIRONMENT WITHIN 100 MILES OF THE STRAWBERRY FIELDS SITE

Casino Facility	Ownership	Location	Slots	Within 50-Mile Radius of Strawberry Fields Site?[1]	Distance from Strawberry Fields Site (driving miles)[2]	Distance from Anderson Site (driving miles)[2]	Distance from Win-River Casino Site (driving miles)[1]
Rolling Hills Casino	Paskenta Band of Nomlaki Indians	Corning, CA	840	Yes	48	40	48
Pit River Casino	Pit River Tribe	Burney, CA	145	Yes	55	63	58
Feather Falls Casino & Lodge	Concow-Maidu of Mooretown Rancheria	Oroville, CA	1,000	No	95	87	94
Gold Country Casino & Hotel	Tyme Maidu Tribe of the Berry Creek Rancheria	Oroville, CA	930	No	92	84	92
Colusa Casino Resort	Cachil Dehe Band of Wintun Indians	Colusa, CA	1,000	No	99	92	99

Source:
1 – **Appendix A** (Figure 24)
2 – Estimated by AES

3.7.2 SOCIOECONOMIC CHARACTERISTICS OF REDDING RANCHERIA

Population

The population of the Tribe is summarized below in **Table 3.7-7**. There are 182 adult members of the Tribe, and 156 minors (Redding Rancheria, 2017).

TABLE 3.7-7
REDDING RANCHERIA TRIBAL STATISTICS (2016)

Tribal Enrollment	Total
Total Population	**338**
Ages 0-20	180
Ages 21-40	94
Ages 40-60	49
Ages 60 and older	15
Source: Redding Rancheria, 2017.	

3.7.3 ENVIRONMENTAL JUSTICE

Regulatory Setting

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, directs federal agencies to develop an Environmental Justice Strategy that identifies and addresses disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations. The Council on Environmental Quality (CEQ) has oversight responsibility of the federal government's compliance with EO 12898 and National Environmental Policy Act (NEPA), and, in consultation with the United States Environmental Protection Agency (USEPA) and other agencies, has developed guidance to ensure environmental justice concerns are effectively identified and addressed.

According to guidance from the CEQ (1997) and USEPA (1998), agencies should consider the composition of the affected area to determine whether minority populations, low-income populations, or Indian tribes are present in the area affected by a proposed action and, if so, whether there may be disproportionately high and adverse environmental effects to those populations. The geographic scale of this analysis is the Census tract. Census tracts are small, relatively permanent statistical subdivisions of a county designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions at the time of establishment. Therefore, statistics of Census tracts provide a more accurate representation of a community's racial and economic composition.

Communities may be considered "minority" if one of the following characteristics apply:

- The cumulative percentage of minorities within a Census tract is greater than 50 percent (primary method of analysis).
- The cumulative percentage of minorities within a Census tract is less than 50 percent, but the percentage of minorities is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (secondary method of analysis).

The following races are considered minorities under EO 12898:

- American Indian or Alaskan Native;
- Asian or Pacific Islander;
- Black, not of Hispanic origin; and
- Hispanic.

Populations of two or more races and populations classified as "other" were also considered to be minority races for the purpose of the environmental justice analysis.

According to USEPA, either the county or the state can be used when considering the scope of the "general population." A definition of "meaningfully greater" is not given by the CEQ or USEPA, although the latter has noted that any affected area that has a percentage of minorities above the state's percentage is a potential minority community and any affected area with a minority percentage double that of the state's is a definite minority community under EO 12898.

Communities may be considered "low-income" if one of the following characteristics applies:

- The median household income for a Census tract is below the poverty line (primary method of analysis); or
- Other indications are present that indicate a low-income community is present within the Census tract (secondary method of analysis).

In most cases, the primary method of analysis will suffice to determine whether a low-income community exists in the affected environment. However, when a Census tract income may be just over the poverty line or where a low-income pocket within the tract appears likely, the secondary method of analysis may be warranted. Other indications of a low-income community under the secondary method of analysis include limited access to health care, overburdened or aged infrastructure, and dependence on subsistence living.

Census tracts analyzed herein include tract 115 (containing the Strawberry Fields Site), tract 110.02 (containing the Win-River Casino Site), and tract 121.01 (containing the Anderson Site), as well as adjacent Census tracts.

Race

The U.S. Census Bureau 2011-2015 ACS 5-Year Estimates provide the most current racial data available by Census tract. The racial composition of the Census tracts is not expected to have changed substantially since the time the data was reported. **Table 3.7-8** displays the population of each minority race by Census tract in the vicinity of the alternative sites.

The State of California has a 61 percent minority population out of over 38 million residents. The minority population percentages in the Census tracts containing the alternative sites are all under 20 percent, which is below the threshold to be considered a minority community for the purposes of this analysis. Adjacent Census tracts vary in minority population percentages, but none of the Census tracts shown in **Table 3.7-8** have minority percentages above 32 percent. Thus, no Census tracts in the vicinity of the alternative sites have been identified as containing substantial minority communities; however, members of the Tribe, regardless of where they reside, are considered a minority population.

TABLE 3.7-8
MINORITY POPULATION STATISTICS

Area (State, County, Census Tract)	Total Population	White (alone)	Black or African American	American Indian or Alaska Native	Asian	Native Hawaiian or Other Pacific Islander	Other Race	Two or More Races	Hispanic or Latino (of any race)	Total Minority Population	Percent Minority
State of California	38,421,464	14,879,258	2,160,795	142,191	5,192,548	139,009	84,477	1,072,500	14,750,686	23,542,206	61.27%
Shasta County	178,942	145,248	1,752	4,011	4,672	380	74	6,421	16,384	33,694	18.83%
City of Redding	91,063	72,076	1,329	1,800	3,692	138	55	3,626	8,347	18,987	20.85%
City of Anderson	10,122	7,959	6	168	129	16	0	403	1,441	2,163	21.37%
Alternative Sites Census Tracts											
115 (Strawberry Fields Site)	5,704	5,100	1	21	132	0	0	311	139	604	10.59%
110.02 (Win-River Casino Site)	5,673	4,666	3	92	0	0	0	292	620	1,007	17.75%
121.01 (Anderson Site)	4,413	3,807	6	58	46	0	0	85	411	606	13.73%
Adjacent Census Tracts											
104	3,910	3,395	28	87	82	0	0	123	195	515	13.17%
106.01	2,698	2,356	34	29	124	0	0	67	88	342	12.68%
106.02	5,545	4,244	83	237	79	38	0	176	688	1,301	23.46%
106.03	1,512	1180	0	148	35	0	19	97	33	332	21.96%
109	4,032	2,781	79	76	142	50	0	455	449	1,251	31.03%
110.01	1,641	1,411	4	19	39	0	0	27	141	230	14.02%
111	3,056	2,508	36	219	51	0	45	89	108	548	17.93%
112.09	5,857	4,059	64	90	795	0	0	169	680	1,798	30.70%
114.01	3,850	3,310	40	61	9	0	0	166	264	540	14.03%
114.02	3,112	2,377	0	35	168	0	0	179	353	735	23.62%
114.03	2,678	2,259	0	0	74	0	0	29	316	419	15.65%
119	4,547	4,006	8	169	63	0	0	123	178	541	11.90%
120	4,621	3,318	0	83	66	16	0	230	908	1,303	28.20%
121.02	1,939	1,585	16	45	46	0	0	91	156	354	18.26%
123.01	3,062	2,125	70	0	0	107	0	74	686	937	30.60%
123.02	5,501	4,853	0	170	24	0	0	119	335	648	11.78%

Source: U.S. Census Bureau, 2015c.

Income

A low-income community is defined as a Census tract where the median household income falls below the poverty limit.

As shown in **Table 3.7-4**, the median household income of each Census tract surveyed in the vicinity of the alternative sites was greater than the poverty threshold. The poverty threshold for each Census tract was determined from the average household size of the Census tract (U.S. Census Bureau, 2015b). The poverty threshold assumes average household size is conservatively rounded up to the nearest person. No communities had a median household income lower than the poverty threshold; therefore, no low-income communities have been identified in the vicinity of the alternative sites.

3.8 TRANSPORTATION/CIRCULATION

This section describes the existing environmental conditions related to transportation and circulation for the alternative sites described in **Section 2.2**. The general and site-specific description of transportation and circulation contained herein provides the environmental baseline by which direct, indirect, and cumulative environmental effects are identified and measured in **Section 4.0**.

3.8.1 LEVEL OF SERVICE STANDARDS

Traffic operations have been quantified through determination of level of service (LOS). Peak hour LOS at critical off-site and driveway intersections was determined using the methodology described in the 2010 Highway Capacity Manual (HCM; TRB, 2010). In accordance with the HCM, intersections are rated between LOS A and F, representing progressively worsening traffic conditions. The LOS at intersections is measured in terms of average delay per vehicle in seconds. LOS thresholds for two-lane highways are based on average travel speed and the percent time spent following based on the segment's classification. LOS on Class I facilities (high-speed roadways, including major intercity routes, primary arterials, and daily commuter routes) is defined in terms of average travel speed as well as percent time-spent-following. Percent time-spent-following is defined as the average percent of total travel time that vehicles must travel in platoons behind slower vehicles due to inability to pass on a two-lane highway. The LOS on Class II facilities (low-speed roadways, including access routes, scenic and recreational routes, and routes through rugged terrain) is based only on the percent time-spent-following. LOS thresholds for multilane highways are based on density measured in passenger cars per mile per lane (pc/mi/ln). The LOS intersection criteria are listed in **Table 3.8-1**, roadway segment criteria in **Table 3.8-2** and **Table 3.8-3**, and freeway facility criteria in **Table 3.8-4**.

TABLE 3.8-1
INTERSECTION LEVEL OF SERVICE CRITERIA

Level of Service	Control Delay (Seconds Delay Per Vehicle)	
	Signalized Intersections	Unsignalized Intersections
A	≤ 10	≤ 10
B	> 10 - 20	> 10 - 15
C	> 20 - 35	> 15 - 25
D	> 35 - 55	> 25 - 35
E	> 55 - 80	> 35 - 50
F	> 80	> 50
Source: Kimley-Horn, 2018 (**Appendix F**); TRB, 2010.		

TABLE 3.8-2
ROADWAY SEGMENT LEVEL OF SERVICE CRITERIA – TWO-LANE

Level of Service	Class I Percent Time Spent Following (%)	Class I Average Travel Speed (mph)	Class II Percent Time Spent Following (%)
A	≤ 35	≥ 55	≤ 40
B	> 35 - 50	> 50 - 55	> 40 - 55
C	> 50 - 65	> 45 - 50	> 55 - 70
D	> 65 - 80	> 40 - 45	> 70 - 85
E	> 80	≤ 40	> 85
Source: Kimley-Horn, 2018 (**Appendix F**); TRB, 2010.			

TABLE 3.8-3
ROADWAY SEGMENT LEVEL OF SERVICE CRITERIA – MULTILANE

Level of Service	Free Flow Speed (mph)	Density (pc/mi/ln)
A	All	> 0 - 11
B	All	> 11 - 18
C	All	> 18 - 26
D	All	> 26 - 35
E	60	> 35 - 40
	55	> 35 - 41
	50	> 35 - 43
	45	> 35 - 45
F (demand exceeds capacity)	60	> 40
	55	> 41
	50	> 43
	45	> 45
Source: Kimley-Horn, 2018 (**Appendix F**); TRB, 2010.		

TABLE 3.8-4
FREEWAY SEGMENT LEVEL OF SERVICE CRITERIA

Level of Service	Basic Segments Density (pc/mi/ln)	Merge/Diverge Segments Density (pc/mi/ln)
A	≤ 11	≤ 10
B	> 11 – 18	> 10 - 20
C	> 18 – 26	> 20 - 28
D	> 26 – 35	> 28 - 35
E	> 35 – 45	> 35
F	> 45	Demand exceeds capacity
Source: Kimley-Horn, 2018 (**Appendix F**); TRB, 2010.		

Consultation

A Traffic Impact Study (TIS) was conducted by Kimley-Horn to address the traffic and transportation effects of the proposed alternatives. The TIS is provided as **Appendix F**. The results serve as a baseline from which the 2025 (buildout year) and 2040 (cumulative year) traffic volume projections are derived (**Section 4.8** and **Section 4.15**). The TIS was prepared based on discussions with, and criteria set forth by, the City of Redding, the City of Anderson, Shasta County, and the California Department of Transportation (Caltrans) on topics including the selection of study roadways and freeway facilities, as well as the analysis methodology, procedures, and assumptions. Traffic analysis was completed using Synchro and VISSIM software at intersections and Highway Capacity Software at roadway and freeway segments. Both of these software platforms are based on HCM methodology.

3.8.2 EXISTING CIRCULATION NETWORK

Roadways in the vicinity of the Strawberry Fields, Anderson, and Win-River Casino Sites are shown in **Figure 3.8-1**, **Figure 3.8-2**, and **Figure 3.8-3** and are described below.

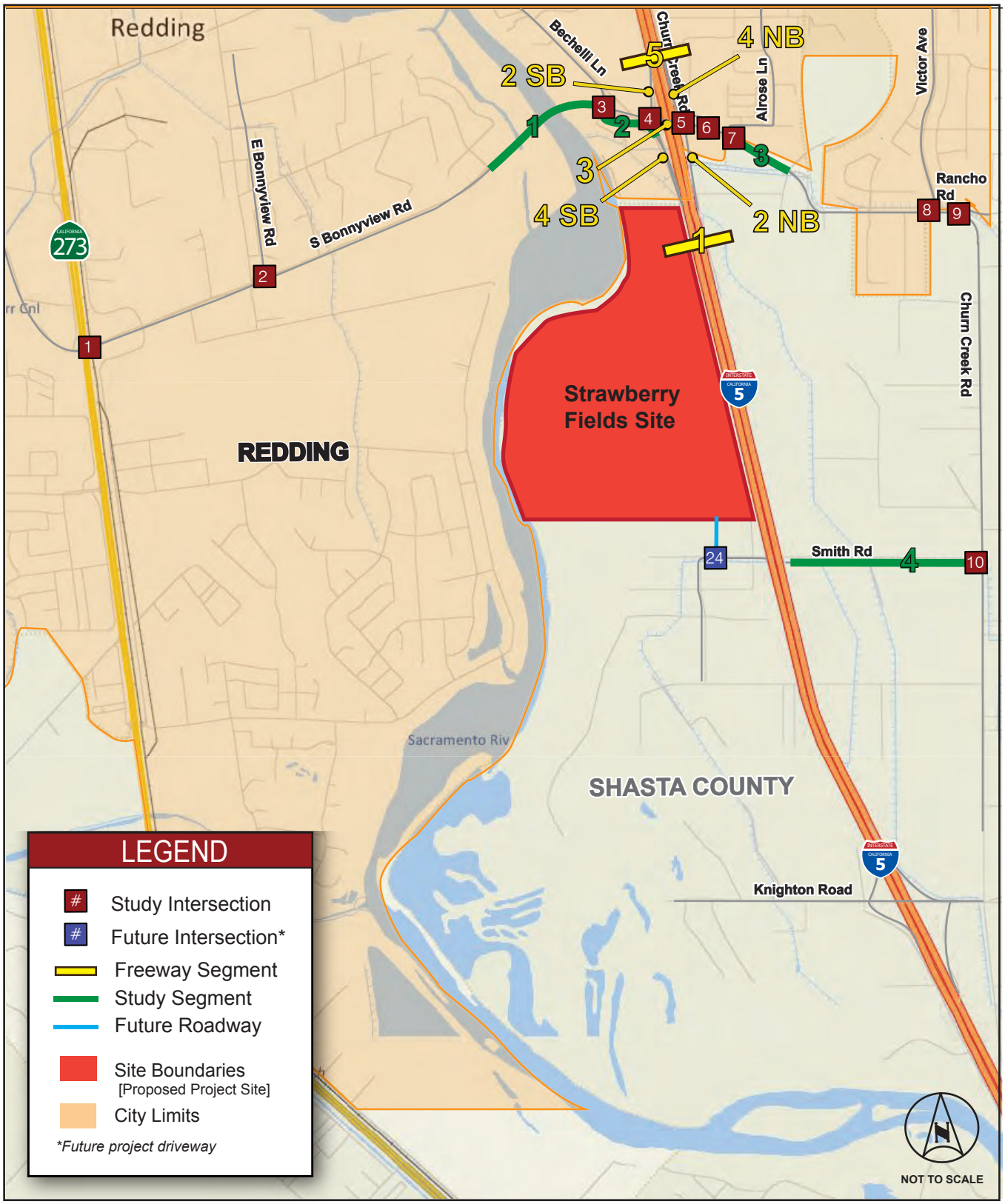
Interstate 5 (I-5) is a major interstate freeway. It runs north-south and connects the cities in northern California and Oregon to the Sacramento Valley in the south. I-5 is also a major truck route, designated as part of the National Surface Transportation Assistance Act (STAA) Network. I-5 runs along the eastern edge of both the Strawberry Fields Site and the Anderson Site. Across the study area, I-5 has a four-lane divided cross section.

Market Street (State Route 273 [SR-273]) is a divided, four-lane expressway, running north-south along the Southern Pacific Railroad tracks. The expressway serves to connect Redding and Anderson, with limited access to adjacent land. SR-273 is designated a terminal access STAA Route. It intersects South Bonnyview Road north of the Win-River Casino Site. All intersections are at grade.

South Bonnyview Road is a two to four lane arterial with curbs and gutters. The road runs east-west, connecting SR-273, I-5, and Churn Creek Road in the vicinity of the Strawberry Fields and Win-River Casino Sites. A class II bike path (refer to **Section 3.8.4** for explanation of bicycle facility classes) runs along the route from SR-273 to I-5. Sidewalks are present from SR-273 to Alrose Lane on the east side of I-5.

East Bonnyview Road is a two lane collector within the City of Redding with curb and gutter on the east side of the roadway. The road runs north-south connecting residential housing to South Bonnyview Road. Sidewalks are present along the east side of the roadway.

Bechelli Lane is a two-lane collector connecting residential housing to Cypress Avenue and South Bonnyview Road. It runs north-south, parallel to I-5. This road provides access to the northern boundary of the Strawberry Fields Site.

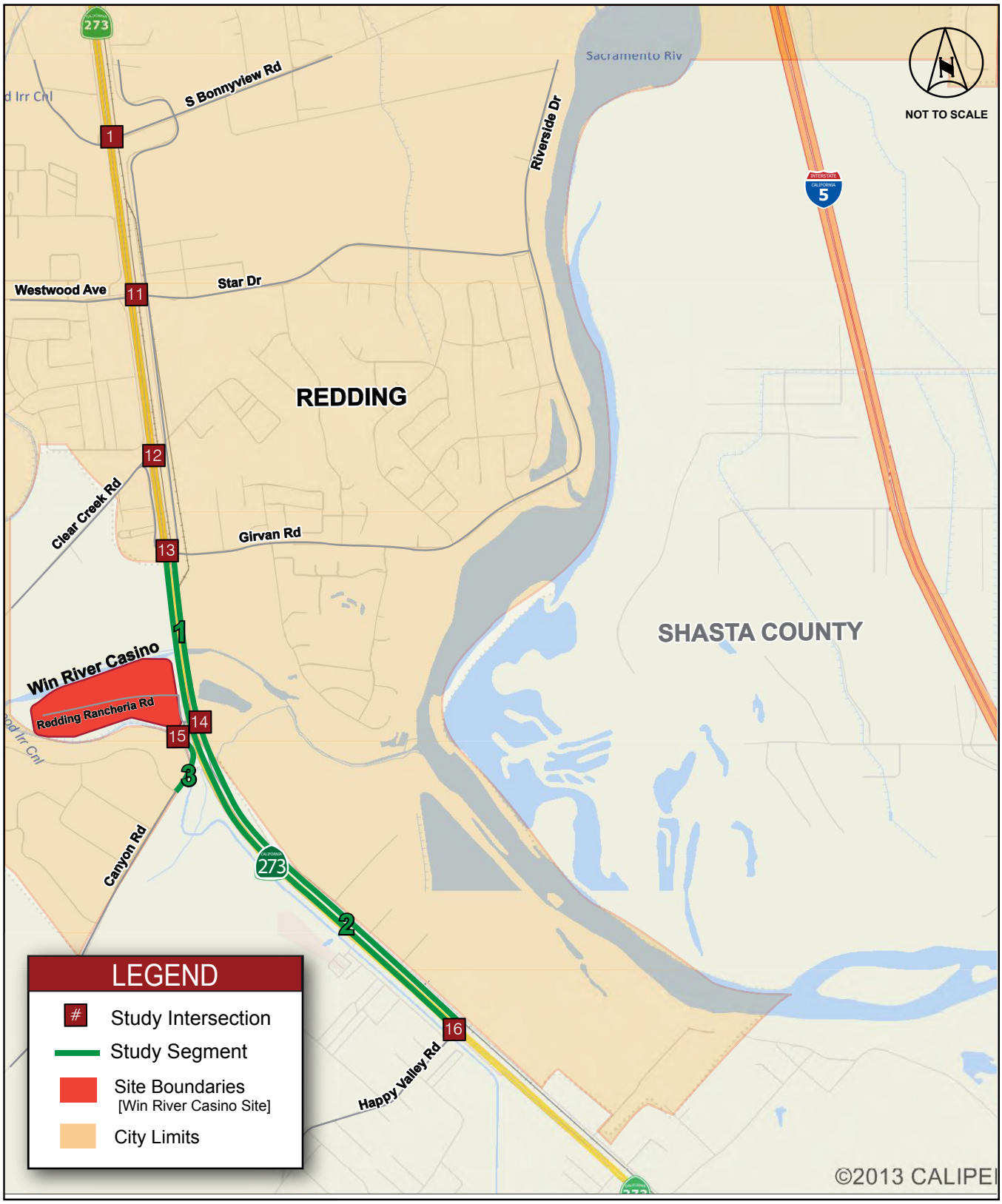


SOURCE: Kimley-Horn, 2017; AES, 8/11/2017

Figure 3.8-1
Strawberry Fields Site Study Area Intersections

SOURCE: Kimley-Horn, 2017; AES, 8/11/2017

Figure 3.8-2
Anderson Site Study Area Intersections



SOURCE: Kimley-Horn, 2017; AES, 8/11/2017

Figure 3.8-3
Win-River Casino Site Study Area Intersections

Churn Creek Road runs north-south from State Route 299 (SR-299) to Knighton Road in the vicinity of the Strawberry Fields Site. North of South Bonnyview Road, Churn Creek Road is a four-lane divided arterial. After the intersection with Bonnyview Road, Churn Creek Road narrows to two lanes and runs east-west for about a mile before continuing south to Airport Road.

Alrose Lane is a two-lane local roadway within the City of Redding. The roadway runs north-south and connects residential housing to Churn Creek Road.

Victor Avenue is a two-lane arterial roadway within the City of Redding. The roadway runs north-south and connects Churn Creek Road with State Route 44 (SR-44) to the north.

Rancho Road is a two-lane arterial roadway within the City of Redding. The roadway runs east-west and connects Churn Creek Road with residential housing to the east.

Smith Road is a two-lane road running east-west from Churn Creek Road to the Sacramento River. This road provides access to the southern boundary of the Strawberry Fields Site via a private drive.

Westwood Avenue is a two-lane local roadway within the City of Redding. The roadway runs east-west and connects SR-273 to residential housing to the west.

Clear Creek Road is a two-lane arterial roadway within the City of Redding. The roadway runs east-west and connects SR-273 to residential housing and businesses to the west.

Girvan Road is a two-lane collector roadway within the City of Redding. The roadway runs east-west and connects SR-273 to residential housing to the east.

Redding Rancheria Road is an undivided, two-lane collector. It joins Canyon Road and intersects SR-273 just east of the Win-River Casino Site. It is the major access point for the existing Win-River Casino and the current Rancheria.

Canyon Road is an undivided, two lane arterial running northeast and southwest. The road extends from SR-273 to Happy Valley Road in the vicinity of the Win-River Casino Site.

North Street is a four-lane arterial running north-south from the Sacramento River to SR-273 in the vicinity of the Anderson Site. This road is a designated Truck Route under the City of Anderson Municipal Code.

Balls Ferry Road is a four-lane arterial roadway running east-west from the I-5 to SR-273.

Oak Street is a two-lane local road running parallel to SR-273, adjacent to the Anderson Site.

McMurray Drive is a two-lane local road running parallel to I-5 within the City of Anderson. The roadway connects the I-5 northbound (NB) ramps.

Ventura Street is a two-lane local road running parallel to I-5 within the City of Anderson. The roadway connects North Street with Balls Ferry Road.

Happy Valley Road is a two-lane arterial running northeast and southwest within Shasta County. The road extends from SR-273 to Canyon Road, continuing south to Gas Point Road.

Intersections

Friday and Saturday intersection turning movement volumes were manually collected in July 2016 at all project study area intersections. Additional intersection turning movement counts were manually collected in September 2016. Volumes were collected during the PM peak period, from 5:00 PM to 7:00 PM on both Friday and Saturday. September traffic counts were higher than July traffic counts, suggesting season variation in the vicinity of the alternative sites. Based on a comparison of the July and September traffic counts, adjustments were applied to the July turning movement counts to proportionally increase volumes to reflect observed seasonal variation.

Additionally, a traffic signal warrant analysis was conducted at unsignalized study intersections to evaluate the potential need for a traffic signal, based on the list of established criteria in the 2014 California Manual on Uniform Traffic Control Devices (MUTCD) to determine the need for a traffic signal at unsignalized intersections.

Strawberry Fields Site

The following intersections in the vicinity of the Strawberry Fields Site and Off-site Access Improvement Areas were evaluated for existing PM peak hour conditions, as well as the potential need for a traffic signal at currently unsignalized intersections:

1. South Bonnyview Road / Market Street (SR-273);
2. South Bonnyview Road / East Bonnyview Road;
3. South Bonnyview Road / Bechelli Lane;
4. South Bonnyview Road / I-5 Southbound (SB) Ramps;
5. South Bonnyview Road / I-5 NB Ramps;
6. South Bonnyview Road / Churn Creek Road;
7. Churn Creek Road / Alrose Lane;
8. Churn Creek Road / Victor Avenue;
9. Churn Creek Road / Rancho Road;
10. Churn Creek Road / Smith Road;
24. Smith Road / Proposed Project South Driveway (Site Access Options 1 and 2);

25. Smith Road / I-5 SB Ramps (Site Access Option 2 only); and
26. Smith Road / I-5 NB Ramps (Site Access Option 2 only).

Anderson Site

The following intersections in the vicinity of the Anderson Site were evaluated for existing PM peak hour conditions, as well as the potential need for a traffic signal at currently unsignalized intersections:

17. Market Street (SR-273) / North Street;
18. North Street / Oak Street;
19. North Street / I-5 SB Off Ramp;
20. North Street / I-5 NB On-Ramp/McMurray Drive;
21. Balls Ferry Road / Oak Street;
22. Balls Ferry Road / I-5 SB On-Ramp/Ventura Street; and
23. Balls Ferry Road / I-5 NB Off-Ramp/McMurray Drive.

Win-River Casino Site

The following intersections in the vicinity of the Win-River Casino Site were evaluated for existing PM peak hour conditions, as well as the potential need for a traffic signal at currently unsignalized intersections:

1. South Bonnyview Road / Market Street (SR-273);
11. Market Street (SR-273) / Westwood Avenue;
12. Market Street (SR-273) / Clear Creek Road;
13. Market Street (SR-273) / Girvan Road;
14. Market Street (SR-273) / Redding Rancheria Road;
15. Redding Rancheria Road / Canyon Road; and
16. Market Street (SR-273) / Happy Valley Road.

Table 3.8-5 presents the existing PM peak hour traffic delays and LOS for each of the above study intersections.

As shown in the tables, all of the study intersections currently operate at acceptable LOS during the Friday and Saturday PM peak hour. However, the North St / I-5 NB On-Ramp (McMurray Dr) intersection currently meets the MUTCD Traffic Signal Warrant #3 (Peak-Hour Volume Warrant) under existing conditions, indicating that installation of a traffic signal should be considered.

TABLE 3.8-5
EXISTING (2016) INTERSECTION LEVEL OF SERVICE SUMMARY

ID	Intersections	Control	LOS Target	Peak Hour	Existing (2016)	
					Delay (sec)	LOS
1	S Bonnyview Rd / Market St (SR-273)	Signal	D	Fri PM	19.6	B
				Sat PM	16.7	B
2	S Bonnyview Rd / E Bonnyview Rd	Signal	D	Fri PM	11.4	B
				Sat PM	5.2	A
3	S Bonnyview Rd / Bechelli Ln	Signal	D	Fri PM	20.4	C
				Sat PM	10.9	B
4	S Bonnyview Rd / I-5 SB Ramps	Signal	D	Fri PM	33.8	C
				Sat PM	25.6	C
5	S Bonnyview Rd / I-5 NB Ramps	Signal	D	Fri PM	30.5	C
				Sat PM	15.5	B
6	S Bonnyview Rd / Churn Creek Rd	Signal	D	Fri PM	15.0	B
				Sat PM	32.3	C
7	Churn Creek Rd / Alrose Ln	SSSC	C	Fri PM	12.7	B
				Sat PM	10.2	B
8	Churn Creek Rd / Victor Ave	SSSC	C	Fri PM	24.5	C
				Sat PM	12.5	B
9	Churn Creek Rd / Rancho Rd	SSSC	C	Fri PM	12.9	B
				Sat PM	10.1	B
10	Churn Creek Rd / Smith Rd	SSSC	C	Fri PM	10.1	B
				Sat PM	9.3	A
11	Market St (SR-273) / Westwood Ave	Signal	D	Fri PM	12.1	B
				Sat PM	9.9	A
12	Market St (SR-273) / Clear Creek Rd	Signal	D	Fri PM	5.9	A
				Sat PM	5.2	A
13	Market St (SR-273) / Girvan Rd	Signal	D	Fri PM	13.8	B
				Sat PM	11.8	B
14	Market St (SR-273) / Redding Rancheria Rd	Signal	D	Fri PM	8.7	A
				Sat PM	7.8	A
15	Canyon Rd / Redding Rancheria Rd	Signal	D	Fri PM	11.6	B
				Sat PM	10.0	B
16	Market St (SR-273) / Happy Valley Rd	Signal	D	Fri PM	7.3	A
				Sat PM	6.4	A
17	Market St (SR-273) / North St	Signal	D	Fri PM	14.9	B
				Sat PM	12.6	B
18	North St / Oak St	SSSC	D	Fri PM	20.8	C
				Sat PM	13.7	B
19	North St / I-5 SB Off-Ramp	AWSC	D	Fri PM	11.7	B
				Sat PM	8.8	A

ID	Intersections	Control	LOS Target	Peak Hour	Existing (2016)	
					Delay (sec)	LOS
20	North St / I-5 NB On-Ramp (McMurray Dr)	AWSC	D	Fri PM	22.6	C
				Sat PM	21.1	C
21	Balls Ferry Rd / Oak St	SSSC	D	Fri PM	13.2	B
				Sat PM	11.5	B
22	Balls Ferry Rd / I-5 SB On-Ramp (Ventura St)	Signal	D	Fri PM	26.6	C
				Sat PM	23.7	C
23	Balls Ferry Rd / I-5 NB Off-Ramp (McMurray Dr)	Signal	D	Fri PM	19.2	B
				Sat PM	17.6	B

Note: All intersections meet current LOS target under existing (2016) conditions.
Source: Kimley-Horn, 2018 (**Appendix F**).

Roadways

Roadways segments are analyzed based on daily roadway traffic volumes and capacity thresholds. The following roadway segments were evaluated for existing PM peak hour conditions:

Strawberry Fields Site

1. South Bonnyview Road west of Bechelli Lane;
2. Bechelli Lane south of South Bonnyview Road;
3. Churn Creek Road east of Alrose Lane; and
4. Smith Road west of Churn Creek Road.

Anderson Site

1. North Street west of Oak Street;
2. Oak Street south of North Street;
3. North Street east of Oak Street; and
4. Oak Street north of North Street.

Win-River Casino Site

1. Market Street (SR-273) north of Redding Rancheria Road;
2. Market Street (SR-273) south of Redding Rancheria Road; and
3. Canyon Road south of Redding Rancheria Road.

Existing daily roadway traffic volumes and capacity thresholds are shown in **Table 3.8-6** and **Table 3.8-7**. As shown in the tables, all study roadway sections currently operate at acceptable levels of service during the Friday and Saturday PM peak hour.

TABLE 3.8-6
EXISTING (2016) ROADWAY SEGMENT LEVEL OF SERVICE SUMMARY – TWO-LANE

Roadway Segment Number[1]	Roadway Segment	Peak Hour	Analysis Direction	LOS	PFFS (%)	v/c
Strawberry Fields Site						
2	Bechelli Ln south of Bonnyview Rd	Fri PM	NB	A	93.8	0.04
			SB	A	93.8	0.02
		Sat PM	NB	A	94.3	0.02
			SB	A	94.3	0.01
3	Churn Creek Rd west of Alrose Ln	Fri PM	EB	C	81.1	0.33
			WB	C	83.0	0.25
		Sat PM	EB	B	85.2	0.19
			WB	B	85.2	0.18
4	Smith Rd west of Churn Creek Rd	Fri PM	EB	A	98.1	0.01
			WB	A	98.1	0.02
		Sat PM	EB	A	94.6	0.01
			WB	A	94.6	0.01
Anderson Site						
1	North St west of Oak St	Fri PM	EB	B	85.6	0.21
			WB	B	85.4	0.25
		Sat PM	EB	B	90.4	0.14
			WB	B	90.4	0.14
2	Oak St south of North St	Fri PM	NB	A	98.2	0.02
			SB	A	98.2	0.02
		Sat PM	NB	A	98.3	0.01
			SB	A	98.3	0.01
3	North St east of Oak St	Fri PM	EB	A	97.4	0.05
			WB	A	97.4	0.04
		Sat PM	EB	A	97.7	0.03
			WB	A	97.7	0.04
4	Oak St north of North St	Fri PM	NB	B	83.9	0.28
			SB	B	84.1	0.25
		Sat PM	NB	B	89.0	0.16
			SB	B	89.0	0.17
Win-River Casino Site						
3	Canyon Rd south of Redding Rancheria Rd	Fri PM	NB	B	85.1	0.15
			SB	B	85.0	0.15
		Sat PM	NB	B	85.1	0.15
			SB	B	84.6	0.24

Notes: 1 – Refer to **Figures 3.8-1**, **3.8-2**, and **3.8-3**.
PFFS = Percent Free-Flow Speed; v/c – Volume to Capacity; NB = northbound; SB = southbound; EB = eastbound; WB = westbound
Source: Kimley-Horn, 2018 (**Appendix F**).

TABLE 3.8-7
EXISTING (2016) ROADWAY SEGMENT LEVEL OF SERVICE SUMMARY – MULTILANE

Roadway Segment Number	Roadway Segment	Peak Hour	Analysis Direction	LOS	Density (pc/mi/ln)
Strawberry Fields Site					
1	Bonnyview Rd west of Bechelli Ln	Fri PM	EB	B	14.2
			WB	B	14.8
		Sat PM	EB	A	8.8
			WB	A	10.2
Win-River Casino Site					
1	Market St (SR-273) north of Canyon Rd	Fri PM	NB	A	6.8
			SB	A	8.4
		Sat PM	NB	A	4.7
			SB	A	5.6
2	Market St (SR-273) south of Canyon Rd	Fri PM	NB	A	4.3
			SB	A	4.9
		Sat PM	NB	A	2.7
			SB	A	2.8

Notes: 1 – Refer to **Figures 3.8-1** and **3.8-3**.
NB = northbound; SB = southbound; EB = eastbound; WB = westbound
Source: Kimley-Horn, 2018 (**Appendix F**).

Freeway Facilities

Freeway facilities analyzed for Friday and Saturday PM peak hour conditions are listed below.

The following five freeway segments near the Strawberry Fields Site and Off-site Access Improvement Areas were selected for evaluation:

1. I-5 south of Bonnyview Road Off-Ramp;
2. Bonnyview Road Off-Ramp;
3. I-5 between Bonnyview Road Off-Ramp and On-Ramp;
4. Bonnyview Road On-Ramp; and
5. I-5 north of Bonnyview Road On-Ramp.

The following five freeway segments near the Anderson Site were selected for evaluation:

1. I-5 south of Balls Ferry Road Off-Ramp;
2. Balls Ferry Road On-Ramp/Off-Ramp;
3. I-5 between Balls Ferry Road Off-Ramp to North Street On-Ramp;
4. North Street On-Ramp/Off-Ramp; and

5. I-5 between North Street On/Off-Ramp to Riverside Ave On/Off-Ramp.

No freeway segments are located in the vicinity of the Win-River Casino; therefore, no freeway segments were evaluated.

As shown in **Table 3.8-8**, all of the study freeway segments currently operate at acceptable LOS during the Friday and Saturday PM peak hour.

TABLE 3.8-8
EXISTING (2016) FREEWAY SEGMENT LEVEL OF SERVICE SUMMARY

I-5					Existing (2016)	
Direction	**Freeway Segment Number[1]**	**Freeway Segment**	**Type**	**Peak Hour**	**Density (pc/mi/ln)**	**LOS**
Strawberry Fields Site						
Northbound	1	South of Bonnyview Rd Off-Ramp	Basic	Fri PM	15.1	B
				Sat PM	10.7	A
	2 NB	Bonnyview Rd. Off-Ramp	Diverge	Fri PM	13.2	B
				Sat PM	10.1	B
	3	Bonnyview Rd Off-Ramp to On-Ramp	Basic	Fri PM	8.3	A
				Sat PM	6.1	A
	4 NB	Bonnyview Rd On-Ramp	Merge	Fri PM	16.5	B
				Sat PM	12.3	B
	5	North of Bonnyview Rd On-Ramp	Basic	Fri PM	11.4	B
				Sat PM	8.2	A
Southbound	5	North of Bonnyview Rd Off-Ramp	Basic	Fri PM	14.0	B
				Sat PM	9.9	A
	2 SB	Bonnyview Rd. Off-Ramp	Diverge	Fri PM	22.4	C
				Sat PM	16.9	B
	3	Bonnyview Rd Off-Ramp to On-Ramp	Basic	Fri PM	10.9	A
				Sat PM	7.9	A
	4 SB	Bonnyview Rd On-Ramp	Merge	Fri PM	18.7	B
				Sat PM	13.4	B
	1	South of Bonnyview Rd On-Ramp	Basic	Fri PM	21.1	C
				Sat PM	13.6	B
Anderson Site						
Northbound	1	South of Balls Ferry Rd Off-Ramp	Basic	Fri PM	17.1	B
				Sat PM	12.9	B
	2 NB	Balls Ferry Rd Off-Ramp	Diverge	Fri PM	20.3	C
				Sat PM	15.3	B
	3	Balls Ferry Rd Off-Ramp to North St On-Ramp	Basic	Fri PM	13.5	B
				Sat PM	10.4	A
	4 NB	North St On-Ramp	Merge	Fri PM	19.1	B
				Sat PM	17.3	B

I-5					Existing (2016)	
Direction	**Freeway Segment Number[1]**	**Freeway Segment**	**Type**	**Peak Hour**	**Density (pc/mi/ln)**	**LOS**
	5	North St On-Ramp to Riverside Ave Off-Ramp	Basic	Fri PM	16.0	B
				Sat PM	12.0	B
Southbound	5	Riverside Ave On-Ramp to North St Off-Ramp	Basic	Fri PM	22.1	C
				Sat PM	15.5	B
	4 SB	North St Off-Ramp	Diverge	Fri PM	27.6	C
				Sat PM	21.9	C
	3	North St Off-Ramp to Balls Ferry Rd On-Ramp	Basic	Fri PM	18.8	C
				Sat PM	13.7	B
	2 SB	Balls Ferry Rd On-Ramp	Merge	Fri PM	25.7	C
				Sat PM	19.4	B
	1	South of Balls Ferry Rd On-Ramp	Basic	Fri PM	22.0	C
				Sat PM	16.0	B

Note: 1 – Refer to **Figures 3.8-1** and **3.8-2**.
Source: Kimley-Horn, 2018 (**Appendix F**).

3.8.3 TRANSIT SERVICES

This section summarizes the existing public and private transit services available in the vicinity of the alternative sites.

Transit service in Redding and Anderson is provided by the Redding Area Bus Authority (RABA). Route 3 and the Anderson Commuter Route serve the SR-273 corridor.

Strawberry Fields Site and Off-site Access Improvement Areas

There are no public transit stops offered in close proximity to the Strawberry Fields Site. RABA Route 3 includes stops along the western portion of South Bonnyview Road, approximately 1.9 miles from the Strawberry Fields Site. The Route 3 transit services operate hourly on weekdays and Saturdays.

Anderson Site

RABA Route 9 provides service within the City of Anderson with stops on North Street, approximately 0.2 miles from the Anderson Site. The Anderson Commuter, which provides service via SR-273 between downtown Anderson and downtown Redding, only operates between select commuting hours (7:00 to 9:00 AM) on weekday mornings.

Win-River Casino Site

The existing Win-River Casino offers a shuttle between the Hilton Garden Inn, located off of Bechelli Lane, and the casino itself. Additionally, RABA Route 3 stops at SR-273 and Canyon Road, which is adjacent to the Win-River Casino Site. This route provides service to downtown Redding.

3.8.4 BICYCLE AND PEDESTRIAN FACILITIES

This section discusses existing bicycle and pedestrian facilities in the vicinity of the alternative sites. For the purposes of this analysis, bicycle routes are classified based on Caltrans methodology, described below.

Class I: A multi-use path that is completely separated from the main roadway and intended for the exclusive use of bicycles and pedestrians with cross-flow minimized. Class I paths are separated from the main roadway is five feet plus standard shoulder widths.

Class II: A striped lane parallel to the car lane on a street or highway. This lane is intended for one-way bike travel. The minimum width for a Class II lane is four feet on roadways with a posted speed limit lower than 40 miles per hour (mph) and six feet on roadways with a posted speed limit of 40 mph or higher.

Class III: A signed, shared roadway that provides for shared use with motor vehicle, bicycle, and pedestrian traffic. Class III routes are typically utilized on low-volume roadways (Caltrans, 2017).

Strawberry Fields Site and Off-site Access Improvement Areas

There are currently no designated bicycle lanes of paths in the vicinity of the Strawberry Fields Site and Off-site Access Improvement Areas. There is a class II bicycle facility along South Bonnyview Road, from SR-273 to Churn Creek Road. There are additional class II facilities extending north on East Bonnyview Road, Bechelli Lane, and Victor Avenue. None of these facilities connect directly to the Strawberry Fields Site. According to the City of Redding Bikeway Action Plan: 2010-2015, bicycle facilities are planned along the Sacramento River adjacent to the Strawberry Fields Site (**Appendix F**; City of Redding, 2010). Sidewalks are present on Bechelli Lane north of the Strawberry Fields Site. No sidewalks exist on Smith Road.

Anderson Site

The Anderson Site is not located in close proximity to any bicycle facilities. However, bicycle access is provided along sections of Market Street (SR-273) and I-5 north and south of the Anderson Site. Bicycle facilities are planned on local roads in the City of Anderson on East Street, North Street, Ventura Street, and Balls Ferry Road in vicinity of the Anderson Site (City of Anderson, 2007). Sidewalks are present on North Street and Oak Street south of Mill Street near the Anderson Site.

Win-River Casino Site

The Win-River Casino Site is located adjacent to SR-273, which allows bicyclists to utilize at least 15 miles of the roadway between the City of Redding and the City of Anderson. Sidewalks are present on both sides of Redding Rancheria Road.

3.8.5 PAVEMENT CONDITIONS

Road maintenance is conducted regularly throughout Shasta County. Major roads are inspected biannually, and all other paved roads are inspected every four years. These inspections help the County prioritize the order in which roads need infrastructure improvements (Shasta County, 2017a). Shasta County road maintenance is funded by the Road Fund, which is paid into primarily by State and federal grants and user fees (Shasta County, 2016c). Each year the County's budget is prepared and roadway improvements are specified. The County plans to improve Deschutes Road, Gas Point Road, and Spring Creek Road at Fall River Bridge in 2017-2018 (Shasta County, 2017b).

The City of Redding has a similar program for maintaining pavement and patching potholes (City of Redding, 2017a). The City of Redding prepares a budget every two years, and road maintenance is paid for by the Gas Tax Street Improvement Fund (City of Redding, 2017b). The City of Redding 2017 to 2019 budget allocated funds for repaving roadways near Sundial Bridge and the Rodeo Grounds, widen Canby Road north of Browning, and other traffic circulation improvements (City of Redding, 2017b).

Similarly, the City of Anderson Public Works Department maintains streets, sidewalks, and traffic signs within the City (City of Anderson, 2017a). The City of Anderson prepares a budget annually, and road maintenance is paid for by the Streets and Roads Fund. The City of Anderson allocates funds for street maintenance by the Public Works Department, including for specific project such as improvements to the I-5 / Riverside Avenue interchange (City of Anderson, 2017b).

There are no current pavement projects in Shasta County in the vicinity of any of the alternative sites or on study area roadways (Shasta County, 2017c).

3.9 LAND USE

This section describes the existing environmental conditions related to land use for the alternative sites described in **Section 2.2**. The general and site-specific description of land use contained herein provides the environmental baseline by which direct, indirect, and cumulative environmental effects are identified and measured in **Sections 4.9**, **4.14**, and **4.15**, respectively.

3.9.1 REGULATORY SETTING

Local Planning Documents

While local land use policies would not apply to lands taken into federal trust, impacts to the community may occur in terms of a federal project's relation to growth and development visions as described in these guidance documents.

Shasta County General Plan

The Shasta County General Plan, amended through September 2004, is a statement of public policy reflecting the aspirations and values of Shasta County residents. The General Plan contains "statements of community values regarding the future growth, development, and quality of life in Shasta County" (Shasta County, 2004). The County General Plan is organized into three sections: Public Safety, Resources, and Community Development. The Shasta County General Plan land use designation for the Strawberry Fields Site is A-cg (Shasta County, 2017d), which means the land is capable of supporting crop production by part-time or second income operators, with minimum parcel sizes of 5, 10, or 20 acres (Shasta County, 2004). **Table 3.9-1** shows applicable General Plan policies.

TABLE 3.9-1
APPLICABLE COUNTY GENERAL PLAN AGRICULTURAL OBJECTIVES AND POLICIES

Objective/Policy	General Plan Text
Objective AG-2	Preservation of agricultural lands at a size capable of supporting part-time or second income, but not full-time, agricultural operations (designated on the land use maps as A-cg) in order to allow the continuation of such uses and to provide opportunities for the future expansion and/or establishment of such uses.
Policy AG-g	Lands designated A-cg shall be maintained to support both short- and long-term part-time agricultural activities as the primary land use while allowing subordinate auxiliary uses, including single family residences. Removal of agricultural soils and other activities which reduce the potential for agricultural production as the primary land use are prohibited.[1]
Policy AG-h	The site planning, design, and construction of on-site and off-site improvements for nonagricultural development in agricultural areas shall avoid unmitigatable short- and long-term adverse impacts on facilities, such as irrigation ditches, used to supply water to agricultural operations.
Notes: 1– County policy AG-g contains exemptions; however, none apply to the Strawberry Fields Site. Source: Shasta County, 2004.	

Shasta County Code of Ordinances

Title 17 (Zoning) of the Shasta County Code of Ordinances is intended to promote and protect the public health, safety, peace, morals, comfort, convenience, and general welfare; to implement the County General Plan, and to facilitate and guide growth in accordance with that plan; and to protect the social and economic stability of residential, commercial, industrial, resource production, and recreational activities within the County through the orderly planned use of the land (Shasta County, 2016a). The code references zone maps, which show the designations and boundaries of each district in the unincorporated County. The County's zoning map identifies the Strawberry Fields Site as mostly A-1, Limited Agriculture, as shown on **Figure 3.9-1** (Shasta County, 2013). This zoning district is intended to preserve agricultural lands at a size capable of supporting part-time agricultural operations (Shasta County, 2016a). The westernmost edge of the Strawberry Fields Site, along the Sacramento River, is zoned F-1, Designated Floodway, which is a zoning district intended to maximize the use of land located within the designated floodway in a manner consistent with the need to protect life and property, and to minimize environmental damage to riparian and aquatic habitats (Shasta County, 2013; Shasta County, 2016a).

City of Redding General Plan

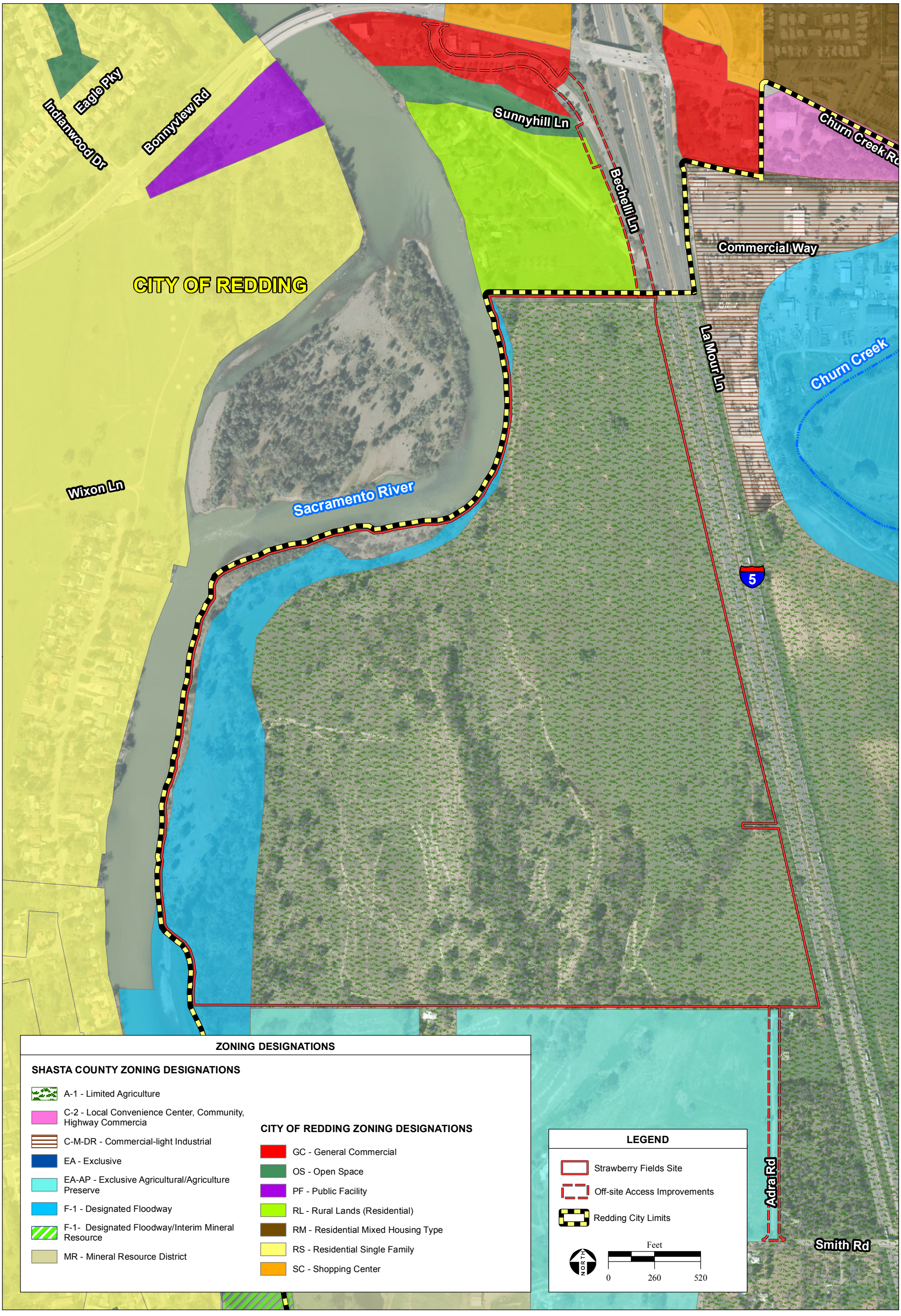
The City of Redding (City) General Plan outlines goals, policies, focus areas, and guidelines for day-to-day decisions concerning the City's development through the year 2020. Although the Strawberry Fields Site is located outside the incorporated boundaries of the City, it falls within the plan boundary area included in the Redding General Plan Community Development and Design Element, but it is not within the City's Sphere of Influence (SOI; City of Redding, 2017d) and is not subject to City land use documents or policy. The North Access Improvement Area, however, is within the City and subject to its General Plan policies. The City Council adopted the Redding General Plan on October 3, 2000 (City of Redding, 2017c). The plan consists of ten elements, including a Community Development and Design element (City of Redding, 2000).

City of Anderson General Plan

The City of Anderson's Council approved its General Plan in 2007. Its stated purpose is to allow for needed growth while protecting the small town characteristics of Anderson (City of Anderson, 2007). The Land Use Element in the Anderson General Plan contains goals and policies to provide guidance for future development. **Table 3.9-2** depicts the City of Anderson's goals and policies that may be relevant to the Anderson Site.

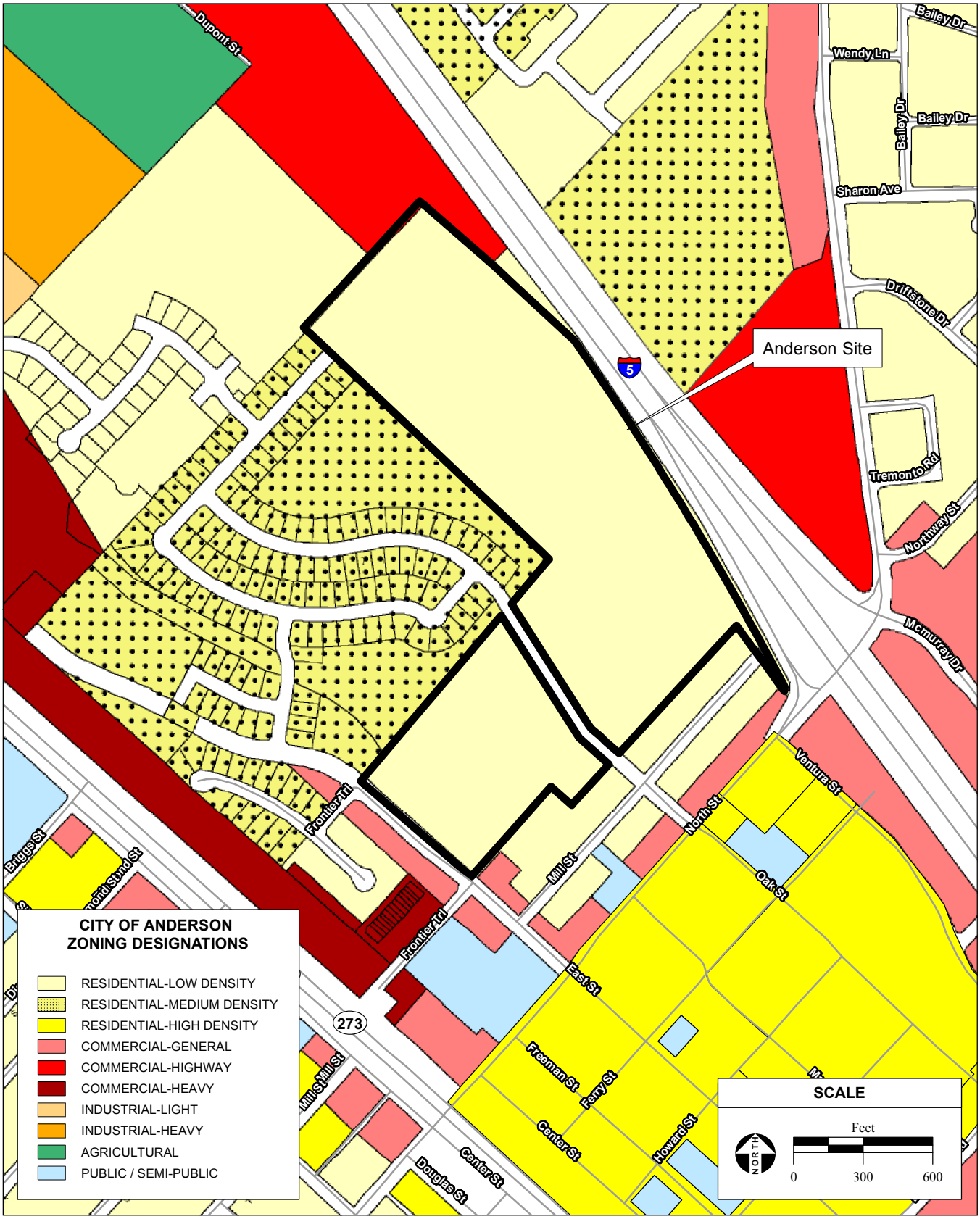
City of Anderson Zoning Ordinance

The Anderson Site and most of the surrounding parcels are currently zoned by the City of Anderson for residential use. The four parcels encompassed by the Anderson Site, as well as several adjacent parcels to the northwest and southeast, are zoned R1 for low-density residential development, as shown on **Figure 3.9-2**. Other adjacent parcels are zoned for higher density residential, commercial, and public/open space uses (City of Anderson, 2005).



SOURCE: City of Redding Zoning, 2007; USDA aerial photograph, 7/26/2014; ESRI Data, 2016; AES, 7/18/2018

Figure 3.9-1
Zoning Designations for the Strawberry Fields Site



SOURCE: City of Anderson, 8/2005; USDA aerial photograph, 7/26/2014; AES, 8/11/2017

Figure 3.9-2
City of Anderson Zoning Designations

TABLE 3.9-2
CITY OF ANDERSON APPLICABLE GENERAL PLAN LAND USE POLICIES

Policies	City of Anderson Planning Policies
GP-2	Promote a combination of employment and residential uses that provide both jobs and housing for Anderson's residents.
GP-6	Assure that all development in the City pays for its fair share of the cost of necessary public services and facilities.
GP-8	Infill development of the vacant areas within the City Limits shall be encouraged in order for the City to provide services to its residents more efficiently.
GP-12	Environmental Justice concepts which encourage public participation from all segments of the community will be followed. Undesirable land uses which cause environmental and health burdens will not be located exclusively near low-income residents.
GI-5	Require buffers (such as landscaping or open space) between uses where appropriate and discourage locating sensitive uses (residential) adjacent to existing potentially objectionable uses or locating potentially objectionable uses adjacent to sensitive uses.
RP-3	Protect existing residential areas from intrusion of incompatible land uses and excessive traffic.
RP-4	In areas where different land uses abut one another, promote land use compatibility by using buffering techniques, landscaping, setbacks, screening, and sound walls.
RP-8	Consider the cumulative effects of development on community facilities and services, such as transportation and schools, throughout the planning process.
CP-3	Commercial development should require high landscaping standards and be integrated with adjacent neighborhood development.
CP-4	Encourage businesses that support and contribute to the economic vitality and diversity of the Anderson community.
CP-5	Promote the location of commercial centers to allow for easy access to streets that serve the City and minimize negative impacts on residential neighborhoods.
CP-6	Promote the location of regional commercial uses on major roads or at major intersections.
CP-8	Neighborhood commercial centers shall be designed to fit into the neighborhood area they serve; with walkable access, compatibility with surrounding uses, and consistent design with a community theme.
Source: City of Anderson, 2007.	

3.9.2 ENVIRONMENTAL SETTING

Strawberry Fields Site

Regional Setting

The Strawberry Fields Site is located within southern Shasta County (County), approximately two miles south of the City, which is itself approximately 100 miles south of the Oregon border and 160 miles north of Sacramento. The Strawberry Fields Site and the City are situated at the far north end of the Sacramento Valley near the Cascade mountain range. The region's most distinct geographical feature is the Sacramento River, which flows through the City in a north-south direction. The City is also bisected by Interstate 5 (I-5), a major north-south freeway that runs from Canada to Mexico (City of Redding, 2000).

Local Land Use Setting

The Strawberry Fields Site is comprised of seven tax parcels and bound by Bechelli Lane to the north, the Sacramento River to the west, adjacent private property to the south, and I-5 to the east. The Strawberry Fields Site is located outside the incorporated boundaries of the City as well as its primary and secondary growth areas (areas either adjacent to developed areas or areas otherwise determined appropriate for future urbanization or annexation to the City), and is located outside City's SOI.

Although primarily zoned for limited agricultural use (except for the designated floodway district along the edge of the Sacramento River), the Strawberry Fields Site is currently undeveloped. Adjacent parcels to the east are zoned by the County as C-M (commercial-light industrial) and A-1 (limited agriculture), while parcels to the south are designated EA-AP (exclusive agricultural/agricultural preserve).The adjacent parcel to the north is zoned by the City as RL (Rural Lands [Residential]). The Strawberry Fields Site has a County land use designation of A-cg.

The site is located south of a local intersection with I-5, and surrounding land uses are generally mixed and include single and multi-family residences, commercial retail shopping centers, industrial and manufacturing facilities, and undeveloped land.

Off-site Access Improvement Areas

The North Access Improvement Area is located within the City. Because this area would not be taken into trust, it would be subject to the previously described provisions in the City General Plan. This improvement area is located north of the Strawberry Fields Site, and encompasses Bechelli Lane and its adjacent right-of-ways between South Bonnyview Road and the northern boundary of the Strawberry Fields Site.

The South Access Improvement Area is located within unincorporated Shasta County. Because this area would not be taken into trust, it would be subject to the previously described provisions in the County General Plan and County ordinances. This improvement area is located south of the Strawberry Fields Site, and encompasses Adra Road and its adjacent right-of-ways between the southern boundary of the Strawberry Fields Site and Smith Road.

Anderson Site

Regional Setting

The Anderson Site is located within the City of Anderson in Shasta County, California, approximately five miles southeast of the Strawberry Fields Site. The City of Anderson is located along the Sacramento River and characterized by a traditional river valley landscape in the north and east that rises into rolling foothills to the south and west.

Local Land Use Setting

The Anderson Site consists of four tax parcels. I-5 runs along the northeast edge of the Anderson Site. Oak Street, a small two-lane residential road, bisects two of the parcels to connect the residential areas to either side of the Anderson Site.

The Anderson Site is zoned for residential development, and surrounding land uses consist primarily of residential suburban neighborhoods.

Win-River Casino Site

Because the Win-River Casino Site has already been taken into trust for the Tribe, local guidance documents such as the County General Plan are not applicable to planned future land uses on the Win-River Casino Site.

3.9.3 AGRICULTURE

The United States Department of Agriculture (USDA) performs a state-by-state census of agriculture every five years. The National Agricultural Statistics Service (NASS) collects census data from a list of all known potential agriculture operators. The census reports on various statistics relating to crop yields, farm acreage, and farm economics. According to the *2012 Census of Agricultural Crop Report,* 376,306 acres (or approximately 15 percent) of the total 2,462,080 acres in Shasta County were used for farming purposes (NASS, 2012). The market value of agricultural products sold by the 1,544 farms in Shasta County in 2012 was approximately $65,622,000 (NASS, 2012).

Federal

Farmland Protection Policy Act (FPPA)

The Farmland Protection Policy Act (FPPA) is intended to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. It assures that federal programs are administered in a manner that is compatible with state and local units of government and private programs and policies to protect farmland.

The Natural Resources Conservation Service (NRCS), an agency of the USDA, fulfills the directives of the Soil and Water Conservation Act by identifying significant areas of concern for the protection of our resources. NRCS uses a land evaluation and site assessment system to establish a Farmland Conversion Impact Rating (FCIR) score. This evaluation is completed on Form AD 1006 (FCIR Form). The FCIR Form has two components: the land evaluation, which rates soil quality up to 100 points, and the site assessment, which measures other factors that affect the farm's viability up to 160 points. The total FCIR score is used as an indicator for the project's sponsor to consider alternative sites if the potential adverse impacts on the farmland exceed the recommended allowable level. Sites receiving a combined score of

less than 160 (out of 260 possible points) do not require further evaluation; alternative project locations should be considered for sites with a combined score greater than 160 points.

State

Farmland Mapping and Monitoring Program (FMMP)

The State of California developed the Farmland Mapping and Monitoring Program (FMMP) to provide data to decision makers for use in planning for the present and future of California's agricultural land resources. To meet this goal, FMMP's objective is to provide maps and statistical data to the public; academia; and local, state, and federal governments to assist them in making informed decisions for the best utilization of California's farmland. The California Department of Conservation (DOC) classifies lands into agriculture-related categories: Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, Grazing Land, Urban and Built-up Land, Other Land, and Water.

As shown on **Figure 3.9-3**, according to the FMMP, approximately 52 percent of the Strawberry Fields Site is made up of Grazing Land, with most of the remainder classified as Other Land and negligible areas classified as Water (on the site's western border) and Prime Farmland (on the site's southern border).

Prime farmland is a designation applied to lands with the best combination of physical and chemical features able to sustain long-term agriculture (FMMP, 2015).

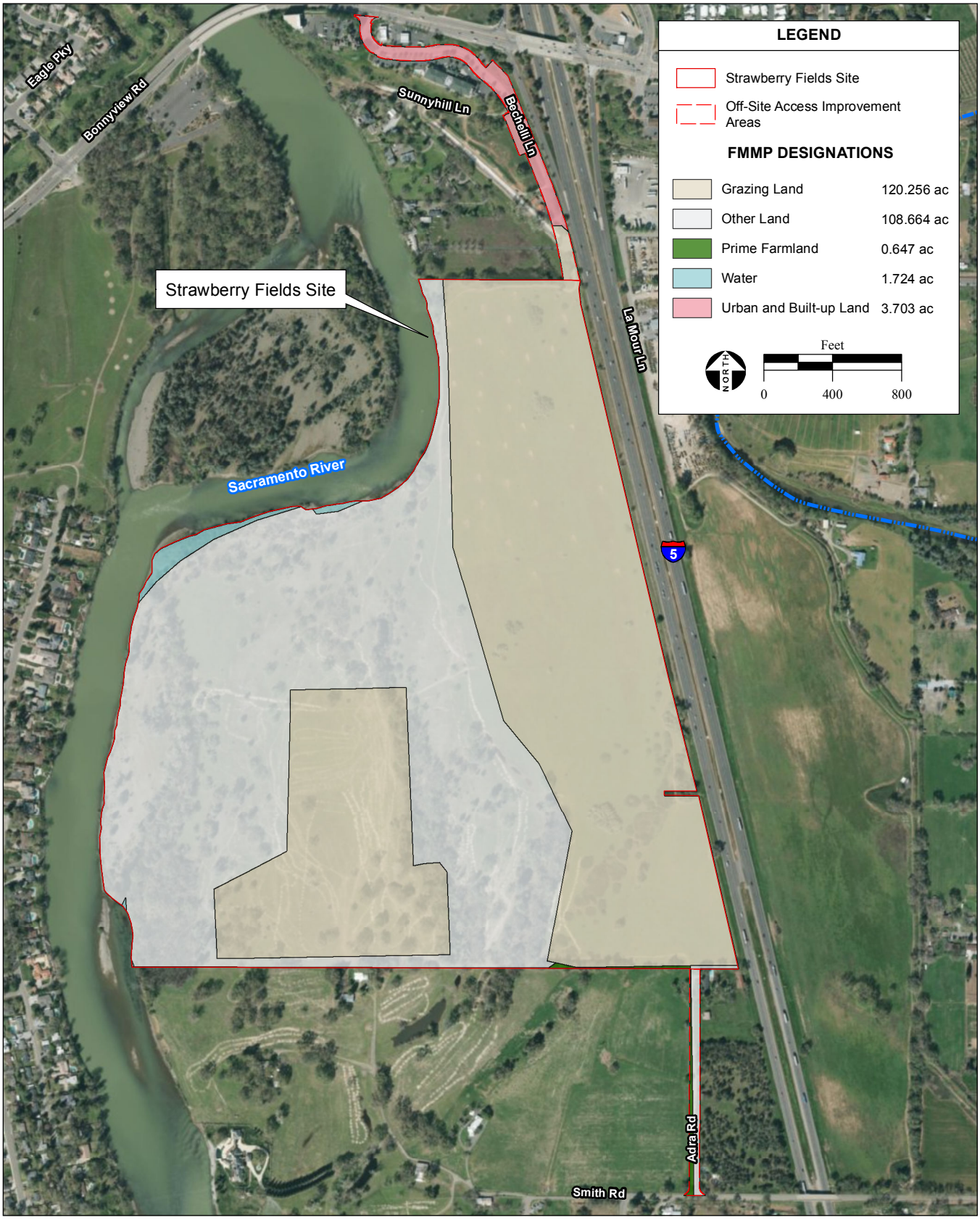
The FMMP classifies the parcels that make up the Anderson Site as Grazing Land, with some Urban and Built-Up Land on the southeast and southwest edges of the site (**Figure 3.9-4**). There is no prime farmland or farmland of local or state importance on site.

Williamson Act

The California Land Conservation Act of 1965, commonly known as the Williamson Act, is designed to preserve farmlands and open space lands by discouraging premature and unnecessary conversion to urban uses. None of the alternative sites are under a Williamson Act contract or within two miles of land under a Williamson Act contract.

California Civil Code Section 3482.5

California Civil Code Section 3482.5, also known as the Right to Farm Act, contains provisions to ensure that agricultural operations are not considered nuisances, so long as they do not obstruct navigable waterways or public areas. This ordinance supersedes any conflicting local regulations, but does not prohibit local jurisdictions from adopting ordinances that allow notification to those in close proximity to an agricultural activity that they are subject to the provisions of the Right to Farm Act.



SOURCE: CA Dept. of Interior, Farmland Mapping and Monitoring Program(FMMP) 2014; USDA aerial photograph, 7/26/2014; ESRI Data, 2016; AES, 7/18/2018

Figure 3.9-3

FMMP Designations for the Strawberry Fields Site

SOURCE: CA Dept. of Interior, Farmland Mapping and Monitoring Program(FMMP) 2014; USDA aerial photograph, 7/26/2014; ESRI Data, 2016; AES, 8/11/2017

Figure 3.9-4
FMMP Designations for the Anderson Site

Local

Shasta County General Plan

The County General Plan contains several provisions related to land uses on agricultural land, as summarized in **Table 3.9-1** in **Section 3.9.1** above.

Shasta County Code Chapter 18.06

Shasta County Code Chapter 18.06, Agriculture and Forestry Notification, contains provisions defining the "policy of Shasta County to protect, promote and encourage agricultural and forestry operations within the county. It is the further intent of Shasta County to provide to the residents of this county proper notification of the county's recognition and support" (Shasta County, 2016a). The section is intended to minimize the loss of agricultural resources by clarifying and limiting the circumstances under which agricultural operations are considered a nuisance. It also provides notification to purchasers and users of properties adjacent to such operations of the inherent potential concerns associated agriculture.

Setting

Strawberry Fields Site

The Strawberry Fields Site is currently used for livestock grazing; while portions of the site have historically been cultivated for the production of row crops, including strawberries, there are no current farming operations occurring on site, nor existing farming infrastructure.

Anderson Site

The Anderson Site is not designated for agriculture, and there are no farming operations on the Anderson Site nor infrastructure that would support land cultivation.

Win-River Casino Site

There are no farming operations on the Win-River Casino Site nor infrastructure that would support land cultivation.

3.10 PUBLIC SERVICES

This section describes the existing environmental conditions for the alternative sites described in **Section 2.2**. The general and site-specific descriptions of public services contained herein provide the environmental baseline by which direct, indirect, and cumulative environmental effects are identified and measured in **Section 4.10**, **Section 4.14**, and **Section 4.15**, respectively. The services that are addressed include: water supply, wastewater collection and treatment, solid waste, law enforcement, fire protection, emergency medical services, electricity, and natural gas. Schools, libraries, and parks are discussed in **Section 3.7**, **Socioeconomic Conditions**.

3.10.1 WATER SUPPLY

Strawberry Fields Site and Off-site Access Improvement Areas Setting

Water Supply Infrastructure

The Strawberry Fields Site is not currently connected to a municipal water system. The North Access Improvement Area, described in **Section 2.2.2**, encompasses Bechelli Lane and runs parallel to the existing City of Redding (City) water main approximately 300 feet north of the Strawberry Fields Site's northern boundary (City of Redding, 2016b).

The City provides water to approximately 80,000 people within its 60-square mile service area (City of Redding, 2016c). The City's water distribution system includes 560 miles of water mains from 1 to 48 inches in diameter, 4,384 hydrants, 12,800 valves, and 3,000 cross-connection control devices (City of Redding, 2016c). Water mains deliver approximately 25,000 acre-feet per year (AFY) of water to more than 29,000 residential and commercial customers within the City's service area (City of Redding, 2017d).

Water Supply Sources and Demand

As stated in the City's 2010 Urban Water Management Plan, the City relies upon both surface water and groundwater supplies (City of Redding, 2012a). The surface-water supply is administered under two separate contracts with the Bureau of Reclamation and with the Anderson-Cottonwood Irrigation District (ACID; **Appendix B**). The City's water supply system's total capacity is approximately 40,040 AFY. On average, the City gets 77.8 percent of its total annual water supply from surface water and 22.2 percent from groundwater (City of Redding, 2017d). Surface water is sourced from the Sacramento River and Whiskeytown Lake (approximately 7.25 billion gallons per year [gpy]; City of Redding, 2016c). Because the City sources surface water from third parties, any agreement by the City to serve water outside its existing City limits is likely to require Local Agency Formation Commission (LAFCo) action and concurrence (**Appendix B**).

The City sources groundwater from 17 wells (with depths ranging from 170 to 600 feet) which extract approximately 2.51 billion gpy from the Enterprise and Anderson Subbasins of the Redding Groundwater Basin (City of Redding, 2016c). The Redding Groundwater Basin is not in overdraft and no legal pumping limit has been set (City of Redding, 2012b). Modelling of the Redding Groundwater Basin has indicated that it is resilient to severe drought conditions and is capable of recovering with one year of normal rainfall (City of Redding, 2016a). The Enterprise and Anderson groundwater basins' water levels have not been increasing or decreasing, but fluctuating between 10 and 15 feet during normal and dry years (DWR, 2004a). Similarly, the Redding Groundwater Basin's water levels have not been increasing or decreasing, but fluctuating between 1 and 10 feet during normal and dry years (DWR, 2004b). The primary source of recharge in the vicinity of the Strawberry Fields Site is infiltration from the nearby Sacramento River, and direct infiltration from precipitation (DWR, 2004a). The quality of the groundwater is generally good, with the City only needing to provide mineral disinfection before allowing the water to enter the City's distribution system (City of Redding, 2016c).

The City is permitted to divert up to 18.7 million gallons per day (MGD) from the Sacramento River and 5.4 MGD from Whiskeytown Lake (City of Redding, 2016c). Sacramento River raw water is pumped from Pump Station No. 1 and treated at the Foothill Water Treatment Plant (WTP) with a treatment capacity of 24 MGD. Whiskeytown Lake raw water is conveyed through the Spring Creek Conduit to the Buckeye WTP with a treatment capacity of 14 MGD (City of Redding 2016c). The Foothill WTP is a conventional treatment facility with expansion capabilities of 42 MGD, and treats water from the Sacramento River. The Buckeye WTP is a gravity-fed, conventional facility that treats water from Whiskeytown Lake (City of Redding, 2016c). The City has 32.7 million gallons (MG) of reservoir storage capacity (City of Redding, 2016c).

Anderson Site Setting

The Anderson Site is not currently connected to a municipal water system.

As described in detail in **Section 3.3.2**, the Anderson Site, like the Strawberry Fields Site, overlies the Redding Groundwater Basin. Refer to **Section 3.3.1** for a detailed description of the Redding Groundwater Basin; as noted therein, the Redding Groundwater Basin is not currently in a state of overdraft and has historically demonstrated resilience to drought conditions. The groundwater table in the vicinity of the Anderson Site ranges from 30 to 40 feet in depth, or 405 to 415 feet above mean sea level (amsl; DWR, 2017c). The primary source of recharge in the vicinity of the Anderson Site is infiltration from the nearby Sacramento River, and direct infiltration from precipitation (DWR, 2004b).

The City of Anderson supplies its municipal water system from 10 groundwater wells with a combined capacity of up to 10,700 AFY. The City of Anderson does not currently purchase or import water on a regular basis. The only contract in place is with the City to provide emergency water to the Wood Acres pressure zone in the City of Anderson. Agricultural water demand in vicinity of the Anderson Site is

provided by ACID, which is a federal contractor that receives water through the U.S. Bureau of Reclamation from the Sacramento River through ACID irrigation canals. In 2015, the City of Anderson supplied approximately 2,150 acre-feet (af) of water to approximately 11,150 people via 3,340 residential and commercial connections (the City of Anderson does not provide any agricultural connections). Residential use accounted for 67 percent of the water demand, while commercial accounted for 15 percent of the demand. The total service area is approximately 6.6 square miles. (City of Anderson, 2015a).

Residences in the vicinity of the Anderson Site are served by a high-producing groundwater well, the Automall Well, operated by the City of Anderson. The Automall Well is the closest municipal well to the Anderson Site, located directly adjacent to the northeast corner of the property (refer to Exhibit 4 of **Appendix B**). Additionally, an existing 12-inch water line runs parallel to the northern boundary of the Anderson Site and serves residences to the west of the Automall Well. In anticipation of providing supply redundancy to southern City of Anderson wells, the City of Anderson's Water System Master Plan includes plans to construct an additional 12-inch water pipe, through the Anderson Site, to serve residencies to the south and provide better pressures and flows (**Appendix B**).

Win-River Casino Site Setting

Municipal water service connections are provided by the City to the Win-River Casino Site, pursuant to a Master Service Agreement signed in September 2012. The Tribe maintains an internal water supply system to provide for domestic and fire flows, and is responsible for any required upgrades to the system. The City's existing water supply is described above. In 2016, the Win-River Casino had an average annual day water usage of 51,618 gallons per day (gpd) and an average summer day water usage of 80,504 gpd (**Appendix B**).

3.10.2 WASTEWATER TREATMENT

Strawberry Fields Site and Off-site Access Improvement Areas Setting

The Strawberry Fields Site is not currently connected to a public wastewater system.

The City maintains 430 miles of sewer lines spanning from 4 to 54 inches in diameter, 17 raw sewage lift stations, 7,780 manholes, and 2 wastewater treatment plants (WWTPs; City of Redding, 2016e). Sewer collection system pipelines for each major drainage basin terminates at either the Clear Creek WWTP or the Stillwater WWTP (City of Redding, 2012b). Maintenance of the wastewater system includes cleaning of the sewer lines on a yearly basis, and regular inspection of sewer lines (City of Redding, 2016e). The North Access Improvement Area, described in **Section 2.2.2**, encompasses Bechelli Lane and runs parallel to an existing 30-inch vitrified clay City wastewater pipeline approximately 300 feet north of the Strawberry Fields Site's northern boundary (City of Redding, 2016b). Wastewater from this collection pipeline is treated at the Clear Creek WWTP, approximately 1.5 miles south of the Strawberry Fields Site (**Appendix B**).

The Clear Creek WWTP's average dry weather design flow is 9.4 MGD, and peak wet weather flow is more than 40 MGD (City of Redding, 2016e). The Clear Creek WWTP employs 5 operators, 1 operator-in-training, 2 laboratory analysts, 1 electrical technician, and 1 mechanic (City of Redding, 2016e). In 2014, the Clear Creek WWTP underwent treatment system improvements and wet-weather flow enhancements (City of Redding, 2016e). Each WWTP in Redding is regulated by separate National Pollutant Discharge Elimination System (NPDES) permits, which detail treatment and reporting requirements and impose effluent limitations. The Clear Creek WWTP is regulated by NPDES permit number CA0079731 (CVRWQCB, 2010). In 2016, the Clear Creek WWTP had a dry weather flow of 7.0 MGD (Mitchell, 2017). Recycled water used for landscape irrigation and wash down purposes at the treatment site is not measured, while the remainder of the effluent is discharged into the Sacramento River where it is repeatedly diverted and treated for reuse by water agencies further downstream (City of Redding, 2016a).

The nearest Clear Creek system lift station is the Sunnyhill Lift Station, located 300 feet north of the Strawberry Fields Site at 5100 Bechelli Lane. As stated in the City's Wastewater Utility Master Plan, the Sunnyhill Lift Station is considered a major facility and has a capacity of 11,950 gallons per minute (gpm) or 17.21 MGD and an 890 foot long force main with a 42-inch lift height (City of Redding, 2012b). In 2015, the Sunnyhill Lift Station had a peak demand of 10.76 MGD. Wastewater flows south from the Sunnyhill Lift Station to the Clear Creek WWTP (Bailey, 2017). Wastewater from the Strawberry Fields Site would pass through the West Side Interceptor, the City's main sewer interceptor leading to the Clear Creek WWTP. The interceptor is currently at capacity and experiences localized overflow during wet periods. The City plans to construct a 42-inch parallel interceptor pipeline that will double conveyance capacity (**Appendix B**). The parallel interceptor pipeline will be installed along Girvan Road, continuing south before reaching the Clear Creek WWTP. Construction is slated for completion by 2022 (Bailey, 2017).

Anderson Site Setting

The City of Anderson operates and maintains the Anderson Water Pollution Control Plant, a Class IV tertiary WWTP (Anderson WWTP; City of Anderson, 2017a). Wastewater is conveyed to the Anderson WWTP by gravity and four lift stations via 38 miles of pipes. The plant has a dry weather flow capability of 2.0 MGD and wet weather flow of 6.0 MGD with treated outflow discharged to the Sacramento River (City of Anderson, 2017a). Additionally, the facility maintains a 3-MG emergency storage basin (City of Anderson, 2017a). In 2015, the Anderson WWTP discharged effluent through a diffused outfall into the Sacramento River at an annual average rate of 1.1 MGD (City of Anderson, 2015a).

The plant is regulated by NPDES permit number CA0077704, which details treatment and reporting requirements and imposes effluent limitations (CVRWQCB, 2007). The nearest City of Anderson sewer pipeline to the Anderson Site is a 21-inch sewer trunk line aligned with the Tormey Drain.

Win-River Casino Site Setting

The Win-River Casino Site currently receives public wastewater services from the City pursuant to a Master Service Agreement signed in September 2012. Win-River Casino wastewater is treated at the City's Clear Creek WWTP. The City's existing wastewater treatment system is described above. In 2016, the Win-River Casino generated an average day sewer flow of approximately 48,600 gpd and a weekend peak flow of approximately 75,900 gpd (**Appendix B**).

3.10.3 SOLID WASTE SERVICES

California Integrated Waste Management Act

In 1989, the State of California enacted Assembly Bill (AB) 939, the California Integrated Waste Management Act, which requires jurisdictions to conduct a solid waste disposal needs assessment that estimates the disposal capacity needed to accommodate projected solid waste generated within the jurisdiction and to identify a minimum of 15 years of permitted disposal capacity. All local jurisdictions are required to divert 50 percent of their total waste stream from landfill disposal.

Strawberry Fields Site and Off-site Access Improvement Areas Setting

The Strawberry Fields Site is located outside the City limits, and therefore outside the service boundaries of the City's Solid Waste Utility service. As such, solid waste service would be provided to the Strawberry Fields Site by Waste Management, Inc., a private solid waste company. Waste Management would collect solid waste from the Strawberry Fields Site and transfer it to the Anderson Landfill (Waste Management, 2016).

The Anderson Landfill, located in Anderson, California, is permitted to accept general residential, commercial, and industrial refuse for disposal, including municipal solid waste, construction and demolition debris, yard waste, and other nonhazardous designated debris. The Anderson Landfill maintains a permitted capacity of 1,850 tons per day. The landfill facility is allowed to dispose of waste on 130 acres of the 246-acre site. The landfill's maximum permitted capacity is 16,840,000 cubic yards with a remaining capacity of 11,914,025 cubic yards. As of March 2008, is estimated to have sufficient capacity to maintain operations through 2093 (CalRecycle, 2016).

Anderson Site Setting

Solid waste services at the Anderson Site would also be provided by Waste Management, Inc., which services all residential communities and businesses within the City of Anderson. Solid waste is disposed of at the Anderson Landfill, as described above.

Win-River Casino Site Setting

Solid waste services at the Win-River Casino Site are provided by Waste Management, Inc. or a similar private solid waste management company, as the existing casino is outside the City's service boundaries.

3.10.4 LAW ENFORCEMENT SERVICES

Criminal Jurisdiction

Enacted in 1953, Public Law 83-280 (PL-280) mandatorily conferred criminal jurisdiction in Indian Country from the federal government to the state level in six states, and allowed other states the option of similarly expanding their criminal jurisdiction. California is one of the six "mandatory PL-280" states. Pursuant to PL-280, the State of California has exclusive criminal jurisdiction in Indian Country in all cases involving a non-Indian offender, regardless of whether the victim is Indian or non-Indian, as well as for victimless crimes with non-Indian offenders. In criminal cases in Indian Country involving an Indian offender, including victimless crimes, the State and tribal governments have concurrent jurisdiction.

Strawberry Fields Site and Off-site Access Improvement Areas Setting

The Strawberry Fields Site and South Access Improvement Area are currently within the service boundary of the Shasta County Sheriff's Office (SCSO). The SCSO is partnered with the Redding Police Department (RPD). The SCSO works with the RPD in respect to major crimes and the Shasta Interagency Narcotics Task Force (Shasta County, 2016b). The North Access Improvement Area is located within the service boundary of the RPD, with all services provided by the RPD.

The SCSO provides specialized law enforcement services to the County and local police protection to both the incorporated and unincorporated areas. The nearest SCSO station is located at 300 Park Marina Circle, approximately 3.0 miles northwest of the Strawberry Fields Site. Specialized law enforcement includes providing court security services, operating a system of jails for pretrial and sentenced inmates, and specialty teams such as the Bomb Team, Dive Team, Hostage Negotiation Team, Search and Rescue Team, and SWAT. Local police protection includes response to calls and trouble spots, investigations, surveillance, and routine patrolling. There are two patrol stations and three patrol sub-stations, which cover approximately 3,700 square miles (Shasta County, 2016b). SCSO is staffed with 1 sheriff, 1 undersheriff, 3 captains, 5 lieutenants, and 89 deputies, including sergeants. In 2016, the SCSO received 59,939 calls for service, which included 815 burglaries, 234 grand thefts, 155 grand theft autos, 22 robberies, 50 rapes, and 5 homicides (Thompson, 2017).

The nearest RPD station is located at City Hall on 777 Cypress Avenue, approximately 3.0 miles northwest of the Strawberry Fields Site. In 2016, RPD received 95,896 calls for service (Murphy, 2017) and responded to 4,557 Part I crimes, considered most serious, including 720 violent crimes and 3,837 property crimes such as burglary, larceny, and vehicle theft (City of Redding, 2016f). RPD is currently staffed by 103 sworn officers.

The Shasta Area Safety Communications Agency (SHASCOM) is a joint powers agency that provides a consolidated communications center for law enforcement agencies throughout Shasta County, including the RPD and the SCSO (City of Redding, 2016g).

California Highway Patrol (CHP)

The California Highway Patrol (CHP) responds to all traffic related incidents in unincorporated Shasta County. Additionally, CHP responds to all incidents on Interstate 5 (I-5), State Route 299 (SR-299), and State Route 44 (SR-44) within the City. The City and County are located within the CHP Northern Division. The Northern Division oversees 20,715 miles of roadway within 13 counties (CHP, 2016). The Northern Division is comprised of 15 Area Offices, 11 Residential Posts, and 2 commercial vehicle enforcement facilities. Total staff for the Northern Division includes 535 uniformed officers and 180 non-uniformed personnel (CHP, 2016). The Northern Division office is located at 2485 Sonoma Street in Redding, approximately 3.8 miles northwest of the Strawberry Fields Site.

Anderson Site Setting

Primary police protection service for the Anderson Site would be provided by the Anderson Police Department (APD). The nearest APD station is located at 2220 North Street, approximately 500 feet southeast of the Anderson Site. The APD has 25 full-time employees and utilizes programs such as the Volunteer Patrol and Neighborhood Watch Programs to identify and solve community problems (City of Anderson, 2016a). Between August 22, 2016, and August 21, 2017, APD received 20,494 calls for service (Beckman, 2017).

The CHP also provides law enforcement services to roadways within the County and in the vicinity of the Anderson Site, as described above. The Northern Division office is approximately 9.5 miles northwest of the Anderson Site.

Win-River Casino Site Setting

Primary police protection service for the Win-River Casino Site is provided by the SCSO, which patrols the area and respond to all traffic related incidents in the vicinity of the Win-River Casino Site. The SCSO and RPD are allied, and work cooperatively on major crimes and on the Shasta Interagency Narcotics Task Force, as described above (Shasta County, 2016b). The nearest SCSO station is located approximately 6 miles north of the Win-River Casino Site. The nearest RPD station is approximately 4.5 miles north of the Win-River Casino Site. From August 1, 2016 to August 1, 2017, SCSO received 538 calls for service to the Win-River Casino (Barnhart, 2017).

The CHP also provides law enforcement services to roadways within the County and in the vicinity of the Win-River Casino Site, as described above. The Northern Division office is approximately 4.6 miles northwest of the Win-River Casino Site.

3.10.5 FIRE PROTECTION AND EMERGENCY MEDICAL SERVICES

Strawberry Fields Site and Off-site Access Improvement Areas Setting

The Strawberry Fields Site and South Access Improvement Area are currently within the service boundary of the Shasta County Fire Department (SCFD), who contracts with the California Department of Fire and Forestry (CAL FIRE). The North Access Improvement Area is located within the service boundary of the Redding Fire Department (RFD; Johnson, 2017). However, RFD, SCFD, and CAL FIRE maintain a mutual/automatic aid agreement (City of Redding, 2016g).

SCFD, CAL FIRE, and the RFD provide emergency services such as fire suppression, emergency medical services, technical rescue, and arson investigations (City of Redding, 2016g). CAL FIRE is contracted by SCFD to provide support staff, dispatching services, fire marshal, fleet maintenance, clerical support, and training (SCFD, 2014). In 2016, SCFD and CAL FIRE responded to 135 vegetation fires, 59 structure fires, 323 other fires, 2,518 medical emergencies, 42 hazardous materials emergencies, and 191 public assistance emergencies, for a total of 3,268 calls (SCFD, 2016). Combined, the SCFD and CAL FIRE maintain a fleet of approximately 252 pieces of fire equipment, including fire engines, water tenders, and boats. The SCFD maintains over 200 volunteer firefighters across 18 stations, while CAL FIRE operates 14 stations within Shasta County (SCFD, 2016). SCFD and CAL FIRE's response area covers 3,400 square miles throughout 20 rural communities within Shasta County (SCFD, 2016). The RFD is staffed by 78 uniformed career personnel throughout the 8 fire stations (City of Redding, 2016g). The RFD responded to 12,863 incidents in 2015 (City of Redding, 2016g).

The Strawberry Fields Site would most likely be served by SCFD and CAL FIRE with mutual aid from the RFD. The Strawberry Fields Site is within the service area of SCFD/CAL FIRE Station 43, approximately 2.6 miles east. Station 43 is staffed by one Type II fire engine and two type II fire engines during peak fire season of June through October (SCFD, 2016). During non-wildfire season (November through May), staffing is reduced to one Type II fire engine and one Type III fire engine. In 2016, Station 43 responded to 1,760 incidents (SCFD, 2016). RFD Station #4 is located approximately 1.4 miles west of the Strawberry Fields Site and RFD Station #5 is located approximately 2.1 miles north of the Strawberry Fields Site.

SHASCOM provides a consolidated communications center for fire protection and emergency medical agencies throughout Shasta County, including the RFD (City of Redding, 2016g). American Medical Response (AMR) Shasta County, the Shasta Regional Medical Center, and the Mercy Medical Center provide ambulance services via a contractual agreement to the City (City of Redding, 2016g) in conjunction with SCFD. The Mercy Medical Center, Shasta Regional Medical Center, and AMR are located approximately 3.6 miles northwest, approximately 4.1 miles north, and 3.8 miles northwest of the Strawberry Fields Site, respectively. The Mercy Medical Center is a 24 hour, 7 days per week Level II Trauma Center with a 28-room emergency department and 267-bed hospital (Mercy Medical Center, 2017). The Shasta Regional Medical Center has limited emergency room wait times and a hospital with

246 beds, over 900 registered nurses, and 300 physicians on staff (Shasta Regional Medical Center, 2017). AMR employs approximately 60 paramedics/emergency medical technicians and handles an average of 10,000 calls per year (AMR, 2017).

Anderson Site Setting

The Anderson Site is located within the service area of the Anderson Fire Department (AFD). The AFD is located approximately 0.4 miles south of the Anderson Site. The AFD is comprised of 3 full-time Captains and 3 full-time firefighters, and 2 full-time personnel who provide service 24 hours a day, 7 days a week. AFD is staffed daily with two personnel assigned to a type 1 fire engine. AFD also staffs a 75-foot ladder truck equipped with a 75-foot aerial ladder, 400 gallons of water, and a 2,000-gpm fire pump as well as a Type 3 engine primarily used for vegetation fires (Lowe, 2017). AFD also has two chief officers that cover and act as command officers at the scene of emergency incidents. During the fire season (typically starting in July and ending in October), there is one additional seasonal firefighter per shift, bringing daily staffing up to three firefighters per day (Lowe, 2017). In 2015, the AFD responded to 2,500 calls for service (City of Anderson, 2016b). AFD also provides emergency medical services to its service area (City of Anderson, 2016b). The Mercy Medical Center, Shasta Regional Medical Center, and AMR are located approximately 9.1 miles, approximately 9.7 miles, and 9.4 miles north of the Anderson Site, respectively. AFD currently has automatic and mutual aid agreements in place with Cottonwood Fire Protection District and CAL FIRE/SCFD, which ensures that multiple engines responds to all fires, traffic collisions and or multiple emergencies within AFD's jurisdiction (Lowe, 2017).

Win-River Casino Site Setting

The RFD, SCFD, and CAL FIRE provide fire protection and emergency services for the Win-River Casino Site through their mutual/automatic aid agreement (City of Redding, 2016g). RFD Station #4 is located approximately 1.6 miles northeast of the Win-River Casino Site and RFD Station #7 is approximately 4 miles east. The nearest CAL FIRE Station is located approximately 4.5 miles east and the nearest SCFD station is located approximately 5.5 miles north of the Win-River Casino Site. The Shasta Regional Medical Center is located approximately 6.0 miles north of the Win-River Casino Site. Both AMR and the Mercy Medical Center are located 5.5 miles northwest of the Win-River Casino Site.

3.10.6 ENERGY AND NATURAL GAS

Strawberry Fields Site and Off-site Access Improvement Areas Setting

No existing electrical transmission lines or natural gas service lines provide service to the site. Electrical service to the Strawberry Fields Site would be provided by Redding Rancheria Utility Corporation (RRUCO), which receives electricity via a contract with Redding Electric Utility (REU). The contract includes meter reads, service restoration, and utility construction for properties owned by the Tribe, including the Strawberry Fields Site. Pacific Gas and Electric Company (PG&E) would provide natural gas services to the Strawberry Fields Site via a private contract.

Redding Electric Utility

REU operates a 61-square-mile service area and provides electricity to approximately 44,000 customers (36,000 residential customers and 8,000 commercial/business). REU's largest customer is the City, which consumes an aggregated 33,000,000 kilowatt hours (kWh) annually. REU's 2016 system peak demand was 231 megawatts (MW; 231,000 kilowatts [kW]).

REU operates 1 natural gas power plant, 726 miles of 12 kilovolt (kV) distribution system lines, 11 substations, 2 switchyards, and 262 thermal energy storage units located strategically throughout the 61-square-mile service area (City of Redding, 2016h). REU's largest single source of electricity is the Redding Power Plant with the capacity to produce 186 MW of power annually. In 1986, REU built a 3.5 MW small hydroelectric power plant at the base of Whiskeytown Dam. Further, in 2006, REU added wind power from the Pacific Northwest to its renewable energy resource portfolio. REU is currently on track to meet the Renewables Portfolio Standard target of 50 percent renewable energy sources by 2030 (City of Redding, 2016h). The nearest REU substation is the Moore Road substation approximately 2.5 miles west of the Strawberry Fields Site (Ross, 2017). REU electrical lines run along the northern boundary of the Strawberry Fields Site.

PG&E

PG&E provides natural gas and electric service to approximately 16 million people throughout a 70,000 square mile service area in Central and Northern California. PG&E maintains 42,141 miles of natural gas distribution pipelines and 6,438 miles of transportation pipelines and provides natural gas service to 4.3 million customer accounts (PG&E, 2017). The nearest PG&E natural gas mainline pipeline exists approximately 1,100 feet north of the Strawberry Fields Site, just south of the Hilton Garden Inn parking lot along Bechelli Lane (Perez, 2017).

Anderson Site Setting

Electricity and natural gas services within the vicinity of the Anderson Site are provided by PG&E (CEC, 2017). A PG&E natural gas mainline pipeline and electrical junction box are both located approximately 350 feet north of the Anderson Site (Perez, 2017). The junction box has capacity for three-phase power, which is suitable for large commercial development (Perez, 2017).

Win-River Casino Site Setting

Electrical service to the Win-River Casino Site is currently provided RRUCO, located on site. RRUCO receives electricity from the City, per a June 2010 utilities service agreement with REU. In October 2013, an additional agreement was made for the City to credit the Tribe for electrical power from the Tribe's Base Resource Allocation from Western Contract 00-SNR-00370. The Win-River Casino Site would continue to obtain power from the City. The City utilizes the Tribe's allocation from the Central Valley Project (CVP) and credits the Tribe for this energy in the Tribe's electrical utilities bills. The City

provides electric utilities via a 12 kV circuit located east of the current Rancheria. REU is described above. Natural gas service to the Win-River Casino Site is provided by PG&E.

3.11 NOISE

This section describes the existing noise conditions at the alternative sites described in **Section 2.2**. The general and site-specific description of the noise setting contained herein provides the environmental baseline by which direct, indirect, and cumulative environmental effects are identified and measured in **Section 4.11**, **4.14**, and **4.15**, respectively.

3.11.1 ACOUSTICAL BACKGROUND AND TERMINOLOGY

Sound is defined as any pressure variation in air that the human ear can detect, and is technically described in terms of loudness (amplitude) and frequency (pitch). The standard unit of sound amplitude measurement is the decibel (dB). The dB scale uses the hearing threshold (20 micropascals of pressure), as a point of reference, defined as 0 dB. Other sound pressures are then compared to the reference pressure, and the logarithm is taken to keep the numbers in a practical range. The dB scale allows a million-fold increase in pressure to be expressed as 120 dB.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by weighing the frequency response of a sound level meter by means of the standardized A-weighting network. There is a strong correlation between A-weighted sound levels (expressed as dBA) and community response to noise. For this reason, the dBA sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels in dB.

Community noise is commonly described in terms of the "ambient" noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent noise level (Leq) over a given time period (usually one hour). The Leq is the foundation of the Day-Night Average Sound Level (Ldn) noise descriptor, and shows very good correlation with community response to noise. The Ldn is based upon the average noise level over a 24-hour day, with a +10 dB weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were louder than daytime exposures. Because Ldn represents a 24-hour average, it tends to disguise short-term variations in the noise environment. Ldn-based noise standards are commonly used to assess noise effects associated with traffic, railroad, and aircraft noise sources. **Table 3.11-1** contains definitions of acoustical terminology used in this section and **Section 4.11**. **Table 3.11-2** shows examples of noise sources and their effects on humans, which correspond to various sound levels.

Effects of Noise on People

The effects of noise on people fall into three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction;
- Interference with activities such as speech, sleep, and learning; and
- Physiological effects such as hearing loss or sudden startling.

TABLE 3.11-1
ACOUSTICAL TERMINOLOGY

Terms	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 10 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	Sound pressure level in dBs as measured on a sound level meter using the A-weighting filter network, which de-emphasizes very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, Leq	The average A-weighted noise level during the measurement period.
Day/Night Noise Level, Ldn	The average dBA noise level during a 24-hour day, obtained after addition of 10 dB to levels measured in the night between 10:00 p.m. and 7:00 a.m.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Source: FHWA, 2011.	

TABLE 3.11-2
TYPICAL A-WEIGHTED SOUND LEVELS

Common Indoor/Outdoor Activities	Noise Level (dBA)
Maximum output of stereo	110
Leaf blower	105
Food Processor	100
Weed whacker	96
Hair dryer	95
Electric can opener	83
Garbage disposal	83
Phone	75
Normal conversation	65
Hot air heating system	52
Background music	50
Computer	45
Typical living room	40
Quiet room	33
Quiet basement	20
Grand Canyon at night (no roads, birds, or wind)	10
Threshold of hearing	0
Source: NPC, 2017.	

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists, and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Human reaction to a new noise can be estimated through comparison of the new noise to the existing ambient noise level within a given environment. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will likely be judged by the recipients. With regard to increases in dBA noise levels, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived.
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference.
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected.
- A 10-dBA change is subjectively heard as approximately a doubling in loudness and can cause adverse response.

Noise effects on humans can be physical or behavioral in nature. The mechanism for chronic exposure to noise leading to hearing loss is well established. The elevated sound levels cause trauma to the cochlear structure in the inner ear, which gives rise to irreversible hearing loss. Though not considered a health effect similar to those noted above, noise pollution also constitutes a significant factor of annoyance and distraction in modern artificial environments:

- The meaning listeners attribute to the sound influences annoyance; if listeners dislike the noise content, they are annoyed.
- If the sound causes activity interference (for example, sleep disturbance), it is more likely to annoy.
- If listeners feel they can control the noise source, it less likely to be perceived as annoying.
- If listeners believe that the noise is subject to third party control, including police, but control has failed, they are more annoyed.

Generally, most noise is generated by transportation systems, principally motor vehicle noise, but also including aircraft noise and rail noise. The level of traffic noise depends on three things: l) the volume of the traffic, 2) the speed of the traffic, and 3) the number of trucks in the flow of the traffic. Because noise is measured on a logarithmic scale, 70 dBA plus 70 dBA does not equal 140 dBA. Instead, two sources of equal noise added together have been found to result in an increase of 3 dBA. That is, if a certain volume of traffic results in a noise level of 70 dBA the addition of the same volume of traffic, or doubling, would result in a noise level of 73 dBA (Caltrans, 2013a). As stated above, 3 dBA is just

audible; therefore, if a project doubles the traffic volume there would be an audible increase in the ambient noise level.

Stationary points of noise attenuate (lessen) at a rate of 6 to 9 dBA per doubling of distance from the source, depending on environmental conditions (i.e., atmospheric conditions and noise barriers, vegetative or manufactured, etc.). Widely distributed noises, such as a large industrial facility or a street with moving vehicles would typically attenuate at a lower rate, approximately 4 to 6 dBA per doubling of distance.

3.11.2 REGULATORY SETTING

Federal Highway Administration (FHWA) Construction Noise Thresholds

The Federal Highway Administration (FHWA) provides construction noise level thresholds in its 2006 Construction Noise Handbook, which are provided in **Table 3.11-3**.

TABLE 3.11-3
FEDERAL CONSTRUCTION NOISE THRESHOLDS

Noise Receptor Locations and Land Uses	Daytime (7 am - 6 pm)	Evening (6 pm - 10 pm)	Nighttime (10 pm - 7 am)
	dBA, Leq[1]		
Noise-Sensitive Locations (residences, institutions, hotels, etc.)	78 or Baseline + 5 (whichever is louder)	Baseline + 5	Baseline + 5 (if Baseline < 70) or Baseline + 3 (if Baseline > 70)
Commercial Areas (businesses, offices, stores, etc.)	83 or Baseline + 5	None	None
Industrial Areas (factories, plants, etc.)	88 or Baseline + 5	None	None

Notes:
1 - Leq thresholds were empirically determined (FHWA, 2006).
Source: FHWA, 2006.

Federal Noise Abatement Criteria (NAC)

Operational noise standards used in this study are FHWA Noise Abatement Criteria (NAC) for the assessment of noise consequences related to surface traffic and other project-related noise sources. These standards are discussed below.

The FHWA establishes NAC for various land uses that have been categorized based upon activity. Land uses are categorized on the basis of their sensitivity to noise as indicated in **Table 3.11-4**. The FHWA NAC are based on peak traffic hour noise levels. Sensitive receptors with the potential to be impacted by the project alternatives include residential land uses; thus, the Category B noise standard (67 dBA Leq) would apply.

TABLE 3.11-4
FEDERAL NOISE ABATEMENT CRITERIA HOURLY A-WEIGHTED SOUND LEVEL DECIBELS[1]

Activity Category	Activity Criteria Leq (h), dBA	Evaluation Location	Activity Category Description
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67	Exterior	Residential.
C	67	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails and trail crossings.
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E[1]	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	--	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, shipyards, utilities (water resources, water treatment, electricity), and warehousing.
G	--	--	Undeveloped lands that are not permitted.

Notes:
1 - Includes undeveloped lands permitted for this activity category.
Source: FHWA, 2010.

Federal Vibration Standards

The effects of groundborne vibrations typically cause only a nuisance to people, but at extreme vibration levels, damage to buildings may occur. Although groundborne vibration can be felt outdoors, it is typically an annoyance only indoors, where the associated effects of the building shaking can be notable. Groundborne noise is an effect of groundborne vibration and only exists indoors, since it is produced from noise radiated from the motion of the walls and floors of a room and may consist of the rattling of windows or dishes on shelves.

Peak particle velocity (PPV) is often used to measure vibration. PPV is the maximum instantaneous peak (inches per second) of the vibration signal. The PPV levels are used to estimate L_v or VdB levels (vibration decibels with a reference velocity of one micro-inch per second). Scientific studies have shown that human responses to vibration vary by the source of vibration, which is either continuous or transient. Continuous sources of vibration include construction, while transient sources include truck movements. Generally, the thresholds of perception and annoyance are higher for transient sources than for continuous sources. **Table 3.11-5** summarizes the Federal Transportation Administration's (FTA's) guideline vibration damage criteria for various structural categories. As shown therein, buildings extremely susceptible to vibration damage could be damaged if vibration levels exceed 90 VdB. Additionally,

although humans have a perceptibility threshold of 65 VdB, human response to vibration is not usually significant unless the vibration exceeds 70 VdB (FTA, 2006). Background vibration velocity in residential areas is usually 50 VdB or lower.

TABLE 3.11-5
CONSTRUCTION VIBRATION DAMAGE CRITERIA

Building Category	Approximate PPV (in/sec)	Approximate L_v (VdB)
Reinforced-concrete, steel, or timber (no plaster)	0.5	102
Engineered concrete and masonry (no plaster)	0.3	98
Non-engineered timber and masonry buildings	0.2	94
Buildings extremely susceptible to vibration damage	0.12	90
Source: FTA, 2006.		

Local Planning Documents – Noise Element

Shasta County

The Shasta County (County) General Plan's Noise Element dictates that noise generated by new transportation sources or roadway improvement projects be mitigated to satisfy the following maximum allowable noise exposure standards: for residential, transient lodging, hospital, and nursing homes land uses, the Ldn/Community Noise Equivalence Level (CNEL) shall not exceed 60.0 dB in outdoor activity areas[1] and 45 dB in interior spaces; for playground and neighborhood park land uses, the Ldn/CNEL shall not exceed 70.0 dB in outdoor activity areas (Shasta County, 2004). However, in the event that it is not practicable or possible to reduce noise levels in outdoor activity areas, exterior noise levels in excess of 65.0 dB Ldn/CNEL may be allowed provided that exterior noise level reduction measures have been implemented and interior noise levels are compliant with the County's standards, as shown in **Table 3.11-6**.

TABLE 3.11-6
EXTERIOR NOISE STANDARDS FOR NEW TRANSPORTATION SOURCES OR ROADWAY IMPROVEMENT PROJECTS IN SHASTA COUNTY AND THE CITY OF REDDING

Existing Traffic Noise Level (Ldn)	Increase in Noise Level Considered Significant (Ldn)
< 60 dB	+ 5 dB
60 dB – 65 dB	+ 3 dB
> 65 dB	+ 1.5 dB
Source: FICON, 1992; Shasta County, 2004; City of Redding, 2000.	

[1] When the location of the outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use (Shasta County, 2004).

The County General Plan's Noise Element does not contain any specific standards for noise resulting from construction activities. The County Code of Ordinances does not include standards for construction noise.

City of Redding

The City of Redding (City) General Plan's Noise Element includes outdoor and indoor noise standards for new transportation sources or roadway improvement projects that are identical to those contained in the County General Plan's Noise Element (City of Redding, 2000). However, when it is impractical to reduce increase traffic noise to levels matching those listed above, criteria identified in **Table 3.11-6** may be used as a test of significance for roadway improvement projects.

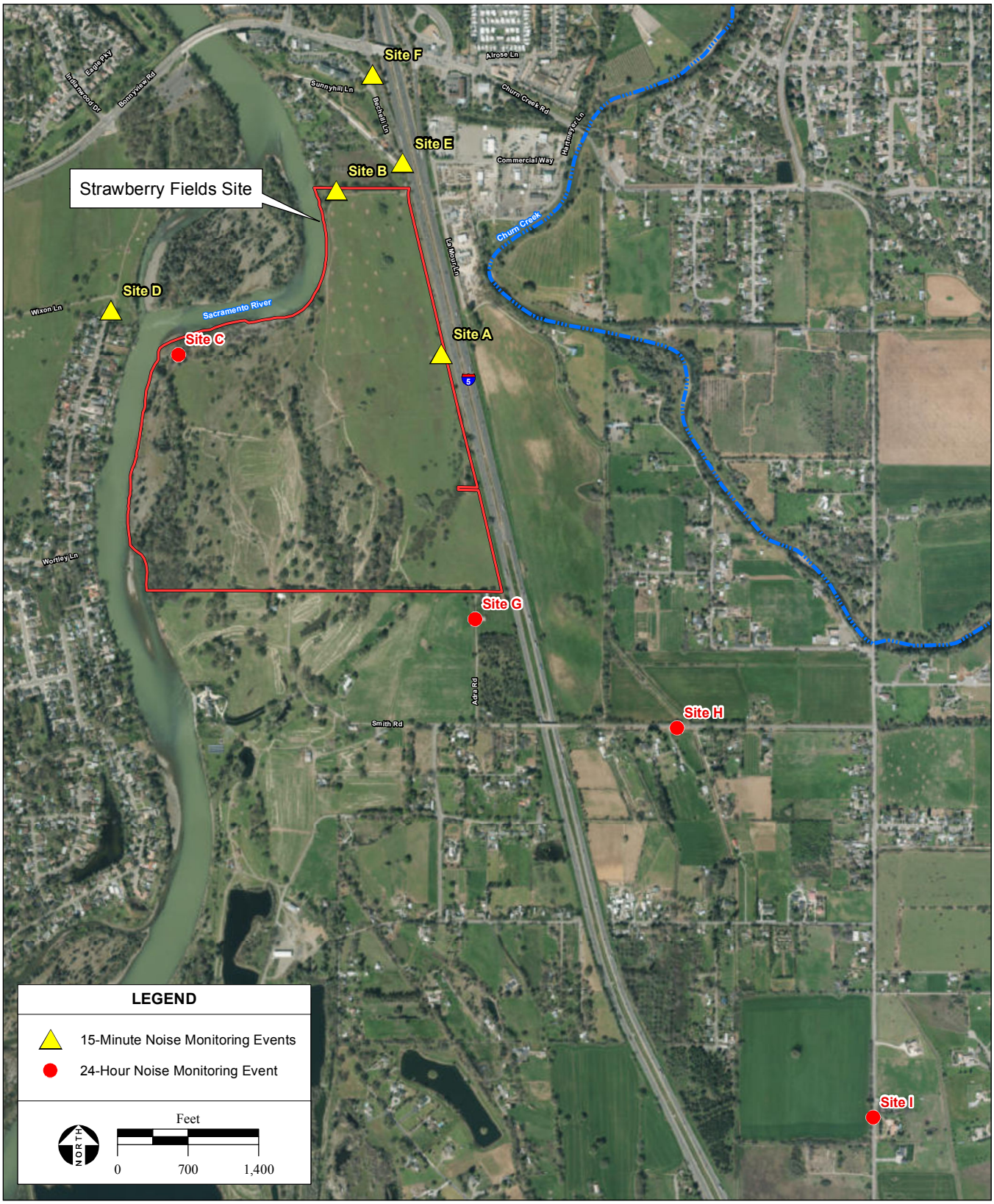
The City Code of Ordinances prohibits the use of tools or equipment used in construction work within 500 feet of a residential district such that the sound creates a noise disturbance during various hours, depending on the day of the week and time of year (Redding Municipal Code 18.40.100[F][2]). However, these prohibitions do not extend to "[s]treet, utility and similar construction projects undertaken by or under contract to the city of Redding, county of Shasta, or state of California [sic]" (Redding Municipal Code 18.40.100[H][5]), nor do they apply to "[a]ny other activity… [for which] regulation thereof has been preempted by state or federal laws" (Redding Municipal Code 18.40.100[I]). The City General Plan's Noise Element does not contain any specific standards for noise resulting from construction activities.

City of Anderson

Noise Policy 1 of the City of Anderson General Plan's Noise Element dictates that noise be kept within acceptable levels in all residential and mixed-use neighborhoods, while Noise Policy 2 states that the placement of high noise-generating land uses adjacent to residential development, schools, hospitals, or similar noise-sensitive receptors should be avoided (City of Anderson, 2007). Noise Mitigation Implementation 6 of the Noise Element requires that appropriate noise barriers or other design features be constructed for projects which significantly increase noise levels, and Noise Mitigation Implementation 9 requires that short-term construction noise be mitigated by limiting hours of operation or through other mitigation strategies (City of Anderson, 2007).

3.11.3 ENVIRONMENTAL SETTING

Existing noise levels in the vicinity of the project alternative sites were measured at locations adjacent to sensitive noise receptors and/or where project-related noise has the potential to increase the ambient noise level. Noise measurements were taken at the locations specified in **Figures 3.11-1** and **3.11-2**. Measurement equipment consisted of Quest Sound Pro SE/DL sound level meters. An acoustical calibrator was used to calibrate the sound level meter before and after use. All instrumentation satisfies the Type II (precision) requirements.



SOURCE: USDA aerial photograph, 7/26/2014; ESRI Data, 2016; AES, 7/18/2018

Figure 3.11-1

Alternatives A, B, C and D - Noise Monitoring Sites

SOURCE: USDA aerial photograph, 7/26/2014; ESRI Data, 2016; AES, 7/18/2018

Figure 3.11-2
Alternative E - Noise Monitoring Sites

Strawberry Fields Site – Alternatives A, B, C, and D

Existing Noise Levels

Noise at the Strawberry Fields Site primarily comes from Interstate 5 (I-5) to the east. As shown in **Table 3.11-7**, measurements at Sites A, B, D, E, and F surrounding the Strawberry Fields Site show 15-minute readings of noise levels, while the measurements at Sites C, G, H, and I were conducted over a 24-hour period. Noise measurement reports are provided as **Appendix G**.

TABLE 3.11-7
SUMMARY OF 15-MINUTE AND 24-HOUR NOISE LEVEL MEASUREMENTS – STRAWBERRY FIELDS SITE

Site	Date	Start Time	End Time	Noise Source	Receptor	Measured Noise Level (dBA Leq)
A	10/18/16	10:03 am	10:18 am	Existing Traffic (I-5)	On-Site Hotel Guests	66.8
B	10/18/16	10:10 am	10:26 am	Existing Residences	Residences	53.6
C	10/18/16 – 10/19/16	10:49 am	10:48 am	Existing Residences and River	Residences	48.8
D	12/22/16	12:21 pm	12:36 pm	Existing Traffic (Riverside Dr) and Residences	Residences	51.3
E	12/22/16	11:37 am	11:52 am	Existing Traffic (Bechelli Ln)	Residences	70.2
F	12/22/16	11:54 am	12:09 pm	Existing Traffic (Bechelli Ln)	Hilton Hotel Guests	61.7
G	7/18/17 – 7/19/17	12:01 am	12:05 pm	Existing Traffic (Adra Way) and Residences	Residences	52.4
H	7/18/17 – 7/19/17	11:59 am	12:00 pm	Existing Traffic (Smith Rd)	Residences	58.2
I	7/18/17 – 7/19/17	11:12 am	11:13 am	Existing Traffic (Churn Creek Rd)	Residences	62.1

Source: **Appendix G**.

Existing Vibration Levels

There are no existing vibration sources on or in the vicinity of the Strawberry Fields Site with the potential to create vibration levels that would create audible noise levels or would cause noticeable ground-borne vibrations.

Noise-Sensitive Receptors

Noise-sensitive land uses are generally defined as land uses with the potential to be adversely affected by the presence of noise. Examples of noise-sensitive land uses include residential housing, schools, and health care facilities. The nearest residential noise-sensitive receptor to the Strawberry Fields Site is a private residence located in County along the southern access private driveway (referred to herein as Adra Way) immediately adjacent to the southern boundary; this receptor would be located approximately 100 feet south of the nearest extent of on-site construction under Site Access Option 1, and approximately 65 feet south of the nearest extent of on-site construction under Site Access Option 2. There are also residences located within the City approximately 150 feet north of the northern boundary of the Strawberry Fields Site and approximately 290 feet northwest of the nearest proposed development on the Strawberry Fields Site (the northernmost parking lot). Additionally, there are residences located west of the Strawberry Fields Site on the western side of the Sacramento River within the City; at their closest

point, these residences are approximately 330 feet west of the western boundary of the Strawberry Fields Site and approximately 1,870 feet west of the nearest proposed development. The nearest schools to the Strawberry Fields Site are Redding Community Day School and Stellar Secondary High School, located on South Bonnyview Road, approximately 3,200 feet west of the Strawberry Fields Site. The nearest medical facility is Churn Creek Healthcare, located approximately 1.8 miles north of the site.

The nearest sensitive receptors to the Off-site Access Improvement Areas are the Hilton Garden Inn located along Bechelli Lane, which would be approximately 50 feet from the nearest extent of off-site access improvements under Site Access Options 1 and 2; and two private residences located adjacent to Adra Way, which would be approximately 25 and 30 feet, respectively, from the nearest extent of off-site access improvements under Site Access Option 2.

Anderson Site – Alternative E

Existing Noise Levels

The 15-minute readings of noise levels taken at Sites 1 and 2 (**Figure 3.11-2**) are shown in **Table 3.11-8**.

TABLE 3.11-8
SUMMARY OF 15-MINUTE AND 24-HOUR NOISE LEVEL MEASUREMENTS – ANDERSON SITE

Site	Date	Start Time	End Time	Noise Source	Receptor	Measure Noise Level (dBA Leq)
1	10/19/16	11:13 am	11:28 am	Existing Traffic (I-5) and Residences	Residences	55.5
2	10/19/16	11:40 am	11:59 am	Existing Traffic (I-5)	On-Site Hotel Guests	62.2
Source: **Appendix G**.						

Existing Vibration Levels

There are no existing vibration sources in the vicinity of the Anderson Site.

Noise-Sensitive Receptors

The nearest residential noise-sensitive receptors to the Anderson Site are residences located immediately adjacent to the southern and western portions of the site. The nearest school is Ladybug Landing Preschool and Development Center located adjacent to the southern boundary of the Anderson Site. The nearest medical center is Anderson Walk-In Medical Clinic located approximately 600 feet east of the Anderson Site.

Win-River Casino Site – Alternative F

Existing Noise Levels

No noise measurements were taken at the Win-River Casino Site. Because this site is located within the Tribe's existing reservation, which has been taken into federal trust on behalf of the Tribe, federal NACs do not apply. Despite this, the Tribe desires to shield its patrons from harmful or excessive noise levels.

Sources of noise in the vicinity of the Win-River Casino Site include traffic from State Route 273 (SR-273) and Redding Rancheria Road, as well as from the existing casino, event center, and hotel facility. The Win-River Casino Site is estimated to have an ambient noise level of 55 dBA, Leq, based on similar commercial operations (The Engineering Toolbox, 2017).

Existing Vibration Levels

There are no existing vibration sources in the vicinity of the Win-River Casino Site.

Noise-Sensitive Receptors

The nearest residential noise-sensitive receptors are residences located on the current Rancheria that are approximately 100 feet east of the proposed event center under Alternative E and immediately adjacent to the existing casino/hotel parking lot. There are also private residences located approximately 300 feet south of the existing casino/hotel parking lot on the south bank of the Anderson Cottonwood Canal within the City. The nearest school is Redding Rancheria Head Start Preschool, located on the Win-River Casino Site and approximately 200 feet from the nearest extent of on-site construction. The nearest medical facility is the County Public Health complex, located approximately 2.9 miles north of the Win-River Casino Site.

3.12 HAZARDOUS MATERIALS

This section describes the existing environmental conditions related to hazardous materials for the alternative sites described in **Section 2.2**. The general and site-specific discussion relating to hazardous materials contained herein provides the environmental baseline by which direct, indirect, and cumulative environmental effects are identified and measured in **Section 4.12**, **Section 4.14**, and **Section 4.15**, respectively.

3.12.1 REGULATORY SETTING

Hazardous materials are those materials that may pose a material risk to human health or the environment. These materials are subject to numerous laws and regulations at several levels of government. At the federal level, human exposure to chemical agents, and in some cases environmental and wildlife exposure to such agents, is regulated primarily by four agencies: the United States Environmental Protection Agency (USEPA), the Food and Drug Administration (FDA), the Occupational Safety and Health Administration (OSHA), and the Consumer Product Safety Commission (CPSC). The USEPA administers several Congressional statutes pertaining to human health and the environment, including the Clean Air Act (CAA), which regulates hazardous air pollutants, and the Resource Conservation and Recovery Act (RCRA; codified in 42 United States Code [USC] Section 6901 *et seq*.), which regulates land disposal of hazardous materials, which are defined as substances that display one or more of the following characteristics: corrosivity, flammability, reactivity, or toxicity (40 Code of Federal Regulations [CFR] Section 261). The CPSC plays a limited role in regulating hazardous substances; it deals primarily with the labeling of consumer products. The FDA also plays a limited role in regulating hazardous substances; it primarily regulates food additives and contaminants, human drugs, medical devices, and cosmetics. OSHA regulations (codified in 29 CFR Parts 70-71, 2200-2205, 2400, and 1910) include provisions that require facilities to document the potential risk associated with the storage, use, and handling of toxic and flammable substances. In addition to these regulatory agencies, the United States Department of Transportation (DOT) regulates the interstate transport of hazardous materials.

"Hazardous material" is defined in the California Code of Regulations (CCR), Title 22, Division 4.5, Chapter 10, Article 2, § 66260.10, 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."

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) addresses the sale, distribution, and labeling of pesticides, as well as the certification and training of pesticide applicators. The FIFRA also establishes recordkeeping and reporting requirements on certified applicators of restricted use pesticides, as well as imposing storage, disposal, and transportation requirements on registrants, and applicants for

registration, of pesticides. Pesticide use is regulated through requirements to apply pesticides in a manner consistent with the label. The labeling requirement includes directions for use, warnings, and cautions, along with the uses for which the pesticide is registered (i.e., pests and appropriate applications). Labeling requirements also include specific conditions for the application, mixture, storage, and time period for re-entry to fields following pesticide application, and when crops may be harvested after applications. If a pesticide is used in a manner contrary to its labeling, the use constitutes a violation of the FIFRA.

3.12.2 ENVIRONMENTAL SETTING

Strawberry Fields Site

The Strawberry Fields Site is currently undeveloped and used as grazing land. An overhead electrical utility line runs along the northern border of the Strawberry Field Site. A site visit of the Strawberry Fields Site was conducted on December 22, 2016. Notable environmental conditions at the time of the survey included an underground piping system, an unused concrete water distribution structure with scattered debris, a dilapidated sheet metal structure, and electrical boxes. No evidence of hazardous materials were observed to be leaking or spilled to the ground.

2009 Phase I Environmental Site Assessment (ESA)

Sharrah Dunlap Sawyer, Inc. prepared a Phase I Environmental Site Assessment (ESA) of the Strawberry Fields Site in accordance with the American Society for Testing and Materials (ASTM) Standard Practice E1527-05 in December 2009. The purpose of this assessment was to identify recognized environmental conditions (RECs) and hazardous materials involvement that may pose a material risk to human health or to the environment, or in any way affect the proposed use of the sites. In addition to the site reconnaissance, a historical review was conducted to identify RECs associated with previous land uses, and database searches were conducted for records of known hazardous material generation, storage, or disposal sites in the vicinity of the Strawberry Fields Site. The report concluded that "[i]nformation obtained during the performance of this Phase I ESA has not revealed any evidence of recognized environmental conditions in connection with the subject site" (SDS, 2009).

Past Hazardous Materials Involvement

The Strawberry Fields Site was previously used for strawberry growing operations focused on the plant instead of the fruit (SDS, 2009). Accordingly, limited pesticides were used, and the fungicides that were used are not considered persistent in the environment. Fumigants typically applied during strawberry production are methyl bromide and chloropicrin, which are applied under a tarp and escape to the air once the tarp is removed. Use of these chemicals is not considered hazardous materials contamination nor an REC (SDS, 2009).

2017 Phase I ESA

A Phase I ESA was prepared in accordance with ASTM Standard Practice E1527-13 ESAs and Bureau of Indian Affairs (BIA) guidelines (**Appendix H**; AES, 2017). A full listing of databases consulted is provided in the Phase I ESA, included in this document as **Appendix H**. None of the databases revealed reports of past or current contamination on the Strawberry Fields Site. No RECs were identified on or in the immediate vicinity of the site that would be likely to pose a significant impact to the environmental integrity of the Strawberry Fields Site.

Hazardous Material Sites

The database search conducted as part of the Phase I ESA identified several sites within a 1.0-mile radius, as indicated in **Table 3.12-1**. Refer to **Appendix H** for additional information on adjacent hazardous material sites.

TABLE 3.12-1
RESULTS OF HAZARDOUS MATERIALS DATABASE SEARCHES FOR THE STRAWBERRY FIELDS SITE

Property	Proximity to Site	Cleanup Status	Potential Contaminants of Concern	Potential Media Affected	Database
Iron Mountain Mine	<0.5 mile	Open – Inactive as of 6/14/2001	Acid, Copper, Cadmium, and Zinc	None specified	NPL, SEMS, US ENG CONTROLS, US INST CONROL, ROD, PRP, ICIS, CONSENT, FINDS, ECHO
Viking Freight Systems – 8562 Commercial Way	<0.25 mile	Completed – Case Closed as of 12/09/1997	Diesel	Soil	LUST, Hist Cortese, Sweeps UST, CA FID UST
Conoco Phillips/BP Oil/Mobil/Tosco – 5101 Churn Creek Rd	<0.5 mile	Open – Site Assessment as of 1/22/2015	Other Solvent or Non-Petroleum Hydrocarbon	Aquifer used for drinking water supply	LUST, SWEEPS UST, CA FID USET, CUPA Listings, HAZNET, Hist UST, RCRA-SQG, FINDS, ECHO
Mobil SS Redding – 5181 Churn Creek Rd	<0.5 mile	Completed – Case Closed as of 06/24/1987	Gasoline	Soil	LUST, Hist Cortese
Anderson Cottonwood Disposal – 8592 Commercial Way	<0.5 mile	Completed – Case Closed as of 05/011/2003	Diesel	Aquifer used for drinking water supply	LUST, CUPA Listings, Hist Cortese, AST, SWEEPS UST, WDS
Churn Creek Chevron – 4746 Churn Creek Rd	<0.5 mile	Completed – Case Closed as of 01/23/2013	Gasoline	Other groundwater (uses other than drinking water)	LUST, CUPA Listings, Hist Cortese
Arco SS #6027 Redding – 5150 Churn Creek Rd	<0.5 mile	Completed – Case Closed as of 09/07/1993	Waste Oil/Motor/ Hydraulic/ Lubricating	Soil	LUST, SWEEPS UST, CUPA Listings, Hist Cortese

Source: **Appendix H**.

Although several cases are listed within one mile of the Strawberry Fields Site, the two open cases, as shown in **Table 3.12-1,** are described below.

Iron Mountain Mine (IMM)

Iron Mountain Mine (IMM) is a Superfund site where more than a dozen sulfide mines have been worked for silver, gold, copper, zinc, and pyrite. The site covers approximately 4,400 acres and involves discharge of acidic waters typically with a high content of heavy metals, referred to as acid mine drainage (AMD). The IMM contains a massive deposit of nearly pure sulfide and an iron-containing deposit. The sulfides and iron were mined in open pits and underground openings from the 1860s until 1963, and IMM was considered one of the largest copper mines in the United States during the early twentieth century (**Appendix H**).

Although the IMM is located approximately 8.5 miles northwest of the Strawberry Fields Site, downstream reaches of the Sacramento River within 0.35 miles of the Strawberry Fields Site are affected by the AMD. Natural resources in the downgradient Sacramento River include valuable fisheries and water resources as well as recreational uses. Additionally, usage of the Sacramento River is continuously increasing to serve a growing California population, which increases the significance of AMD impacts (**Appendix H**).

In the early 1960's, the Spring Creek Reservoir was developed as a mitigation measure for the AMD discharges. However, remedial investigation activities at IMM did not begin until 1983 and the site was placed on the National Priorities List (NPL) of the nation's most contaminated sites. Additionally, Remedial Investigation Reports and Endangerment Assessments were prepared to evaluate potential threats to the environment resulting from contaminants infiltrating the groundwater, surface water, and air (USEPA, 2013b).

In order to reduce potential threats to the environment from the IMM, long-term remedies selected in five Record of Decisions (RODs) have been implemented. Remedies for the IMM consist of a combination of source control, AMD collection and treatment, water diversion, and coordinated releases of contaminated surface water. In the 2013 Five Year Review, the assessment determined that the remedies are operating as intended and the maintenance of the IMM has been satisfactory over the past five years. The remedial actions have eliminated 97 percent of the historical metal discharges from the IMM. Additional water quality sampling of the Sacramento River, performed between 2008 and 2012, indicates that concentrations of copper, cadmium, and zinc comply with the Water Quality Control Plan for the Sacramento Basin and San Joaquin River Basin standards. Therefore, due to its compliance with water quality standards, this site is not an environmental threat to the Strawberry Fields Site (**Appendix H**).

5101 Churn Creek Road

Although currently vacant, 5101 Churn Creek Road was formerly a gasoline service station, in operation from 1967 until 2004. In 1977, an undocumented release of an unknown volume from the south end of the site was reported by the station manager. The release contaminated a well and septic system on a property south of the site and gasoline odors were reported by the residence. In 1986, in response to the undocumented release, the site's original underground storage tanks (USTs) were replaced with four

double-walled gasoline and waste oil USTs. Upon removal, the USTs were reported in good condition based on low to non-detectable hydrocarbon concentrations in the soil samples. The engineering company recommended that no further action was necessary at the site, which was approved by the Shasta County Health Services Agency, Department of Public Health (Public Health Department), in 1987.

Four additional soil and groundwater investigations occurred between 1987 and 2004, all resulting in no further action. However, in February 2004, Phillips 66 issued a due diligence site assessment that resulted in the submittal of a UST Unauthorized Release/Site Contamination Report. Accordingly, the Public Health Department requested a work plan to further investigate groundwater impacts. In 2005, all USTs and pipelines were removed and reported in good condition, and therefore were not considered the source of contamination. In 2009, a Work Plan for Additional Soil and Groundwater Investigation was initiated and five groundwater monitoring wells were installed. Concentrations of petroleum hydrocarbons in the soil samples were found to be low to mostly non-detected in the laboratory reporting limits. As a result, the Public Health Department approved a monitoring reduction frequency from quarterly to semi-annual. Additionally, in 2014, soil sample concentrations for all constituents were less than the California Human Health Screening Level values. However, results of 2015 soil samples revealed a previously unidentified mass of methyl tertiary butyl ether (MTBE) in the soil (ATC, 2016).

The 5101 Churn Creek site is located northeast of the Strawberry Fields Site. The groundwater flows toward the south at a hydraulic gradient of 0.075 (ATC, 2016). However, groundwater model estimates that contamination is not crossing to the western side of I-5 nor is it entering the Sacramento River (Bergmann, 2017). Additionally, remediation plans are currently being developed in order to clean up the site. Therefore, due to the direction of the contamination flow, this site is not an environmental threat to the Strawberry Fields Site (**Appendix H**).

Current Hazardous Materials Involvement

The Strawberry Fields Site is currently undeveloped and used for seasonal cattle grazing. Accordingly, there is no existing hazardous materials involvement on the Strawberry Fields Site.

Off-site Access Improvement Areas

Both the North and South Access Improvement Areas are currently developed as roadways. Current hazardous materials involvement on the Off-site Access Improvement Areas include small quantities of chemicals typically found along roadways, such as motor oil, hydraulic fluid, and solvents. The amount and types of hazardous materials that are currently generated are common to roadways and do not pose unusual storage, handling, or disposal issues.

Database Search

The Phase I ESA described above analyzes a one-mile radius surrounding the Strawberry Fields Site, which encompasses the Off-site Access Improvement Areas. The Off-site Access Improvement Areas were not listed on any of the environmental databases for recorded leaks or known RECs. No RECs were identified on or in the immediate vicinity of the sites that would be likely to pose a significant impact to the environmental integrity of the Off-site Access Improvement Areas. However, as stated in **Appendix H**, the City of Redding Sunnyhill Sewer Lift Station, located on the western border of Sunnyhill Lane, is listed as a chemical storage facility by Certified Unified Program Agencies (CUPA). The lift station is in compliance and has no recorded violations or leaks (**Appendix H**; CalEPA, 2016).

Anderson Site

A desktop survey of the Anderson Site was performed and the site was surveyed from the property borders on December 22, 2016. The Anderson Site is currently undeveloped with a flat terrain and Oak Street bisects the property. There are scattered trees along the border of the Anderson Site. No visible signs of gross contamination were observed on the Anderson Site. As it is currently undeveloped, no hazardous materials involvement occurs on the Anderson Site.

Database Report

A record search was conducted by Environmental Data Resources, Inc. (EDR) in September 2016 to identify locations of past and current hazardous materials involvement on the Anderson Site (**Appendix H**). Numerous regulatory agency databases were searched for records of known storage tank sites, known sites of hazardous materials generation, storage, or contamination, or violations pertaining to storage and use of hazardous materials. Databases were searched for sites and listings up to 1.0 mile from the perimeter of the Anderson Site. EDR uses a geographical information system to plot locations of past and/or current hazardous materials involvement. The Anderson Site is not listed on any databases, however, there are several listings of potential hazardous waste effects within a 1.0-mile radius, as indicated in **Table 3.12-2**, which are discussed further below.

Hazardous Materials Sites

The three open leaking underground storage tank (LUST) cases within one mile of the Anderson Site are described below.

Morton's Texaco

The Morton's Texaco case, located 0.1 mile southeast of the Anderson Site. The case was opened as a result of an unauthorized release of gasoline from a UST in 1999. The unauthorized release from the UST system has since been stopped and corrective action directed by the Central Valley Regional Water Quality Control Board (CVRWQCB) is in progress. Correction actions involved in the case include site investigation, remediation, and monitoring, which have worked to reduce MTBE site concentrations and groundwater concentrations (SWRCB, 2017). Morton's Texaco is located approximately 0.1 mile

southeast of the Anderson Site and is eligible for closure, with an expected closure date of December 2018 (SWRCB, 2017).

TABLE 3.12-2
RESULTS OF HAZARDOUS MATERIALS DATABASE SEARCHES FOR THE ANDERSON SITE

Property	Proximity to Site	Cleanup Status	Potential Contaminants of Concern	Potential Media Affected	Database
RVS Unlimited – 2374 North St	<0.1 mile	Completed – Case Closed as of 1/29/1998	Gasoline	Well used for drinking water supply	EDR Hist Auto, LUST, HIST CORTESE, LUST, Notify 65
Unocal SS #5690 – 2411 North St	<0.1 mile	Completed – Case Closed as of 11/2/1995	Gasoline	Aquifer used for drinking water supply	LUST, Hist Cortese, Notify 65
Morton's Texaco – 2350 North St	<0.1 mile	Open – Eligible for Closure	Gasoline	Aquifer used for drinking water supply	LUST, Hist Cortese, EDR Hist Auto
Anderson Chevron/ JP Food Mart – 2298 North St	<0.1 mile	Open – Verification Monitoring	Gasoline	Aquifer used for drinking water supply	CUPA Listings, EDR Hist Auto, LUST, SWEEPS UST, HIST UST, UST
Shell SS Anderson Dotzenrod – 2030 North St	<0.25 mile	Completed – Case Closed 2017	Waste Oil/Motor/ Hydraulic/ Lubricating	Aquifer used for drinking water supply	Hist Cortese, LUST, SWEEPS UST, CUPA Listings
Beacon Station – 2071 North St	<0.25 mile	Completed – Case Closed 2012	Gasoline	Aquifer used for drinking water supply	LUST[1], Hist Cortese, SWEEPS UST, CUPA Listings,
Handi Spot Market – 2700 North Way	<0.25 mile	Completed – Case Closed 2012	Gasoline	Aquifer used for drinking water supply	LUST, Hist Cortese, SWEEPS UST, CUPA Listing
Eagan Property – 3110 West Center St	<0.25 mile	Open – Site Assessment	None specified	None specified	LUST
Pacific Bell – 2955 Oak St	<0.25 mile	Completed – Case Closed as of 1995	Diesel	Soil	RCRA-SQG, LUST, SWEEPS UST, FINDS, CUPA Listings, Hist Cortese, ECHO, Hist UST
Cheaper #92 – 3480 Center St W	<0.25 mile	Completed – Case Closed as of 2008	Gasoline	Aquifer used for drinking water supply	LUST, Hist Cortese, CUPA Listing, HAZNET, SWEEPS UST
Beacon Service Station – 2700 Gateway Rd	<0.5 mile	Completed – Case Closed as of 2017	Benzene, Gasoline, MTBE / TBA / Other Fuel Oxygenates and Gasoline	Aquifer used for drinking water supply	LUST[1], Haznet, Hist UST, CUPA Listings, Hist Cortese

Source: **Appendix H**.

Anderson Chevron / JP Food Mart

The Anderson Chevron and JP Food Mart are two listings at the same address, JP Food Mart has no recorded leaks and will not be discussed further. The Anderson Chevron is an active gas station and mini mart. The case was opened as a result of an unauthorized release of gasoline from a UST to an aquifer used for drinking water supply. The unauthorized release from the UST system has since been stopped

and corrective action directed by the CVRWQCB is in progress. Correction actions involved in the case include site investigation, remediation, and monitoring.

When tested, concentrations of MTBE were above the reporting limits and several monitoring wells are showing trends of increasing results. Additionally, tertiary-amyl methyl ether (TAME) and tertiary butyl alcohol (TBA) were also above the reporting limits in one monitoring well. Semi-annual groundwater monitoring will continue until otherwise directed by the CVRWQCB. However, results from well monitoring in August 2016 concluded that the contaminated groundwater flows toward the north-northeast at a hydraulic gradient of 0.002, away from the Anderson Site. Therefore, contamination from this site are not likely to reach the Anderson Site (SHN, 2016).

Eagan Property

Located 0.2 miles southwest of the Anderson Site, this site is open and involved a release to soil. The property was an old fueling station before it was purchased by the Eagan family. The Eagan family developed over the USTs without removing them, and the case was opened in 1995. Since then, limited studies, documentation, and remediation has taken place at the site. However, groundwater flows southeast from the Eagan Property, away from the Anderson Site. Therefore, the hazardous materials from the site are not likely to affect the Anderson Site (**Appendix H**).

Win-River Casino Site

A reconnaissance level survey for hazardous materials at the Win-River Casino Site was conducted on December 22, 2016. The Win-River Casino Site is currently developed with the Win-River Casino and associated facilities. The vicinity surrounding the site is dominated by residential developments. No evidence of leaks was noted during the December 22, 2016, site visit.

Database Report

A record search was conducted by EDR in June 2017 to identify locations of past and current hazardous materials involvement on the Win-River Casino Site (**Appendix H**). Numerous regulatory agency databases were searched for records of known storage tank sites, known sites of hazardous materials generation, storage, or contamination, or violations pertaining to storage, and use of hazardous materials. Databases were searched for sites and listings up to 1.0 mile from the perimeter of the Win-River Casino Site. EDR uses a geographical information system to plot locations of past and/or current hazardous materials involvement.

The Win-River Casino Site is listed on the Facility Index System (FINDS) and Enforcement and Compliance History Online (ECHO) databases for potential hazardous material involvement including storage of chemicals. However, no chemical releases have been reported (USEPA, 2017). Additionally, there are several listings of potential hazardous waste effects within a 1.0 mile radius, as indicated in **Table 3.12-3**, which are discussed further below.

TABLE 3.12-3
RESULTS OF HAZARDOUS MATERIALS DATABASE SEARCHES FOR THE WIN-RIVER CASINO SITE

Property	Proximity to Site	Cleanup Status	Potential Contaminants of Concern	Potential Media Affected	Database
Clear Creek Bank	<0.25 mile	Closed/Inactive	None specified	None specified	IHS Open Dumps
Verizon Wireless – 18041 Clear Creek Rd	<0.25 mile	Not reported	None specified	None specified	CUPA
Barnard Pipeline, Inc. – 8025 Eastside Rd	<0.5 mile	Not reported	None specified	None specified	CUPA
Schmitt, William, & Sylvia/Schmitt Lowbed Sev, Inc./Muse, Frank, & Katherine – 1701 Clear Creed Rd	<0.25 mile	No violations found	None specified	None specified	HIST CORTESE, FINDS, RCRA, ECHO
Schnitzer Steel Industries – 8031 Eastside Rd	<0.25 mile	Not reported	Scrap and waste materials	None specified	NPDES, CUPA
Applied Composites – 18094 Clear creek Rd	<0.25 mile	Not reported	Other organic solids	None specified	HAZNET, CUPA
Evergreen Environmental Services Redding – 501 Clear Creek Rd	<0.5 mile	Case Closed	None specified	None specified	HWP
Shorts Scrap Iron and Metal, Inc./Northstate Recycling – 2041 Girvan Rd	<0.5 mile	Open – Remediation as of 6/4/2012	Copper/Diesel, Lead/other metals/Waste Oil/Motor/Hydraulic/ Lubricating	Aquifer used for drinking, contaminated surface, sediments, soils, and surface water	LUST, HIST UST, HIST CORTESE, NPDES, SLIC, SWRCY, ENVIROSTOR, RESPONSE, AST, CUPA, PROC
Morgan Emultech Inc. – 7200 Pit Rd	<0.5 mile	Completed – Case Closed	None specified	None specified	LUST, HIST UST, SWEEPS UST, HIST CORTESE, NPDES, WDS, AST, CUPA
Clear Creek Market – 7036 Westside Rd	<0.5 mile	Completed – Case Closed as of 3/1/2001	Gasoline	Aquifer used for drinking water supply	LUST, HIST CORTESE, CUPA
Casey Vern – 6911 Eastside Rd	<0.5 mile	Completed - Case Closed as of 4/2/1991	Waste oil/motor/ hydraulic/lubricating	Aquifer used for drinking water supply	LUST, HIST CORTESE

Source: **Appendix H**.

Hazardous Materials Sites

The one open LUST cases within one mile of the Win-River Casino Site is described below.

Shorts Scrap Iron and Metal, Inc. / Northstate Recycling

The Shorts Scrap Iron and Metal Inc. and Northstate Recycling are two listing at the same address; the Shorts Scrap Iron and Metal Inc. case has been closed since 1997 and will not be discussed further. Northstate Recycling is located approximately 0.3 mile northeast of the Win-River Casino Site and has been shredding appliances since 2011. In 2012, they received a Notice of Violation stating that Northstate Recycling was in violation of the General Industrial Storm Water Permit. Samples collected

from the stormwater treatment system outfall pipe revealed suspended solids, metals, semi volatile organic compounds, total petroleum hydrocarbons, and total oil and grease were well above water quality objectives (CVRWQCB, 2012). The contaminated water was discharged directly to an unnamed tributary of Clear Creek. However, in 2012 Northstate Recycling installed an advanced stormwater treatment system to treat stormwater with flocculent before discharging it off site. Further remediation also includes plans to excavate buried wastes, which poses a threat to water quality, and install a groundwater monitoring system around the facilities. Northstate Recycling is down-gradient from the Win-River Casino Site; therefore, contamination from the site is unlikely to migrate to up-gradient to the Win-River Casino Site (**Appendix H**).

3.13 AESTHETICS

This section describes the existing environmental conditions related to aesthetics for the alternative sites described in **Section 2.2**. The general and site-specific descriptions of the aesthetic environment contained herein provide the environmental baseline by which direct, indirect, and cumulative effects are identified and measured in **Section 4.13**, **Section 4.14**, and **Section 4.15**, respectively.

3.13.1 AESTHETICS TERMINOLOGY

Viewshed Characteristics

A viewshed is the geographical area that is visible from at least one location, referred to as a viewpoint. Each viewpoint provides a line-of-sight of the viewshed. The viewshed is comprised of the following elements:

- **Clarity in Line of Sight**—the overall visibility of the object within the viewshed, influenced by such factors as trees, buildings, topography or any other potential visual obstruction within the viewshed;
- **Duration of Visibility**—the amount of time the object is exposed to viewers within the viewshed. For example, a passing commuter will experience a shorter period of viewing time than a resident within the viewshed;
- **Proximity of the Viewer**—the effects of foreshortening due to the distance of the viewer from the object will influence the dominance of the object in the perspective of the viewer within the viewshed; and
- **Number of Viewers**—the number of viewers anticipated to experience the visual character of the object in forward-oriented view (i.e., not through a rear-view mirror). A densely populated residential district or a busy highway within the viewshed of the object would present more viewers than unpopulated areas.

Viewsheds and viewpoints are described by expressing the strength of the viewing experience, framed within the analytical criteria listed above. While the viewing experience is personal and subjective in nature, the application of the above criteria allows for an objective, baseline assessment of the visual environment and subsequent visual impacts.

Scenic Resources

There is no comprehensive list of specific features that automatically qualify as scenic resources; however, certain characteristics can be identified that contribute to the determination of a scenic resource. The following is a partial list of visual qualities and conditions that if present, may indicate the presence of a scenic resource:

- A tree that displays outstanding features of form or age;

- A landmark tree or a group of distinctive trees accented in a setting as a focus of attention;
- An unusual planting that has historical value;
- A unique, massive rock formation;
- An historic building that is a rare example of its period, style, or design, or that has special architectural features and details of importance;
- A feature specifically identified in applicable planning documents as having a special scenic value;
- A unique focus or a feature integrated with its surroundings or overlapping other scenic elements to form a panorama; or
- A vegetative or structural feature that has local, regional, or statewide importance.

3.13.2 REGULATORY SETTING

Shasta County General Plan

The Shasta County General Plan, as amended through September 2004, outlines growth and development goals within the unincorporated County over a 20-year period (Shasta County, 2004). The Shasta County General Plan is organized into three groups, including the Community Development group, which consists of design recommendations. County General Plan strategies and policies related to visual resources that may be applicable to the Strawberry Fields Site are listed below:

- **DR-1**: Promote a visually appealing developed environment in urban, suburban, town center, mixed use, and rural residential settings.
- **DR-2**: Provide the County's communities the opportunity to develop their individual and local character, as reflected by citizens involved in their planning process.

Shasta County Zoning Code

Components of the Shasta County Zoning Code relevant to the topic of aesthetics include landscaping, lighting, and signage, as described below.

The Shasta County Zoning Code 17.84.040 (Landscaping) provides development standards requiring that parking areas shall landscape a minimum of five percent of the gross lot area including one tree, of a species suited to the area climate zone, for every eight parking spaces. Additionally, a parking area that abuts a freeway shall have a 10-foot wide screened landscaped strip adjacent to the right-of-way, which includes trees planted on 40-feet-on-center spaces, with a minimum of 3 trees. All planted areas shall be served with permanent watering systems and maintained in a living condition.

The Shasta County Zoning Code 17.84.050 (Lighting) provides development standards requiring that all exterior and interior lighting be designed and located so that it is confined to the premises. A light source cannot shine on or illuminate directly on any surface other than the area required to be lighted. No

lighting can be in a location that causes a hazard to vehicular traffic, either on private property or on abutting streets.

The Shasta County Zoning Code 17.84.064 (Prohibited Signs) provides development standards requiring that signs with any moving, rotating, flashing or animated light are prohibited. Additionally, a use permit for all signs except those listed under Shasta County Zoning Code 17.84.62 (Sign Permit Requirements), shall require a use permit.

City of Redding General Plan

Although the Strawberry Fields Site is located outside the incorporated boundaries of the City, the North Access Improvement Area is within the City boundary. The City Council adopted the City General Plan on October 3, 2000. The City General Plan outlines policies, standards, and programs to guide day-to-day decisions concerning the City's development through the year 2020. The City General Plan consists of 10 elements, including a Community Development and Design element (City of Redding, 2000). **Table 3.13-1** depicts the City General Plan goals and policies related to visual resources that may be applicable to the North Access Improvement Area.

TABLE 3.13-1
CITY OF REDDING APPLICABLE GENERAL PLAN GOALS AND POLICIES

Goals and Policies	City of Redding Planning Goals
Goal CDD3	Ensure a proper balance between development areas and the natural environment.
Policy CDD3C	Preserve natural corridors and linkages between habitat types through project design, key open-space acquisitions, floodplain and slope dedications and easements, conservation easements, and similar mechanisms.
Goal CDD5	Ensure a proper relationship between stream corridors and urban development.
Policy CDD5A	Establish appropriate development standards along stream corridors in order to promote the aesthetic value of the adjacent natural area.
Policy CDD7A	Protect the visual integrity of prominent ridge lines that can be viewed from key public gathering areas, the river, visitor destinations, and community gateways. Utilize one or more of the following measures to avoid or minimize development impacts: (1) public or private purchase of lands, the use of conservation easements, or similar measures; or (2) performance standards, including limitations on building heights and/or increased ridge-line setbacks and standards for use of appropriate building forms, colors, and materials that blend into their surroundings.
Goal CDD14	Encourage project development which is compatible with surrounding properties and which improves the image of the City.
Goal CDD15	Strike a balance between business needs to identify their location to the traveling public and the impacts to the street scene that can result from excess or poorly designed signage.
Policy CDD15A	Ensure that the City's Sign Ordinance adequately addresses allowable sign area, placement, and design parameters for signs.
Goal CDD16	Improve the visual attractiveness of the City's arterial and collector streets; improve pedestrian safety.
Policy CDD16C	Utilize street tree-planting as a unifying visual element along the streets; establish a street tree-planting and maintenance program.
Source: City of Redding, 2000.	

City of Anderson General Plan

Anderson's General Plan was approved in 2007 with a stated purpose to plan for needed growth while protecting the "small town" feel of Anderson. The Open Space and Conservation Element in the General Plan contains policies and implementation measures related to visual resources. **Table 3.13-2** depicts the City of Anderson's policies and implementation measures that may be applicable to the Anderson Site.

TABLE 3.13-2
CITY OF ANDERSON APPLICABLE GENERAL PLAN POLICIES AND IMPLEMENTATION MEASURES

Policies and Implementation Measures	City of Anderson Planning Policies
Policy SRP-1	Encourage preservation and enhancement of views of the Sacramento River and Mount Shasta and Mount Lassen to the extent possible.
Policy SRP-2	New development and redevelopment along the Sacramento River and throughout the City should take advantage of view opportunities.
Policy SRP-3	Encourage preservation of trees and landscaping as a scenic resource.
Implementation Measure SRI-2	Review development applications for discretionary actions to determine aesthetic impacts and visual compatibility with surrounding property.
Implementation Measure SRI-4	Work with applicants to implement heritage and scenic tree preservation mitigation plans for each development.
Source: City of Anderson, 2007.	

City of Anderson Zoning Code

Components of the City of Anderson Zoning Code (Title 17 of the Code of Ordinances) relevant to the topic of aesthetics include landscaping, lighting, and signage, as detailed below (City of Anderson, 2017d).

City of Anderson Zoning Code 17.46.030(K) (Planters and Landscaped Areas): "A planter or landscaped area at least four feet wide shall be provided adjacent to all street rights-of-way. In addition, any area within the street right-of-way between the sidewalk and outer edge of the right-of-way shall be developed as a planter or landscaped area in conjunction with the required four-foot area above, unless this requirement is waived by the director of public works or his designee. Where a public parking area has a capacity of more than ten parking spaces, it shall provide landscaped areas, in addition to the required parking area and planter or landscaped area, equal to at least five percent of the total parking area. Within the planter or landscaped area, an irrigation system and live landscaping shall be provided and maintained. Not more than thirty percent of the planter or landscaped area may be covered with hard surfaces such as gravel, landscaping rock, concrete or other impervious materials."

The City of Anderson Zoning Code 17.04.466 (Lighting): This section of the municipal code provides development standards requiring that all architectural lighting be fully shielded to prevent light dispersion

or direct glare to shine above a 90-degree horizontal plane from the base of the light fixture, and includes the following provisions for off-street lighting:

- "Off-street parking areas for nonresidential uses providing parking spaces for use by the general public shall be provided with a maintained minimum of one foot-candle of light on the parking surface from dusk until the termination of business every operating day. Such lighting, which would cause unreasonable annoyance to occupants of the neighboring properties or otherwise interfere with the public health, safety or welfare, shall be so arranged as to reflect light and glare away from adjoining premises and streets.
- Ground-mounted light poles serving parking areas shall be located within a planter or incorporated into a walkway or other pedestrian area. A ground-mounted light pole with a concrete pedestal greater than six inches above grade, which is not screened by vegetation, shall incorporate pedestal design enhancements (e.g., raised relief, textured, exposed aggregate or like treatment)" (City of Anderson, 2017d).

City of Anderson Zoning Code 17.44.040(A) (Prohibited Signs): This section of the municipal code prohibits signs with flashing, moving, or intermittent lighting. Signs that create a safety hazard, or are erected on the roof of a building, are also prohibited.

3.13.3 ENVIRONMENTAL SETTING

Strawberry Fields Site

The Strawberry Fields Site is currently undeveloped and lies on the outskirts of the City of Redding. The approximately 232-acre property is comprised of 7 tax parcels and is bound by Bechelli Lane to the north, the Sacramento River to the west, agricultural property to the south, and Interstate 5 (I-5) to the east. The topography surrounding the Strawberry Fields Site is generally flat and typical views of the area are of pasture lands, the Sacramento River, and rural residences with long-range views of coastal mountains to the west and the Klamath Mountain Range to the north, including distant views of Lassen Peak and Mt. Shasta. The nearest residential sensitive receptors to the Strawberry Fields Site include:

- Rural residential housing located north of the northern project boundary near the Sacramento River (the nearest of which is 150 feet from the site); views from these residences to the site are mostly impeded by existing vegetation located along the northern site boundary.
- A residential subdivision is located directly across the river, approximately 330 feet from the southwestern site boundary; views from these residence of the development areas within the site are obstructed by dense vegetation located along the Sacramento River and the topography of the site.
- A rural residence that borders the southeast corner of the site. This residence and other surrounding residences have partially blocked views of the Strawberry Fields Site as scattered vegetation obstruct these views.

Additionally, the Strawberry Fields Site can be viewed by vehicles traveling along I-5 as well as surface streets, including Smith Road and Bechelli Lane. The presence of mature trees along the southwestern and southern borders screen long range views of the site.

Description of Viewsheds

Selected viewshed locations are shown on **Figure 3.13-1** and photographs of the Strawberry Fields Site and its surroundings are shown in **Figure 3.13-2**. The locations of these individual viewpoints were selected based on their coverage of the site and overall representation of typical viewsheds in the vicinity of the Strawberry Fields Site. The following are brief descriptions of the depicted viewpoints.

Viewpoint A

This north-facing photograph was taken from the intersection of Greenfield Street and Smith Road. It depicts a typical view of cleared fields used for livestock grazing, from the perspective of residences along Smith Road.

Viewpoint B

This northwest-facing photograph was taken along I-5 facing the northern portion of the Strawberry Fields Site. It depicts a typical view of I-5 and the adjacent heavily vegetated land, with long-range views of coastal mountains and the Klamath Mountain Range, from the perspective of a motorist traveling along I-5.

Viewpoint C

This south-facing photograph was taken from Bechelli Lane north of the Strawberry Fields Site. It depicts a typical long-range view of trees and overhead power lines from the perspective of commercial buildings in the vicinity.

Viewpoint D

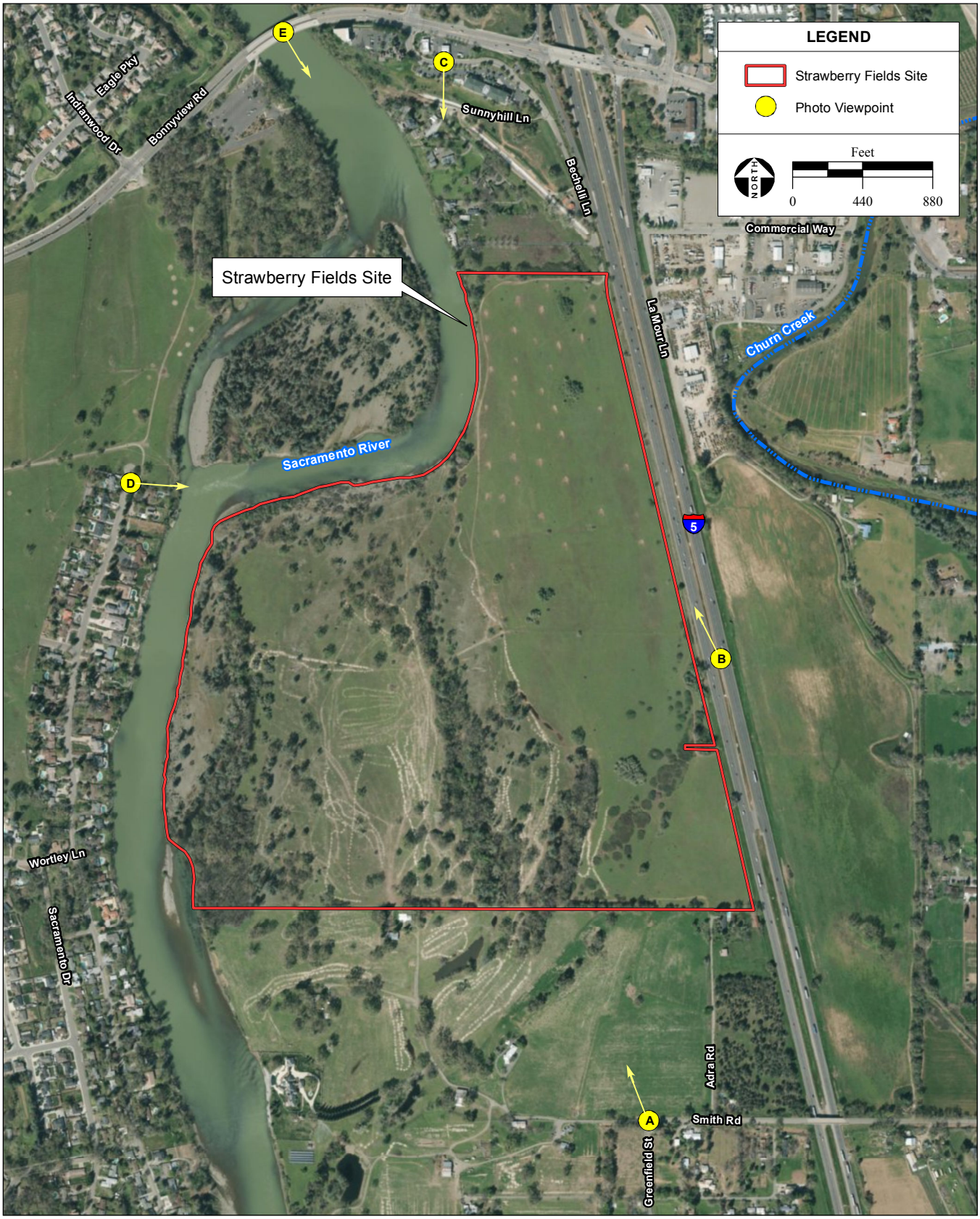
This east-facing photograph was taken from Riverside Drive, across the Sacramento River. It depicts a typical long-range view of the cleared fields and trees from the perspective of the subdivision on the western bank of the Sacramento River.

Viewpoint E

This southeast-facing photograph was taken from South Bonnyview Road, north of the Strawberry Fields Site. It depicts a view of the Sacramento River bordered by heavy vegetation and long range views of agricultural properties.

Scenic Highways

There are no state-designated scenic highways or roads adjacent to the Strawberry Fields Site. The closest scenic highway is a County-designated scenic highway, State Route 151 (SR-151), located 11



SOURCE: USDA aerial photograph, 7/26/2014; ESRI Data, 2016; AES, 7/18/2018

Figure 3.13-1

Strawberry Fields Site Viewshed Photograph Locations

VIEW A - Facing north toward the Strawberry Fields Site.

VIEW B - Facing northwest toward the Strawberry Fields Site.

VIEW C - Facing south toward the Strawberry Fields Site.

VIEW D - Facing east toward the Strawberry Fields Site.

VIEW E - Facing southeast toward the Strawberry Fields Site.

SOURCE: AES, 7/18/2018

Figure 3.13-2
Strawberry Fields Site Viewshed Photographs

miles north of the Strawberry Fields Site, near Shasta Lake (Caltrans, 2017). Therefore, scenic highways are not discussed further in this Environmental Impact Statement (EIS).

Shadow, Light, and Glare

No significant lighting, shadow, or glare is currently emitted from the Strawberry Fields Site. During the day, sunlight reflecting from nearby structures and motor vehicles is the primary source of glare. The principal sources of nighttime light and glare includes streetlights and vehicle headlights from traffic on I-5 immediately east of the Strawberry Fields Site, as well as residences and commercial buildings north of the Strawberry Field Site. The Strawberry Fields Site does not contain unusually bright or uniquely noticeable lighting that affects area residents.

Off-site Access Improvement Areas

North Access Improvement Area

The North Access Improvement Area is located north of the Strawberry Fields Site along Bechelli Lane, and is bound by I-5 to the east, South Bonnyview Road to the north, open land and commercial building to the west, and the Strawberry Fields Site to the south. Typical views of the vicinity are similar to those described above under the Strawberry Fields Site. The site can be viewed by vehicles traveling along I-5, Churn Creek Road, and adjacent residences and businesses. The nearest residences are located approximately 700 feet to the west. However, the residences have partially blocked views of the North Access Improvement Area as mature trees obstruct their view.

South Access Improvement Area

The South Access Improvement Area is located south of the Strawberry Fields Site, along a private access road (referred to as Adra Road on certain County maps) and is bound by the Strawberry Fields Site to the north, rural residences to the east and south, and open agricultural land to the west. Typical views of the vicinity are similar to those described above under the Strawberry Fields Site. The presence of mature trees partially blocks views of the South Access Improvement Area from rural residential receptors located directly to the east.

Description of Viewsheds

The North Access Improvement Area can be viewed from vehicles traveling along I-5 as well as Bonnyview Road. Views of the North Access Improvement Area from these viewsheds include a typical local street with adjacent commercial buildings and scattered vegetation. The South Access Improvement Area can be viewed from nearby residences as well as by vehicles traveling along I-5. These viewsheds depict a typical view of a rural driveway with adjacent scattered residences and cleared fields.

Shadows, Light, and Glare

During the day, sunlight reflecting from the adjacent structures and motor vehicles on Bechelli Lane is the primary source of glare and shadow. The principal sources of nighttime light and glare include streetlights and vehicle headlights travelling along Bechelli Lane as well as lights emitted from the adjacent building. Private residences along the South Access Improvement Area emit minimal light, glare and shadows. Accordingly, the Off-site Access Improvement Areas do not contain unusually bright or uniquely noticeable lighting that affects area residents.

Anderson Site

Regional Context

The Anderson Site is currently undeveloped and contains mostly grasslands and occasional vegetation. On-site vegetation includes shrubs, grasses, and trees. The topography of the site is flat with an elevation of approximately 415 feet above mean sea level (amsl). The immediate vicinity surrounding the Anderson Site is dominated by residential and commercial developments. The northern and southern areas adjacent to the site are designated as commercial and single family residential areas. I-5 is located immediately to the east and lands to the west are zoned as single family residential.

Description of Viewsheds

Selected viewshed locations are shown on **Figure 3.13-3** and photographs of the Anderson Site and its surroundings are shown in **Figure 3.13-4**. The locations of these individual viewpoints were selected based on their coverage of the site and overall representation of typical viewsheds in the vicinity of the Anderson Site. The following are brief descriptions of the depicted viewpoints.

Viewpoint A

This northeast-facing photograph was taken from the end of Nathan Drive. It depicts a typical view of local suburban residences with tall trees in the background, from the perspective of residences along Nathan Drive.

Viewpoint B

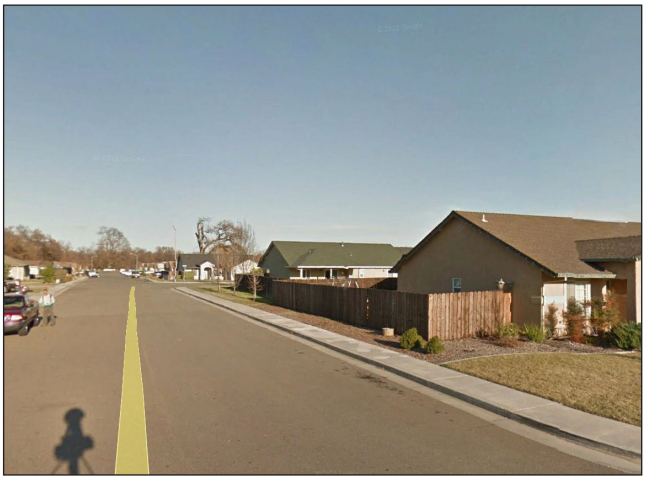
This northwest-facing photograph was taken across I-5. It depicts a view of the on-site open field obstructed by heavy vegetation from the perspective of a motorist traveling along I-5.

Viewpoint C

This south-facing photograph was taken from the parking lot of Camping World of Redding. It depicts a view of a parking lot with tall trees in the background, blocking views of the Anderson Site, from the perspective of commercial businesses north of the Anderson Site.

SOURCE: USDA aerial photograph, 7/26/2014; ESRI Data, 2016; AES, 7/18/2018

Figure 3.13-3
Anderson Site Viewshed Photograph Locations



VIEW A - Facing northeast toward the Anderson Site.

VIEW C - Facing south toward the Anderson Site.

VIEW B - Facing northwest toward the Anderson Site.

SOURCE: AES, 7/18/2018

Figure 3.13-4
Anderson Site Viewshed Photographs

Shadows, Light, and Glare

Existing light sources within the Anderson Site and in the general vicinity are fairly typical of residential and undeveloped land. No significant lighting, shadow, or glare is currently emitted from the Anderson Site. However, during the day, sunlight reflecting from nearby structures and motor vehicles are the primary source of glare. The principal sources of nighttime light and glare are vehicle headlight illumination from I-5 and State Route 273 (SR-273), streetlights, and nearby building lighting, including street lights from Camping World. The Anderson Site does not contain unusually bright or uniquely noticeable lighting that affect area residents.

Win-River Casino Site

Regional Context

The Win-River Casino Site is currently developed with Tribe's existing Win-River Casino. The topography of the site is flat with an elevation of approximately 468 feet amsl. The vicinity surrounding the site is dominated by residential developments. Immediately to the north is Clear Creek and SR-273 is directly to the east. The housing units on the current Rancheria trust land and the Cottonwood Canal are located directly to the south of the Win-River Casino Site.

Description of Viewsheds

Selected viewshed locations are shown on **Figure 3.13-5** and photographs of the Win-River Casino Site and its surroundings are shown in **Figure 3.13-6**. The locations of these individual viewpoints were selected based on their coverage of the site and overall representation of typical viewsheds in the vicinity of the Win-River Casino Site. The following are brief descriptions of the depicted viewpoints.

Viewpoint A

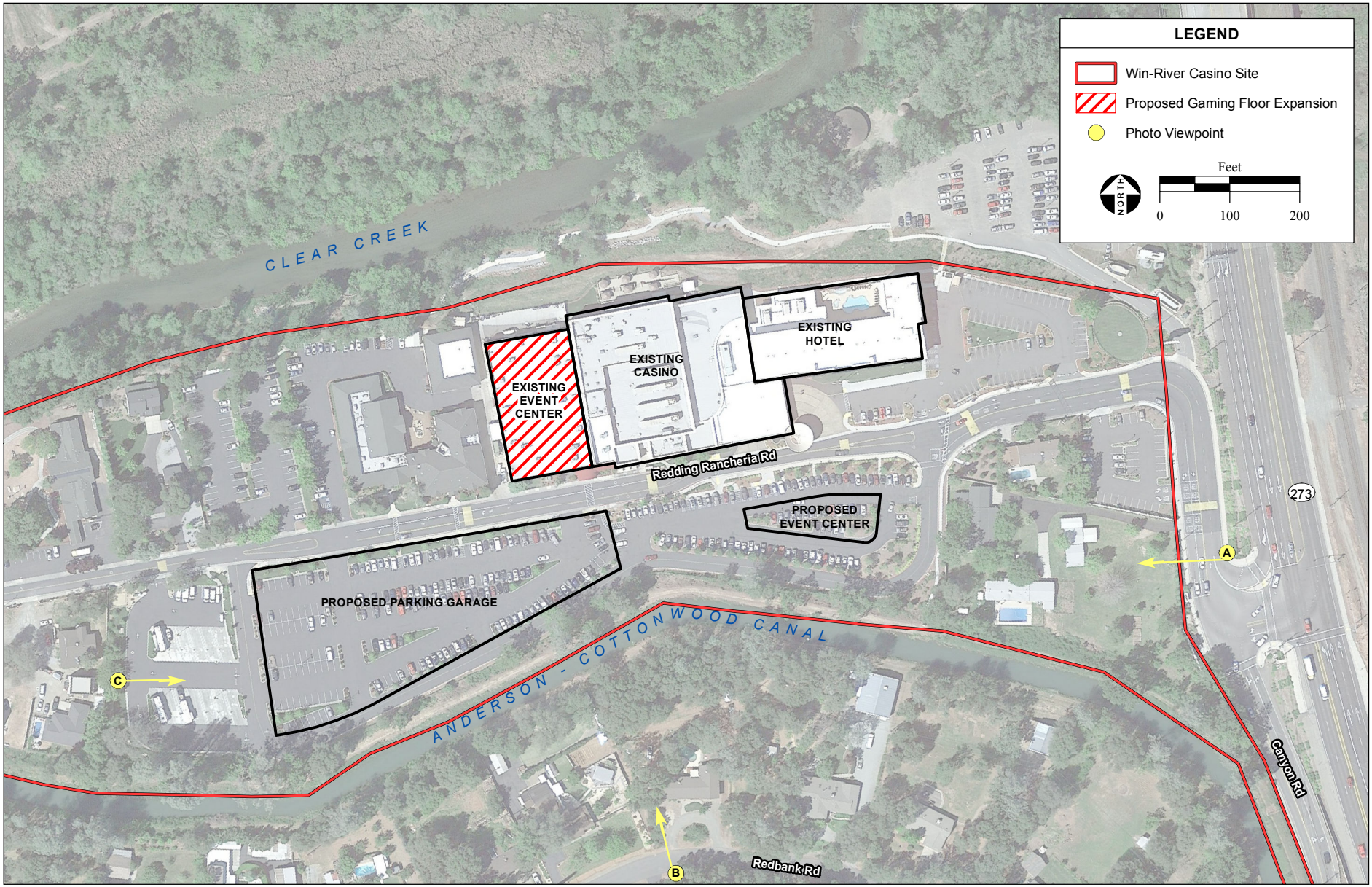
This west-facing photograph was taken from the Canyon Road near the entrance of the Win-River Casino. It depicts a view of a sound wall and the existing Win-River Casino, from the perspective of vehicles travelling along SR-273.

Viewpoint B

This north-facing photograph was taken along Redbank Road. It depicts a view of a dense mature trees, houses, and fences, which block views of the existing Win-River Casino Site from the perspective of the residences south of the Win-River Casino Site.

Viewpoint C

This east-facing photograph was taken from tribal residences along the edge of the casino parking lot. It depicts a typical view of the Win-River Casino parking lot, from the perspective of on-Reservation residences west of the Win-River Casino.



SOURCE: DigitalGlobe Aerial Photograph, 4/2015; AES, 7/18/2018

Figure 3.13-5

Win-River Casino Site Viewshed Photograph Locations

VIEW A - Facing west toward the Win-River Site.

VIEW B - Facing north toward the Win-River Site.

VIEW C - Facing east toward the Win-River Site.

SOURCE: AES, 7/18/2018

Figure 3.13-6
Win-River Casino Site Viewshed Photographs

Shadows, Light, and Glare

The existing Win-River Casino currently emits light, shadow, and glare. During the day, sunlight reflecting from structures and motor vehicles in the parking lot is the primary source of glare. The principal sources of nighttime light and glare are vehicle headlamp illumination from SR-273, streets lights located in the adjacent residential subdivisions, and Casino lighting.