

SECTION 3.0

AFFECTED ENVIRONMENT

CHAPTER 3.0 AFFECTED ENVIRONMENT

This chapter describes the existing environment of the area that may be affected by the Los Coyotes Casino Project, as required by CEQ Regulations (40 C.F.R. § 1502.15). Descriptions include land resources, water resources, air quality, biological resources, cultural and paleontological resources, socioeconomic conditions and environmental justice, transportation/circulation, land use, public services, noise, hazardous materials, and aesthetics. The existing conditions described herein provide the baseline for determining the environmental effects identified in **Chapter 4.0**.

3.1 LAND RESOURCES

This section describes the existing land resources for the proposed Barstow and Los Coyotes sites. The general and site-specific profiles of land resources contained herein provide the environmental baseline by which direct, indirect, and cumulative environmental effects are identified and measured in **Chapter 4.0**.

3.1.1 GENERAL ISSUES

Soils

Soil Surveys

Soil surveys for the San Bernardino County and San Diego County areas were published by the Natural Resource Conservation Service (NRCS), in 1986 and 1979, respectively. Each survey maps soil units and provides a summary of major physical characteristics for each unit with management recommendations. General data on capability classes is presented in **Table 3.1-1** below. Soil characteristics specific to each site are presented in the following sections.

In the Land Capability Classification System used by the NRCS, soils are grouped according to soils capability class. A soils capability class indicates limitations on practical use for food, fiber, or forage production. Classes are designated by Roman numerals I through VIII, with each class containing soils that are enough alike to require similar management. Additional coding by subclass is indicated by lower case letters, which designate the restrictions of soil groups within each class.

Expansive Soils

Clay particles can swell by absorbing large amounts of water relative to their volume. When these particles dry out, they shrink. Then, when rain falls on the dry, cracked ground, the clays swell, the cracks close, and the ground can rise several inches (JCP, 2001). The potential for soils to demonstrate expansive properties is primarily dependent upon clay content.

TABLE 3.1-1
SOILS CAPABILITY CLASSES

Capability Class	Definition
Class I	Soils have few limitations that restrict their use; the least restricted class.
Class II	Soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.
Class III	Soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.
Class IV	Soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.
Class V	Soils are not likely to erode but have other limitations, impractical to remove, that limit their use.
Class VI	Soils have severe limitations that make them generally unsuitable for cultivation.
Class VII	Soils have very severe limitations that make them unsuitable for cultivation.
Class VII	Soils and landforms restricted to use as recreation, wildlife, water supply or aesthetic purposes.
Capability Subclass	Definition
e	Soils have erosion problems.
w	Soils have wetness problems.
s	Soils have root zone limitations.
c	Soils have climatic limitations.
Source: NRCS, 2006	

Soil Corrosivity

Corrosion is an electrochemical process affecting degradation of metals or metal-containing materials in contact with water. Rates of corrosion vary depending on the acidity of the water, its electrical conductivity, oxygen concentration, and temperature. Both ground and surface water can be acidic. Surface water tends to have higher oxygen concentrations than groundwater. Groundwater tends to be more insulated from temperature variation than surface water.

Generally, corrosion occurs on structures that are exposed to several types of environments or electrolytes. Such electrolytes include raw and treated water, salt water and fresh water, various soils, rainwater, and airborne contaminants. These electrolytes serve to complete electrochemically corrosive circuits between different metals within the same environment. The flow of electrical current in the corrosion circuit is proportionate to the loss of metal in the corrosion process. Ferrous materials corrode at the rate of 20 pounds per ampere-year. Corrosion could compromise structural integrity in a building not designed to withstand corrosive soils.

Seismic Considerations

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act is a California state law passed in direct response to the 1971 San Fernando earthquake, which was associated with extensive surface fault ruptures that damaged numerous homes, commercial buildings, and other structures. The act requires the State Geologist to delineate “Earthquake Fault Zones” along faults that are “sufficiently active” and “well defined.” A sufficiently active fault is defined as one that has evidence of Holocene surface displacement. A fault is considered well defined if its trace is clearly detectable as a physical feature at or just below the ground surface. Both of these features must be present for a fault to be zoned under the Alquist-Priolo Earthquake Fault Zoning Act (CGS, 2007).

Seismic Intensity: The Modified Mercalli Intensity Scale

The Modified Mercalli Intensity (MMI) scale (**Table 3.1-2**) is a common measure of earthquake effects due to ground shaking intensity. The MMI values for intensity range from I (earthquake not felt) to XII (damage nearly total), with damage levels representing the estimated overall level of damage that will occur for various MMI intensity levels. Intensities ranging from IV to X could cause moderate to significant structural damage. The damage, however, will not be uniform. Some buildings will experience substantially more damage than the overall level, and others will experience substantially less damage. The age, material, type, method of construction, size, and shape of a building all affect its performance.

Magnitude

On a Richter Scale, the magnitude of an earthquake is determined from the logarithm of the amplitude of waves recorded by seismographs, with adjustments made for the distance between the seismograph and the epicenter of the earthquake. Magnitude is expressed in whole numbers and decimal fractions. A magnitude 5.3 would be a moderate earthquake, and a strong earthquake could be a magnitude 6.3. Because of the logarithmic basis of the scale, each whole number increase in magnitude represents a tenfold increase in measured amplitude, which corresponds to the release of about 31 times more energy.

Earthquakes with magnitude of about 2.0 or less are usually called microearthquakes. They are typically recorded only on local seismographs and usually not felt by people. Events with magnitudes of about 4.5 or greater are strong enough to be recorded by sensitive seismographs all over the world. Events with magnitudes of 8.0 or higher, such as the 1964 Good Friday earthquake in Alaska, are considered great earthquakes. The Richter scale is not used to express damage (USGS, 2006).

TABLE 3.1-2
MODIFIED MERCALLI INTENSITY SCALE

Intensity Value	Intensity Description	Average Peak Acceleration
I.	Not felt except by a very few persons under especially favorable circumstances.	< 0.0015 g ^a
II.	Felt only by a few persons at rest, especially on upper floors on buildings. Delicately suspended objects may swing.	< 0.0015 g
III.	Felt quite noticeably indoors, especially on upper floors of buildings, but many persons do not recognize it as an earthquake. Standing motorcars may rock slightly. Vibration similar to a passing of a truck. Duration estimated.	< 0.0015 g
IV.	During the day felt indoors by many, outdoors by few. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motorcars rocked noticeably.	0.015 g-0.02 g
V.	Felt by nearly everyone, many awakened. Some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.	0.03 g-0.04 g
VI.	Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.	0.06 g-0.07 g
VII.	Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motorcars.	0.10 g-0.15 g
VIII.	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motorcars disturbed.	0.25 g-0.30 g
IX.	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.	0.50 g-0.55 g
X.	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from riverbanks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.	> 0.60 g
XI.	Few, if any, (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.	> 0.60 g
XII.	Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted. Objects are thrown upward into the air.	> 0.60 g
Note: ^a g is gravity = 980 centimeters per second squared. Source: Bolt, 1988.		

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 ground water. Liquefaction potential has been found to be greatest where the groundwater is within a depth of 50 feet or less, and submerged loose, fine sands occur within that depth. Liquefaction potential decreases with larger soil particle size and greater depth to groundwater, and increases with greater ground acceleration and longer duration of shaking.

Lateral Spreading

Lateral spreading can occur during a seismic event in the form of horizontal ground displacement, and is typical where 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.

3.1.2 BARSTOW SITE

Geological Setting

The Barstow site lies within San Bernardino County, which is situated in the Mojave Desert Geomorphic Province (**Figure 3.1-1**). This geomorphic province occupies approximately 25,000 square miles and is bounded by the San Andreas Fault and the Transverse Ranges to the west, the Garlock Fault and the Tehachapi Mountains to the north (in Kern County), the Nevada State line to the east, and the San Bernardino/Riverside County boundary to the south. Portions of Los Angeles and San Bernardino Counties lie within this province. Erosional features such as broad alluvial basins that receive non-marine sediments from the adjacent uplands dominate the Mojave Desert region. Numerous playas, or ephemeral lakebeds within internal drainage basins, also characterize the region. Throughout this province, small Hills (some the remnants of ancient mountainous topography) rise above the valleys that are surrounded by younger alluvial sediments. The highest elevation approaches 4,000 feet above mean sea level (amsl), and most valleys lie between 2,000 to 4,000 feet amsl (SCAG, 2003).

Topography

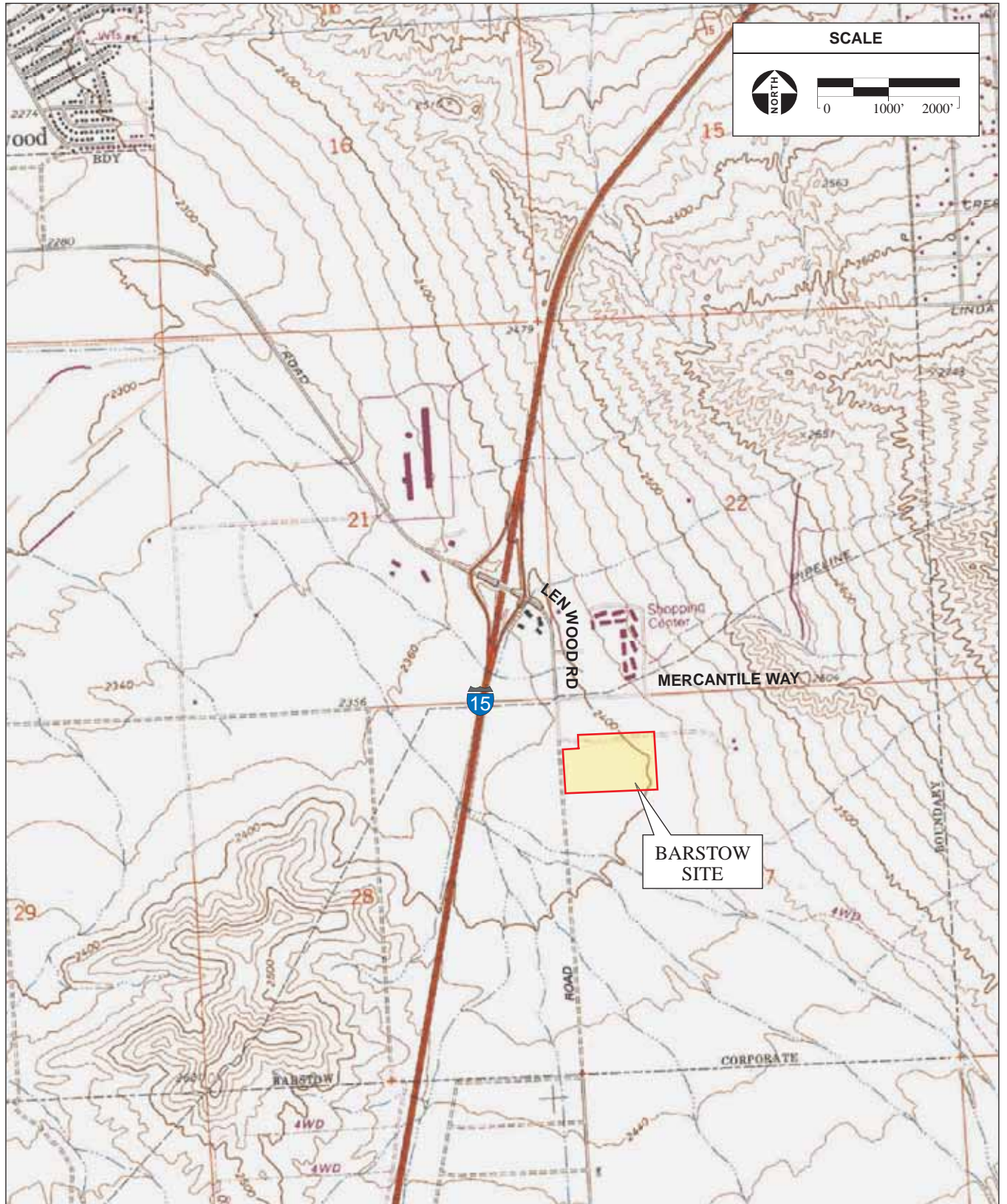
Figure 3.1-2 shows the topography of the Barstow site. Elevations on the Barstow site range from approximately 2,413 feet amsl at the eastern property line, to approximately 2,392 feet amsl at the western property line. The mean slope is 1.5 percent, with the rise distributed more densely over the eastern portion of the run.

Soils and Geology

As shown on **Figure 3.1-3**, the Barstow site is comprised of Cajon Sand soils. The Cajon series generally consist of mixed thermic, sandy entisols, or torripsamments. These are deep, excessively drained soils



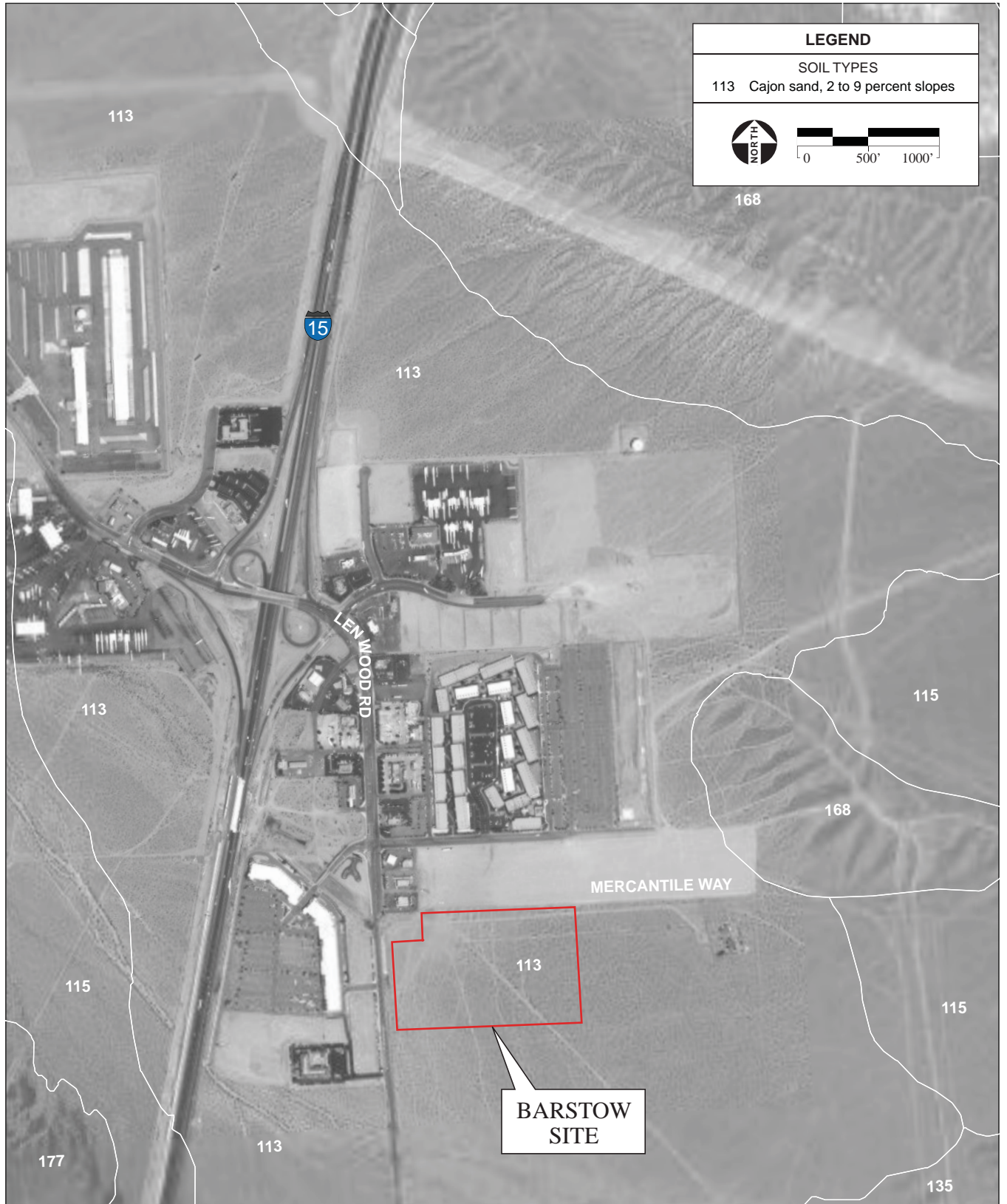
Figure 3.1-1
California Geomorphic Provinces



SOURCE: "Barstow, CA" USGS 7.5 Minute Topographic Quadrangle, Section 27, T9N, R2W, San Bernadino Baseline & Meridian; AES, 2009

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Figure 3.1-2
Barstow Site Topography



SOURCE: USDA Soil Conservation Service, 1975-1978;
 GoogleEarth, 2006; AES, 2009

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Figure 3.1-3
 Barstow Site Soils

found primarily on alluvial fans, and at elevations of 1,800-3,500 feet (USDA, 1986). The Barstow site's soil capability subclasses and limitations are outlined in **Table 3.1-3**. Soils on the site are not prone to expansion or corrosivity.

TABLE 3.1-3
PROJECT SOIL LIMITATIONS - BARSTOW SITE

Soils	Depth	Permeability	Drainage	Erosion	Shrink/Swell	Runoff	Capability Sub-class
Cajon Sand 2-9% slope	60 Inches	Rapid	Excessively Drained	Slight to moderate	Low	Slow	IIIe-1

Source: USDA, 1986.

Seismicity

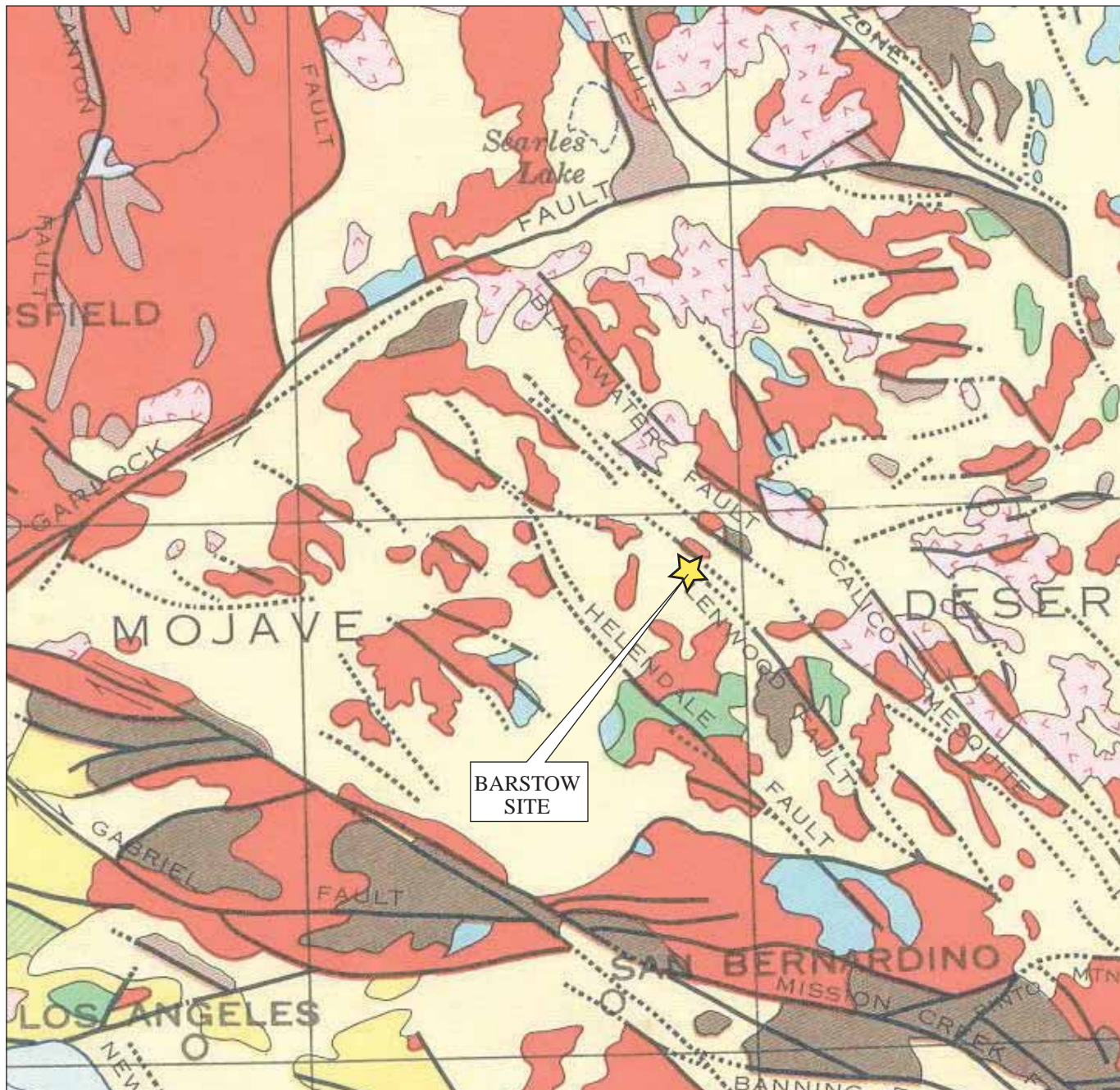
The Barstow site is located in a seismically active region (**Figure 3.1-4**). The Lenwood Fault, which runs diagonally from northwest to southeast across the City of Barstow, is a right-lateral strike-slip fault that is somewhat segmented. Although it has not produced any historic earthquakes, its Holocene displacement (less than 11,000 years) qualifies it as a "sufficiently active" fault, capable of producing a 7.5 magnitude earthquake. While the Lenwood Fault is on the California Department of Conservation's list of Alquist-Priolo Fault Zones, the Barstow site is a sufficient distance (greater than 500 feet) from the fault and is therefore not considered to be within an Alquist-Priolo Fault Zone. There are no documented faults directly beneath the Barstow site (USGS and CGS, 2006).

The U.S. Geological Survey (USGS) has mapped the region by maximum peak acceleration based on historic groundshaking events and regional faulting. **Figure 3.1-5** shows that the Barstow site is located within a region having a 10 percent chance of exceeding 0.25g acceleration in a seismic event, to which **Table 3.1-2** assigns a corresponding MMI Intensity Value of VIII. At this level of acceleration, damage is slight in specially designed structures and considerable in ordinary substantial buildings, with partial collapse (Bolt, 1988). Peak ground accelerations associated with faults in the vicinity of the Barstow site are summarized in **Table 3.1-4**.

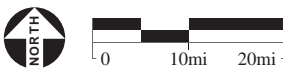
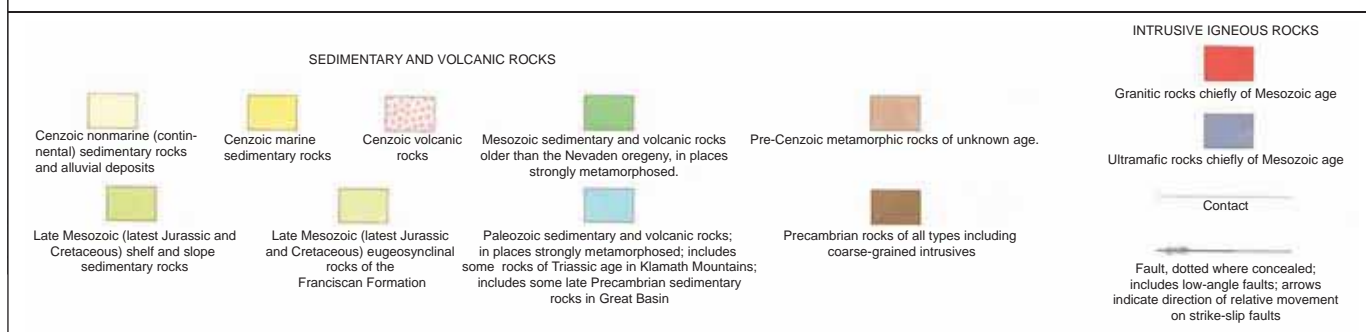
TABLE 3.1-4
DETERMINISTIC SEISMIC CHARACTERISTICS – BARSTOW SITE

Fault Name	Approximate Distance From Site (miles)	Maximum Considered Earthquake Moment Magnitude (Mw)	Peak Horizontal Ground Acceleration (g)
Lenwood	1.0	7.5	0.29
Camp Rock	10	6.8	0.29
Calico	13	7.3	0.29
Helendale	15	7.3	0.29

Source: USGS and CGS, 2006



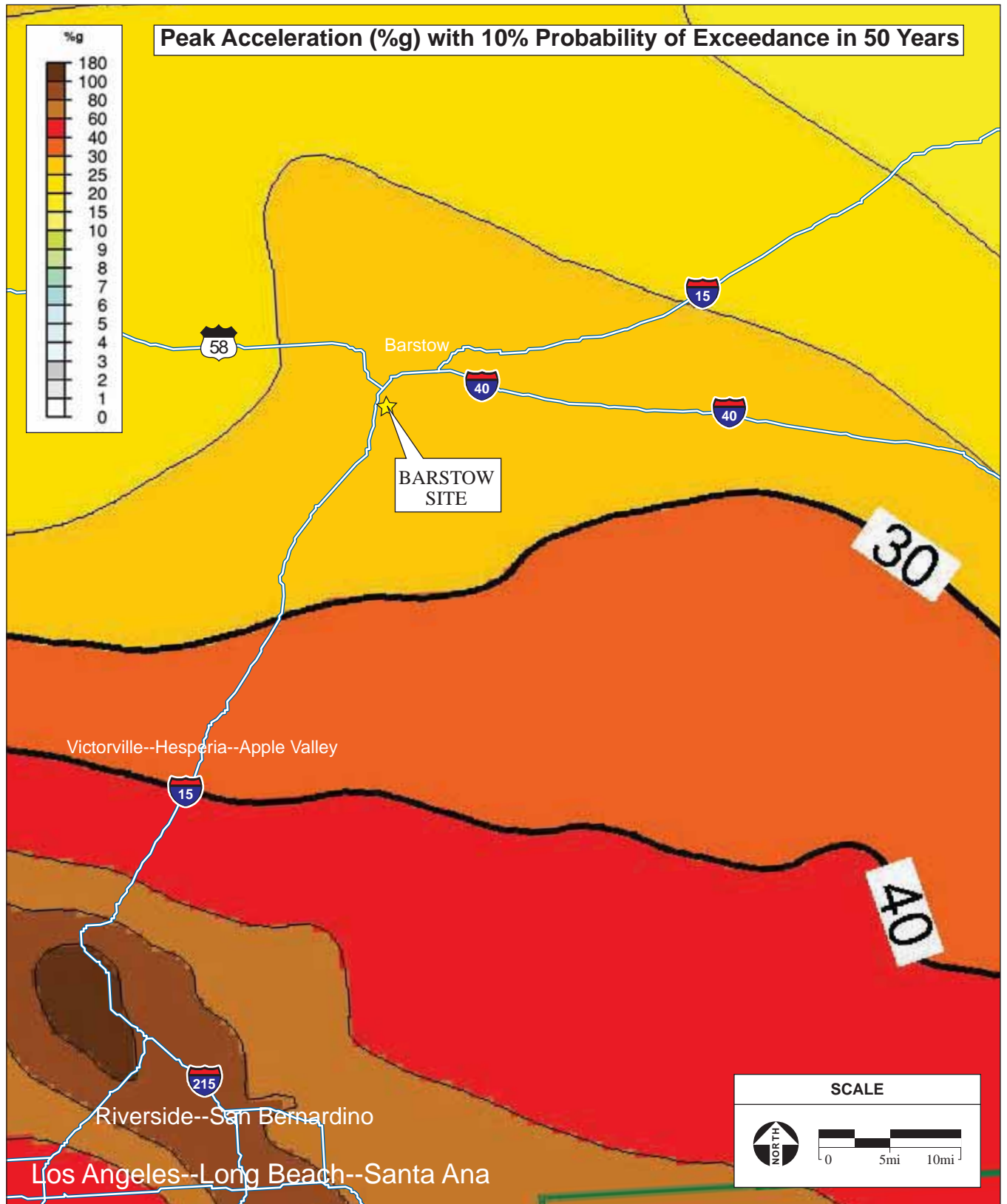
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SOURCE: USGS and California Division of Mines and Geology, 1966; AES, 2009

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Figure 3.1-4
Barstow Site Geology



SOURCE: USGS National Seismic Mapping Project, 1996;
ESRI Data, 2004; AES, 2009

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Figure 3.1-5
Barstow Site Earthquake Susceptibility

Liquefaction

On average, groundwater in the vicinity of the Barstow site is at a level of 230.7 feet below ground surface; therefore, there is no substantial risk of liquefaction in the project area (DWR, 2008).

Lateral Spreading

Because there is no substantial risk of liquefaction in the project area, it is also unlikely that lateral spreading will occur.

Mineral Resources

Common rock types and their associated mineral assemblages common to San Bernardino are as follows:

- Regional Late Mesozoic eugeosynclinal rocks of the Franciscan Formation
- Late Mesozoic shelf and slope sedimentary rocks
- Cenozoic marine sedimentary rocks
- Cenozoic nonmarine sedimentary rocks and alluvial deposits
- Cenozoic volcanic rocks, granitic rocks chiefly of Mesozoic age
- Ultramafic rocks chiefly of Mesozoic age

The rock types described above support regional operations of limited mining facilities for the production of granitic and sandstone gravel (USGS, 1960).

The City of Barstow General Plan (1997 Update) generally indicates the nearby Mojave River Corridor as a significant mineral resource, based on the mineral land classification maps of the California Division of Mines and Geology. This corridor is both an existing and a potential source of concrete aggregate deposits. No mining activity takes place on the Barstow site.

3.1.3 LOS COYOTES SITE

Geological Setting

The Los Coyotes site lies within North San Diego County, which is situated in the Peninsular Ranges Geomorphic Province (**Figure 3.1-1**). The Peninsular Ranges geomorphic province extends south from the Transverse Ranges, passing through the Los Angeles Basin and continuing 775 miles south of the U.S.-Mexico border. The Peninsular Ranges are bounded on the west by the Transverse Ranges and on the east by the Colorado Desert and include Orange County, the San Jacinto Mountains, and the Coachella Valley in the central portion of Riverside County. The ranges are comprised of a series of northwest-southeast trending mountains that are separated by several active faults, including the San Jacinto and Elsinore Fault zones.

Topography

The Los Coyotes site ranges in elevation from approximately 4,500 feet amsl on its southwestern corner, to approximately 4,585 feet amsl on its northeastern corner. **Figure 3.1-6** shows the topography of the Los Coyotes site. The Los Coyotes site is sloped between 3 and 6 percent from the northeastern corner to the southwestern corner, and is adjacent to hills exceeding 500 feet amsl in places. The San Ysidro Creek flows through the site along the western boundary. The surrounding topography is extremely mountainous, with slopes exceeding 17% on more than 75% of the reservation.

Soils and Geology

The Los Coyotes site consists of Mottsville series loamy coarse sand (MvC and MvD) and loamy alluvial sand (Lu) (**Figure 3.1-7**). Mottsville series soils are defined as consisting of excessively drained, very deep, loamy coarse sands that in places were formed in sandy sediments either transported from or weathered in place from granitic rock. Loamy alluvial sands on site are generally associated with fluvial deposition, such as seasonal swelling of the San Ysidro Creek (USDA, 1979). Soils on the site are not prone to expansion or corrosivity.

The granitic origin of these soils correlates with the surrounding geological formation process, which began in the Jurassic and Late Cretaceous eras, wherein a series of volcanic islands off the coastline of today's San Diego region were associated with the formation of a granitic and gabbroic batholith beneath the region. Los Coyotes site soil capability subclasses and limitations are outlined in **Table 3.1-5**.

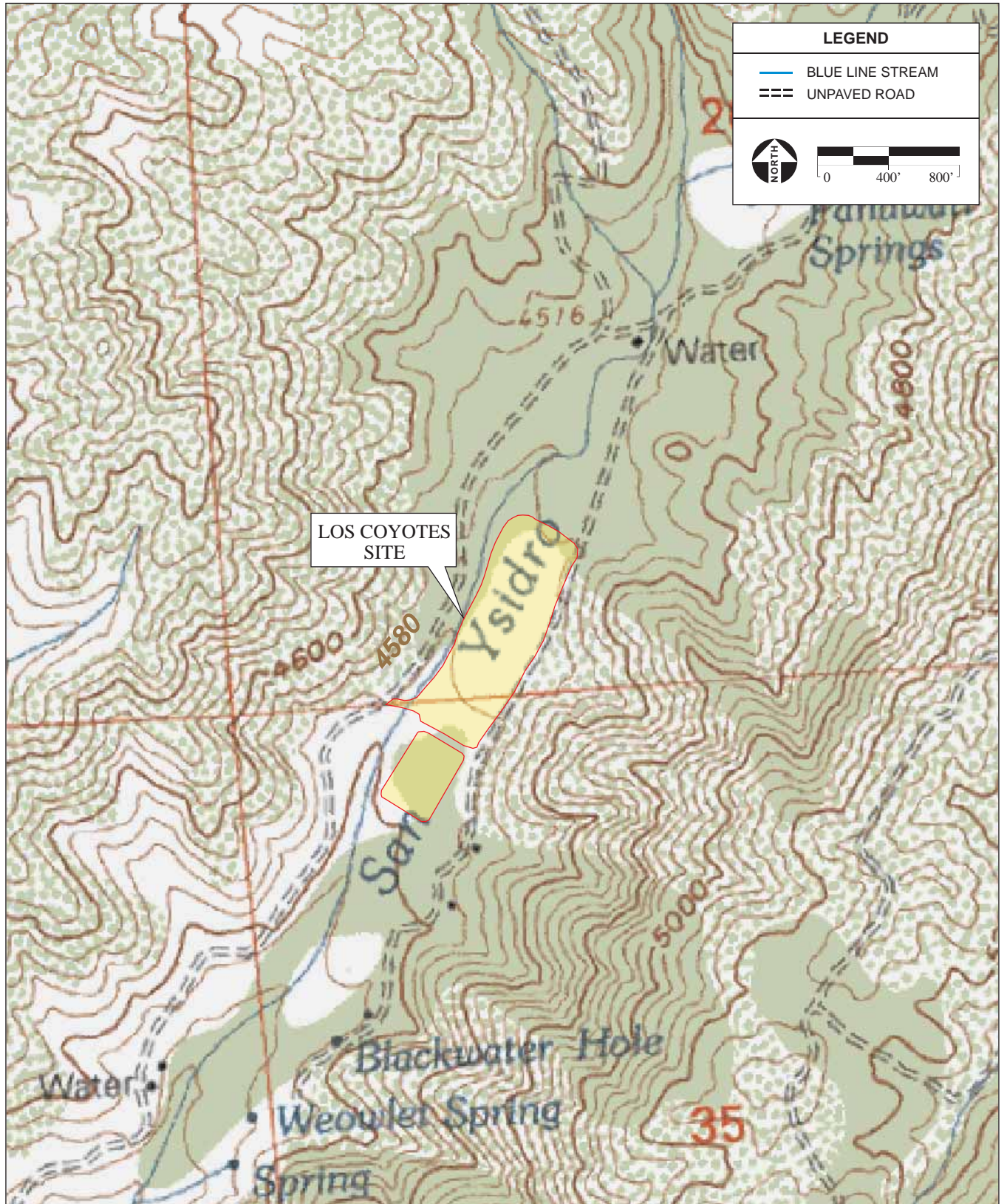
TABLE 3.1-5
PROJECT SOIL LIMITATIONS – LOS COYOTES SITE

Soils	Depth	Permeability	Drainage	Erosion	Shrink/Swell	Runoff	Capability Sub-class
Mottsville Loamy Coarse Sand (MvC) 2-9% slope	60 Inches	Very Rapid	Excessively Drained	Slight to Moderate	Low	Slow to Medium	IVsc-4
Mottsville Loamy Coarse Sand (MvD) 9-15% slope	60 Inches	Very Rapid	Excessively Drained	Moderate	Low	Medium	IVsc-4
Loamy Alluvial Sand (Lu) 0-5% slope	60 Inches	Moderate	Poorly Drained	Slight	Low	Slow	IIw-2

Source: USDA, 1979.

Seismicity

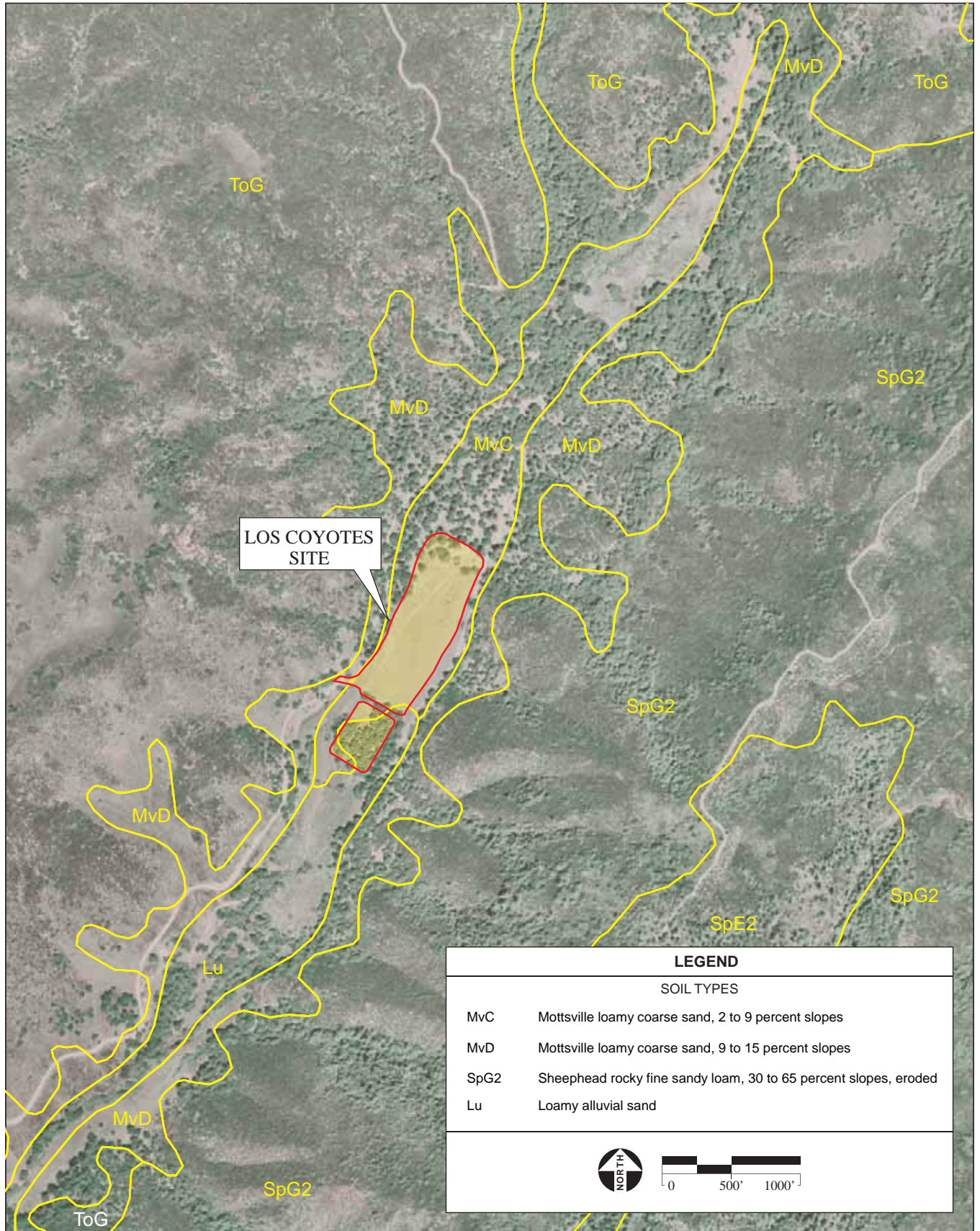
The Los Coyotes site is located in a seismically active region. The Elsinore Fault and the Coyote Creek Fault are parallel to one another and run diagonally from northwest to southeast across San Diego County. The only mapped fault that crosses the Los Coyotes Reservation is the Hot Springs fault (USGS and CGS, 2006). **Figure 3.1-8** shows the geology and faulting in the region of the Los Coyotes site.



SOURCE: "Hot Springs Mt., CA" USGS 7.5 Minute Topographic Quadrangle, Section 26, T10S R4E, San Bernadino Baseline & Meridian; AES, 2009

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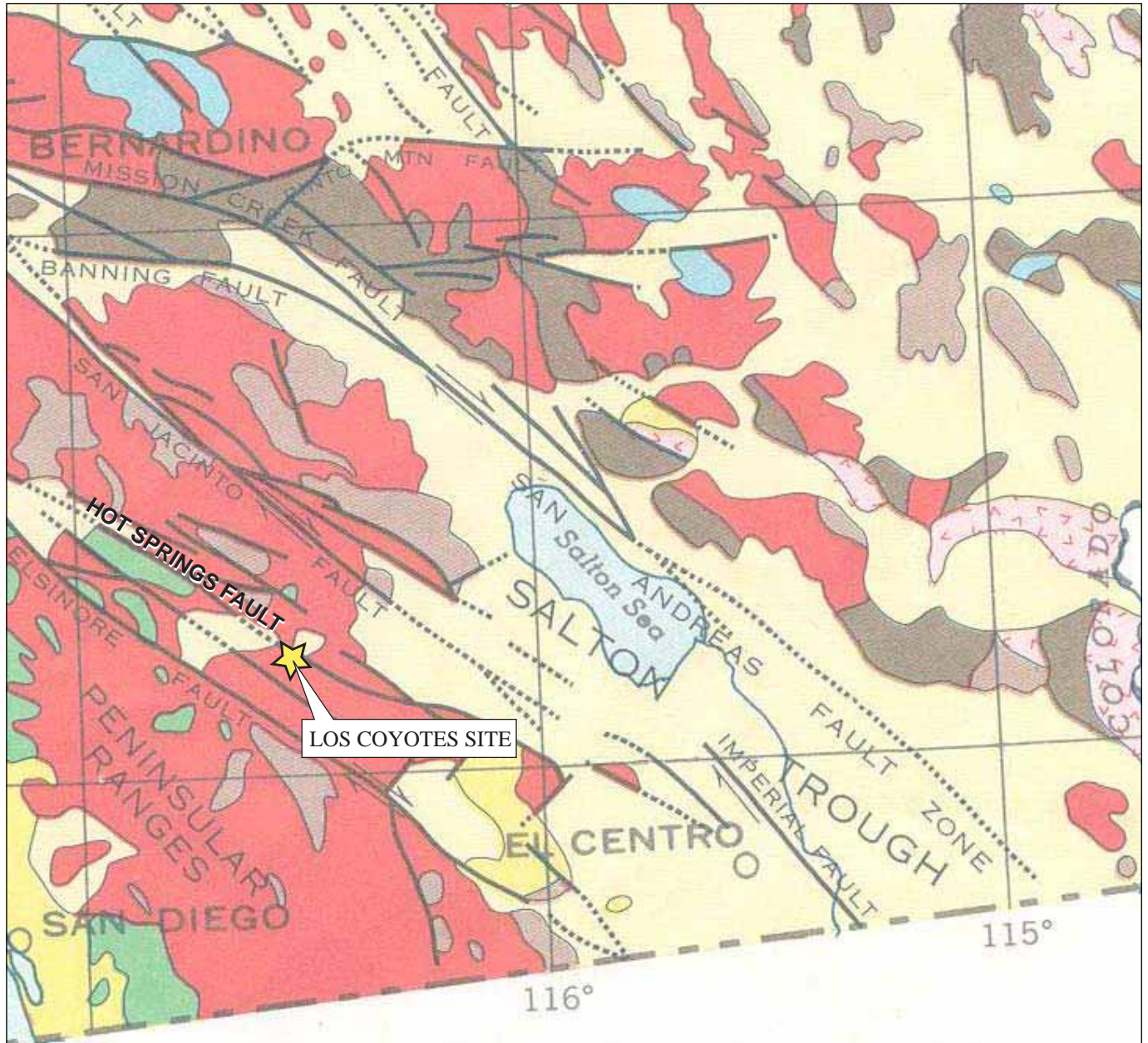
Figure 3.1-6
Los Coyotes Site Topography



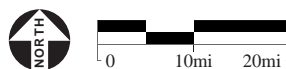
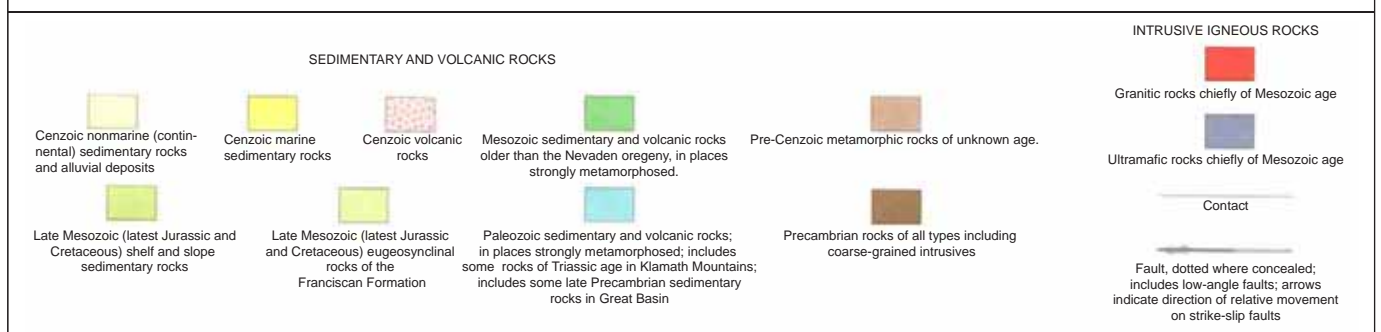
SOURCE: USGS Aerial Photo dated 4/1/04; USDA Soil Survey of San Diego County; AES, 2009

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Figure 3.1-7
Los Coyotes Site Soils



LEGEND



SOURCE: USGS and California Division of Mines and Geology, 1966; AES, 2009

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Figure 3.1-8
Los Coyotes Site Geology

The site is located within a region having a potential peak acceleration of 0.6g, with a 10 percent chance of exceedance in 50 years, as shown in **Figure 3.1-9**. **Table 3.1-2**, above, indexes the type of damage to be anticipated in such an event. At this level of acceleration, some well-built wooden structures would be destroyed; most masonry and frame structures would be destroyed along with their foundations; and the ground would be badly cracked. Other damage includes the bending of railways and considerable landslides from riverbanks and steep slopes. Sand and mud would be shifted and water splashed over its banks. Peak ground accelerations associated with faults in the vicinity of the Los Coyotes site are summarized in **Table 3.1-6**.

Liquefaction

The potential for liquefaction in San Diego County is limited to the lower San Dieguito River Valley or the portion of Borrego Valley near Borrego Sink (San Diego County, 1979). Neither of these locations is in the vicinity of the Los Coyotes site. Furthermore, the soils on the site are coarse to loamy, not fine or silty. Liquefaction on this site is unlikely.

TABLE 3.1-6
DETERMINISTIC SEISMIC CHARACTERISTICS – LOS COYOTES SITE

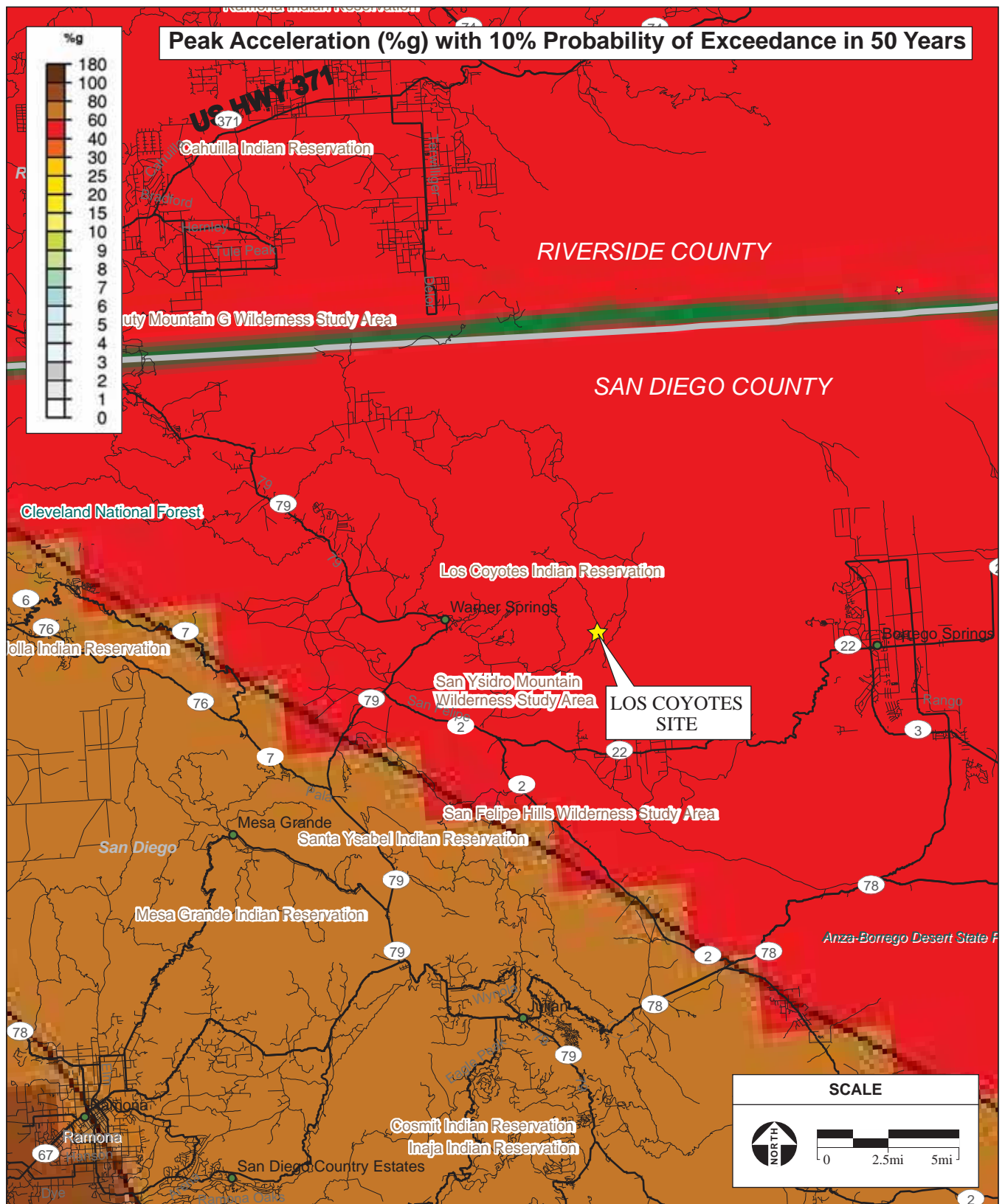
Fault Name	Approximate Distance From Site (miles)	Maximum Considered Earthquake Moment Magnitude (Mw)	Peak Horizontal Ground Acceleration (g)
Hot Springs	0.25	6.1	0.60
Coyote Creek	12.0	7.3	0.78
Elsinore	12.5	7.3	0.76
Source: USGS and CGS, 2006			

Lateral Spreading

Lateral spreading is commonly associated with liquefaction and is not likely to occur on the Los Coyotes site.

Mineral Resources

Rock types in San Diego County consist of Cretaceous Age granitic rocks, including diorites, gabbros and quartz diorites; Mesozoic Age metamorphic rocks such as schist, gneiss, and marble; Tertiary Age flat-lying, consolidated sedimentary rocks, consisting of sandstone, conglomerate, and mudstone; and recent alluvium, including sand, gravel, silt, and clay (San Diego County, 1979).



SOURCE: USGS National Seismic Mapping Project, 1996; ESRI Data, 2004; AES, 2009

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Figure 3.1-9
Los Coyotes Site Earthquake Susceptibility

3.2 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 Barstow and Los Coyotes sites. Water resources designated as Waters of the U.S. are discussed in **Section 3.4**. **Section 3.8** 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 **Chapter 4.0**.

3.2.1 BARSTOW SITE

Surface Water

The Barstow site is located in the Lahontan Basin, which for planning purposes is separated into north and south regions. The site lies within the South Lahontan Basin, which includes three major surface water systems: the Mono Lake, Owens River, and Mojave River watersheds. Locally, the project area is within the Middle Mojave hydrological unit of the Mojave River watershed, as shown in **Figure 3.2-1**. The watershed covers approximately 4,500 square miles and is bounded by the San Bernardino and San Gabriel Mountains to the south, Afton Canyon to the northeast, the Lucerne Valley to the east, and Antelope Valley to the west. The Mojave River Channel, the primary hydrologic feature in the watershed is approximately 120 miles long. The headwaters of the Mojave River are located in the San Bernardino Mountains and the river terminates at Silver Dry Lake near the community of Baker.

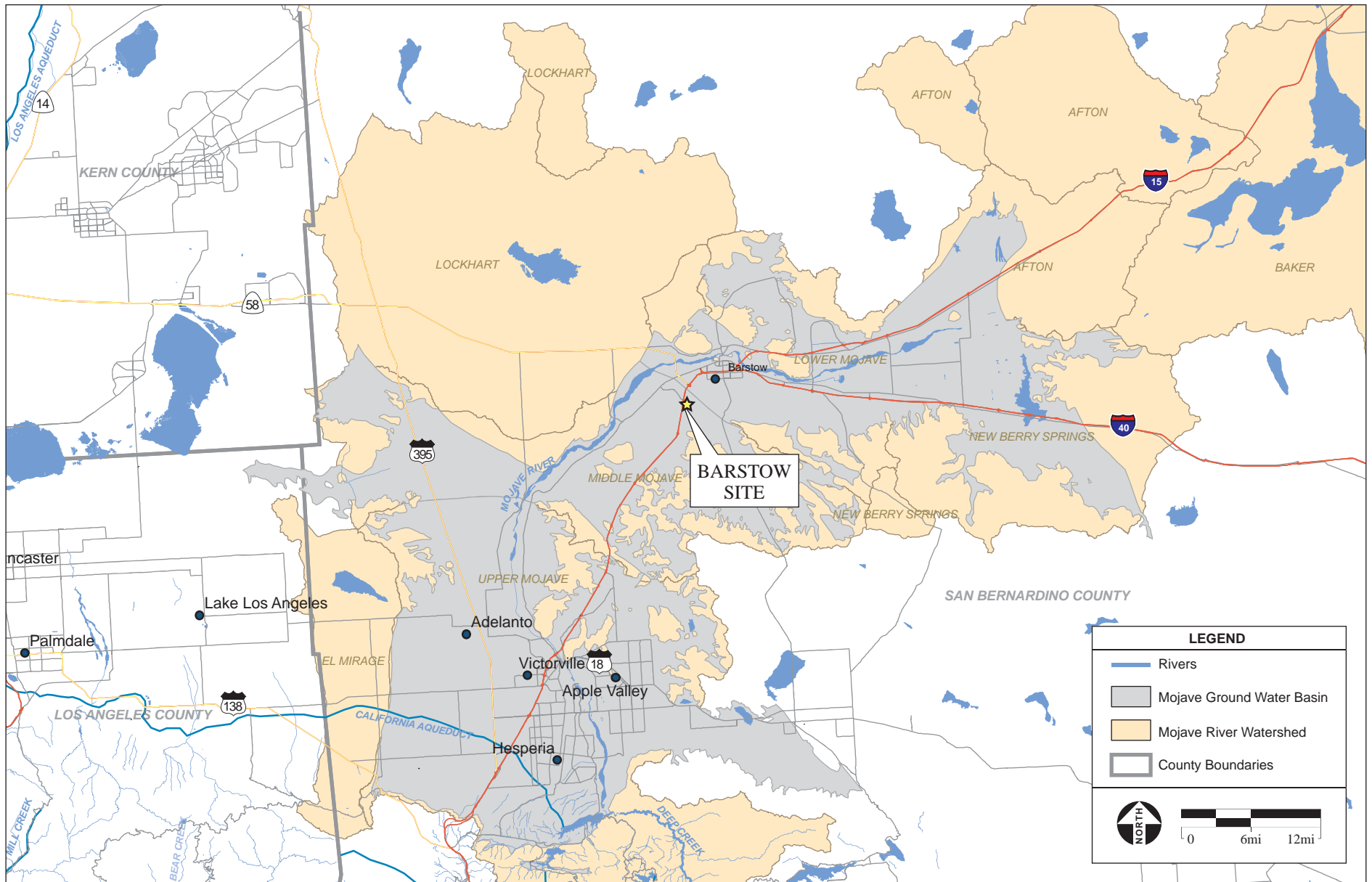
Precipitation rates in Barstow average approximately 4.4 inches per year (WRCC, 2008). In the Mojave Desert Region most of the rainfall occurs between November and April. A summer thunderstorm season occurs from July to September when violent and heavy rainstorms are possible. The project site is located approximately 4 miles from the Mojave River (**Figure 3.2-1**). There are no significant surface water features on the Barstow project site or adjacent parcels.

Drainage

Stormwater runoff from the project site is generally characterized as sheet flow with a convergence towards the northwest corner of the site. Stormwater generated on the Barstow site discharges to Lenwood Wash, an off-site concrete drainage ditch along Lenwood Road. The concrete ditch traverses along the eastern shoulder of Lenwood Road to the south for approximately 200 feet until passing over a rock-protected section and converting to an earthen ditch. The earthen portion of the drainage ditch traverses along the road for approximately 150 feet until coming to a low section where it flows under the road to the west through a culvert (Questa, 2007).

Floodplain

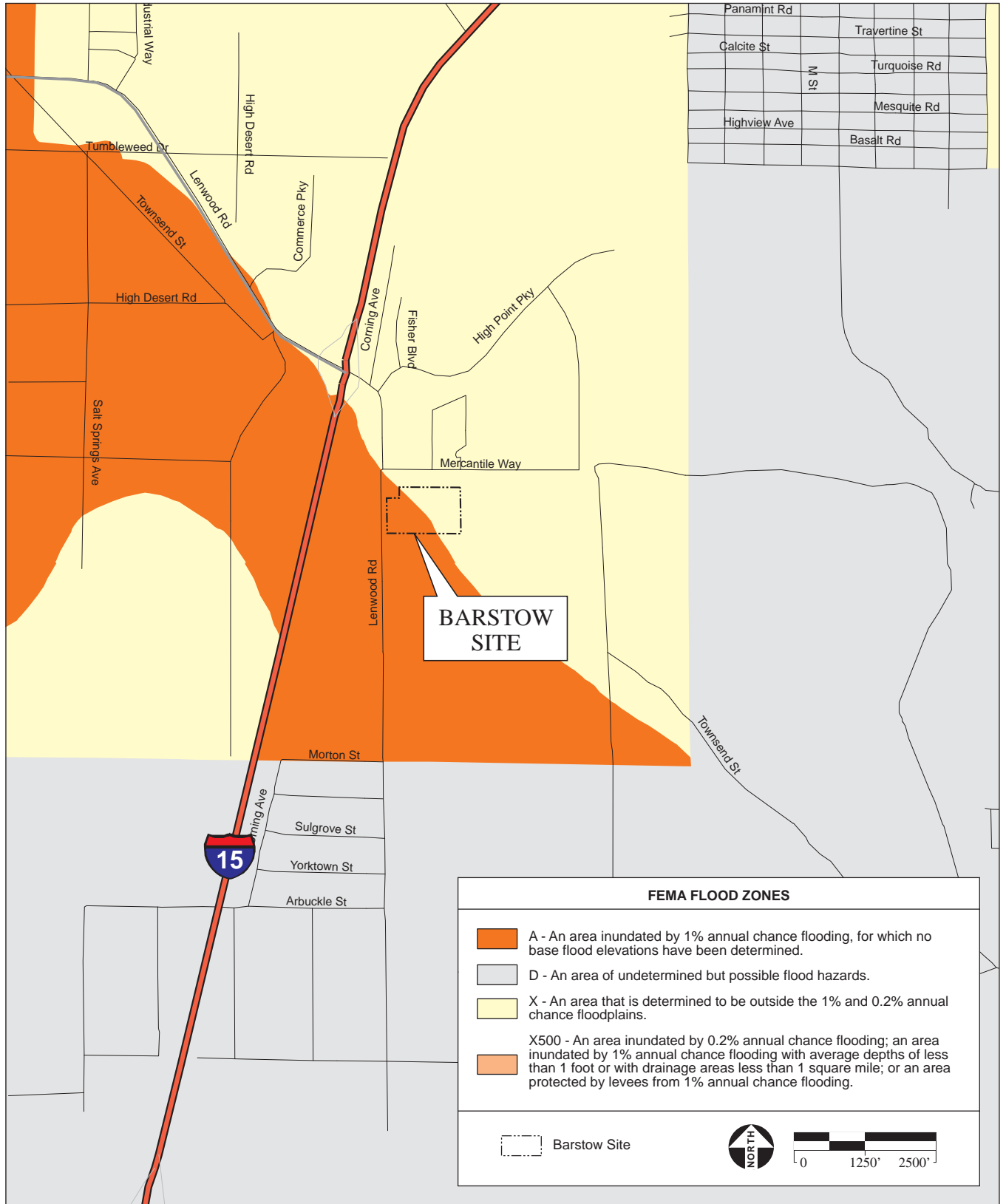
The southwest portion of the Barstow site lies within the Mojave River 100-year flood plain (**Figure 3.2-2**). This portion represents approximately 10.5 acres of the site that is designated Zone A0 (Depth 2). This area is defined as an area that could be inundated by a 100-year flood event with depths from 1 to 3 feet of sheet flow, for which no base flood elevations have been determined. The remaining portion of



SOURCE: ESRI Data, 2005; AES, 2009

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Figure 3.2-1
Barstow Site Water Resources



SOURCE: FEMA Q3 Flood Data, 1996; AES, 2009

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Figure 3.2-2
Barstow Site Flood Zone Map

the site is designated Zone X, which represents areas determined to be outside of the 500-year floodplain (FEMA, 2008).

Surface Water Quality

The Clean Water Act (CWA) is the major federal legislation governing water quality and applies to both point and non-point sources of pollution. Point sources pollution can be traced back to a single fixed discharge point such as a pipe, while non-point source pollution is generated without a fixed discharge point, such as chemicals entrained within stormwater runoff. The goals of the CWA include eliminating harmful discharges of pollution and providing water quality standards, criteria, and guidelines. Section 303(d) of the CWA requires states to identify impaired water bodies and develop total maximum daily loads (TMDLs) for the contaminant(s) of concern. The State Water Resources Control Board (SWRCB) implements the CWA in California under the delegation and oversight of the United States Environmental Protection Agency (USEPA). However, USEPA retains jurisdiction over discharges to waters on tribal trust land.

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 groundwaters, and specify water quality objectives designed to protect those uses. These water quality objectives are presented in the Regional Water Quality Control Plans (Basin Plans).

The Barstow site is currently under the jurisdiction of the Lahontan Regional Water Quality Control Board (LRWQCB). In accordance with Section 303(d) of the CWA, the LRWQCB submitted identified impaired water bodies in the basin to the SRWCB for the 2006 update of the 303(d) list. No water bodies associated with the Barstow site were identified as impaired on the list. In accordance with the CWA and the Porter-Cologne Water Quality Control Act, the LRWQCB has designated beneficial uses of the Mojave River in the LRWQCB Basin Plan. The beneficial uses are identified as: groundwater recharge, municipal and domestic supply, agricultural supply, cold freshwater habitat, commercial and sport fishing, contact and non-contact water recreation, warm freshwater habitat, and wildlife habitat. In addition, the LRWQCB Basin Plan identifies water quality objectives to sustain the long-term prevalence of beneficial uses of Mojave River water, as shown in **Table 3.2-1**.

TABLE 3.2-1
SURFACE WATER QUALITY OBJECTIVES FOR THE MOJAVE RIVER BASIN1

Parameter	Objective (mg/L)
Total Dissolved Solids (TDS)	445
Nitrate (NO ₃)	6
Notes: ¹ Mojave River (at Barstow). Source: LRWQCB, 2005.	

Water quality concerns associated with stormwater in desert communities are not as well defined as in non-desert communities. The typical surface water concerns associated with stormwater are not as

directly related to the state of the watershed because the Mojave River system is dominated by groundwater rather than surface water. However, constituents such as oil and grease, asbestos, pesticides, and herbicides continue to present concerns in desert communities as in other areas. Stormwater currently generated on the undeveloped project site is not expected to contain high levels of these contaminants.

Groundwater

The site lies within the 330 square mile Middle Mojave River Valley Groundwater Basin (Middle Basin), which is part of the larger, 1400-square-mile Mojave River Valley Groundwater Basin (**Figure 3.2-1**). The Middle Basin is bounded on the north by a combination of surface and subsurface divides, the Helendale fault, and the contact between Quaternary alluvium and consolidated basement rocks of the Kramer Hills and Iron Mountain.

Water in the Mojave River Groundwater Basin is supplied by two interconnected aquifers: a Floodplain Aquifer and the Regional Aquifer (**Figure 3.2-3**). The Floodplain Aquifer consists of sand and gravel deposits, with an average depth of 200 feet. A monitoring well located on adjacent property north of the project site identified an average groundwater elevation of 230.7 feet below ground surface (2005-2008) (DWR, 2008). This aquifer is restricted to an area within approximately 1 mile of the active Mojave River channel.

Wells in this aquifer yield from 100 to 4,000 gallons per minute (gpm), and the average well yield is approximately 480 gpm. The Regional Aquifer surrounds the Floodplain Aquifer and consists of silt, sand, and clay deposits that average approximately 300 feet deep. Well yields from the Regional Aquifer are generally less than from the Floodplain Aquifer (DWR, 2003).

Groundwater levels for wells in the Floodplain Aquifer near the Mojave River tend to vary with rainfall and runoff amounts, whereas groundwater levels in the Regional Aquifer do not show significant changes due to local rainfall. The general trend in the basin is for declining groundwater levels, particularly in the Regional Aquifer. However, increased precipitation in the 1990s resulted in increased infiltration of runoff and consequential increase in the Floodplain Aquifer groundwater level (DWR, 2003).

In the Mojave Basin natural recharge typically occurs from direct precipitation, ephemeral streamflow, infrequent surface flow of the Mojave River, and underflow of the Mojave River into the basin from the southwest. Additionally, when the Mojave River is flowing a large sporadic recharge occurs. The remainder of the total recharge comes from treated wastewater effluent, septic tank effluent, the California State Water Project (SWP), and irrigation waters that percolate into the ground (DWR, 2003).

Groundwater Supply

Residents overlying the Mojave Basin rely almost entirely on groundwater for their water supply. Reliance on groundwater has resulted in overdraft conditions since the early 1950s. Overdraft occurs when groundwater discharge (natural discharge plus pumpage) exceeds recharge, resulting in a net

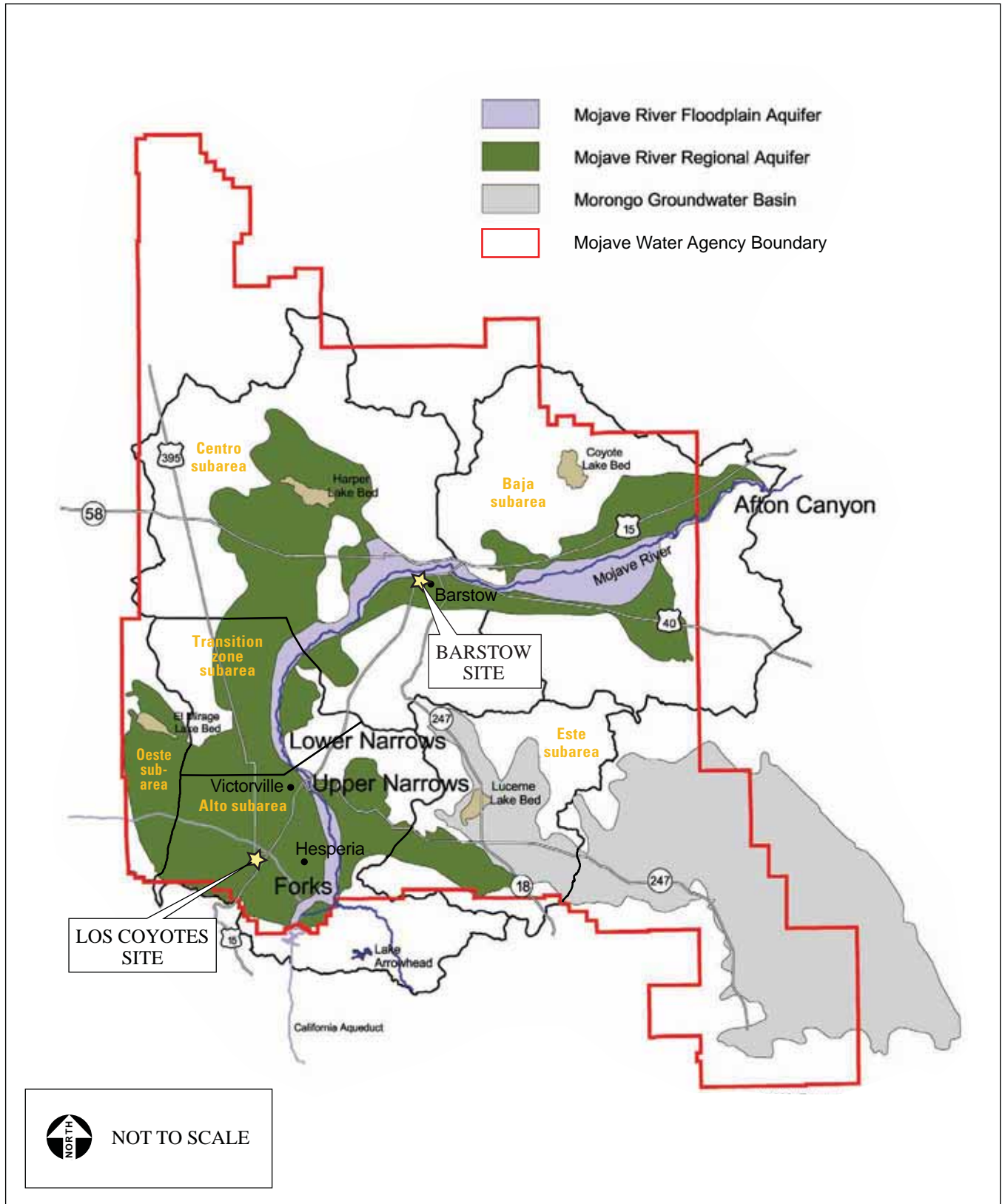


Figure 3.2-3
Mojave River Groundwater Aquifers

reduction in groundwater stored in the aquifers. The average annual net water supply for the Mojave Basin Area is estimated to be 63,400 acre feet per annum (afa) for the period 1931-2001. In the year 2000, 34,900 acre feet (af) was used for agricultural purposes and 70,300 af was used for municipal uses for a total of 105,200 af of consumptive use in the Mojave Basin Area. This resulted in a deficit of 41,800 af for the year 2000. Over the past 50 years, records from three wells indicate that overdraft has resulted in declined groundwater levels of the Regional Aquifer from 50 to 100 feet, and reduced regional storage by nearly two million af (ESA, 2004).

In 1959 the Mojave Water Agency (MWA) was formed by an act of the legislature and given broad powers to do “any and every act necessary... so that water may be available for any present or future... uses of the lands or inhabitants of the agency” (MWA, 2009). To mitigate the effects of overdraft in the Mojave River Groundwater Basin, the MWA is using imported SWP water for artificial recharge by surface spreading. The MWA contract with the SWP allows an annual entitlement of 50,800 af (1 af = 325,872 gallons). Later, MWA purchased an additional 25,000 af of entitlement from Berrenda Mesa Water District to bring its total annual entitlement to 75,800 af (MWA, 2004).

For management purposes, the MWA split the Mojave River watershed and associated groundwater basins into five separate “subareas.” The boundaries of the five subareas (Oeste, Este, Alto, Centro, and Baja) were determined based on hydrologic divisions in previous studies, evolving over time based on a combination of hydrologic, geologic, engineering, and political considerations. The project site is located in the Centro Subarea (**Figure 3.2-3**). Limits have been set on the amount of groundwater production that can occur in each subarea without incurring an obligation to buy imported water. Subareas upstream have an annual obligation to subareas downstream based on long-term averages between 1930 and 1990. The Centro subarea is the only subarea in the Mojave River watershed that has experienced surplus in the water budget. In 2000, the Centro subarea exhibited a surplus in the water balance of 1,200 acre-feet (ESA, 2004).

Groundwater Quality

Table 3.2-2 presents groundwater quality objectives for the Mojave River at Barstow from the LRWQCB Basin Plan. Historic discharges of industrial, commercial, and domestic wastewater have degraded groundwater quality in the Barstow area.

Degradation of groundwater quality has been caused by several constituents of concern, including petroleum hydrocarbons, phenols, methylene blue active substances (surfactants), and total dissolved solids (TDS). Several domestic wells were impacted, and their use was discontinued. Salts and nitrates have leached into the local groundwater from the Lenwood landfill in the lower portion of the Middle Mojave River Groundwater Basin. Irrigation with effluent from the Barstow wastewater reclamation facility, along with naturally occurring nitrates and salts, may also be affecting the basin (DWR, 2004b).

Since approximately 1990, the LRWQCB and the City of Barstow have worked together to identify and eliminate sources of elevated TDS that enter the City’s wastewater treatment plant. Through an aggressive source control program, the City has reduced the concentration of TDS in its effluent from greater than 1000 mg/L to typically less than 800 mg/L (LRWQCB, 2005).

TABLE 3.2-2
GROUNDWATER QUALITY OBJECTIVES FOR THE MOJAVE RIVER BASIN

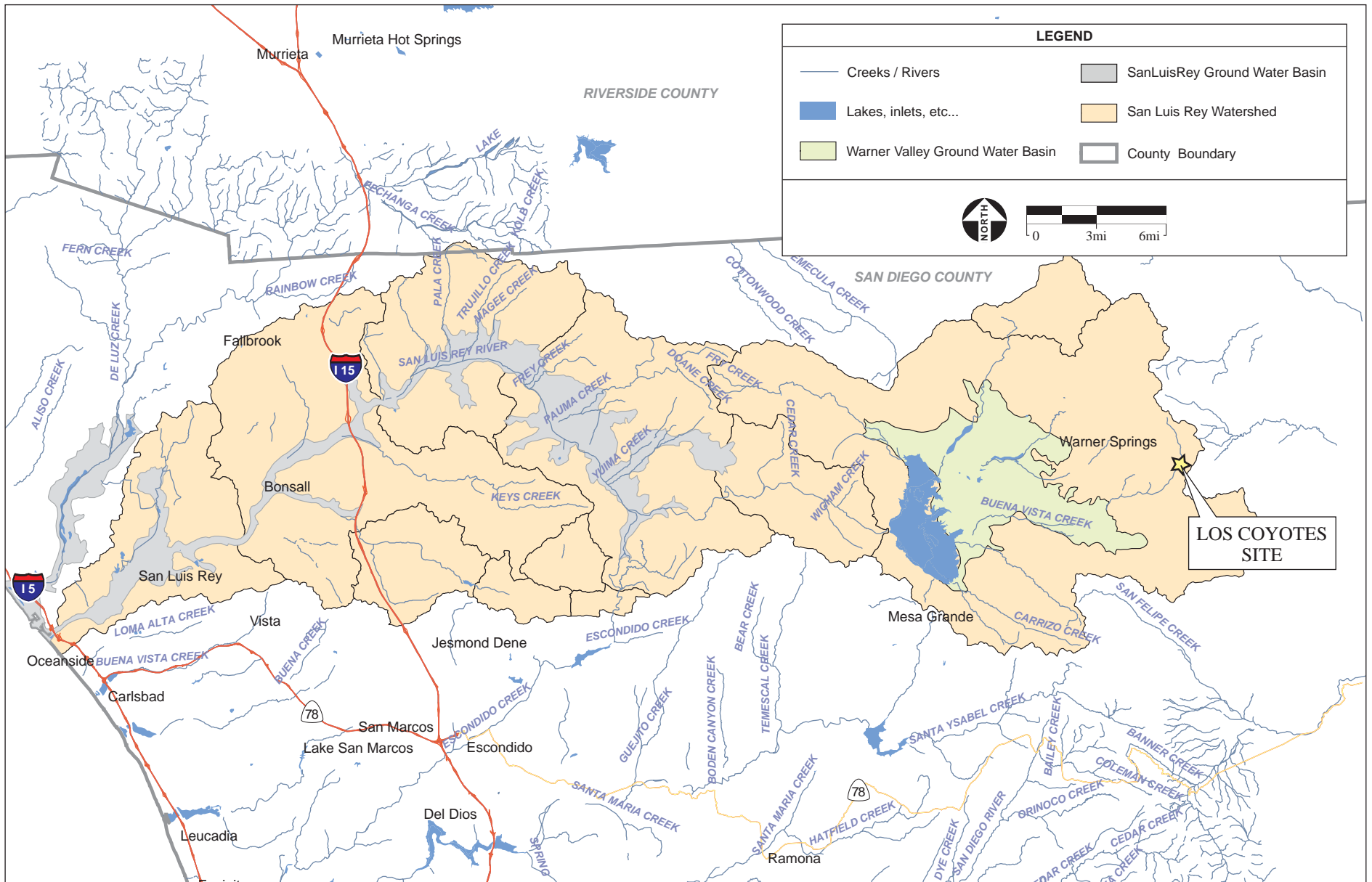
Constituent	Water Quality Objective
Total Dissolved Solids (TDS)	445 (mg/L, maximum)
Nitrate (NO ₃)	6 (mg/L, maximum)
Bacteria, Coliform	In groundwaters designated as municipal (MUN), the median concentration of coliform organisms over any seven-day period shall be less than 1.1/100 milliliters.
Chemical Constituents	MUN groundwaters shall not contain concentrations of chemical constituents in excess of the maximum contaminant level (MCL) or secondary maximum contaminant level (SMCL) based upon drinking water standards specified in the following provisions of Title 22 of the California Code of Regulations. Waters designated as agriculture (AGR) shall not contain concentrations of chemical constituents in amounts that adversely affect the water for beneficial uses (i.e., agricultural purposes). Groundwaters shall not contain concentrations of chemical constituents that adversely affect the water for beneficial uses.
Radioactivity	MUN groundwaters shall not contain concentrations of radionuclides in excess of the limits specified in Title 22 of the California Code of Regulations.
Tastes and Odors	Groundwaters shall not contain taste or odor-producing substances in concentrations that cause nuisance or that adversely affect beneficial uses. For MUN groundwaters, at a minimum, concentrations shall not exceed adopted secondary maximum contaminant levels of Title 22 of the California Code of Regulations.
Source: LRWQCB, 2005.	

3.2.2 LOS COYOTES SITE

Two-thirds of the Los Coyotes Reservation watershed lies within the San Luis Rey watershed (**Figure 3.2-4**), including the project site. One-third of the Reservation lies within the Anza-Borrego watershed. The Reservation is located primarily within the San Diego groundwater Basin, with a small portion located in the Colorado River groundwater Basin.

The San Diego Region has thirteen principal stream systems originating in the western highlands that flow to the Pacific Ocean. Surface water impoundments capture flow from nearly all of the region's major streams. The San Luis Rey River originates at the crest of the coast range in northern San Diego County and flows approximately 16 miles to Lake Henshaw, downstream of the Los Coyotes Reservation. The lake flow eventually discharges to the Pacific Ocean at the City of Oceanside, California.

Most rainfall at the Reservation occurs from December to March. The average annual precipitation in the immediate vicinity of the Reservation is approximately 16 inches. A decrease to 10 inches annually occurs on the Reservation east of Hot Springs Mountain because of the rain shadow effect (precipitation decreasing on the leeward side of a mountain).



SOURCE: ESRI Data, 2005; AES, 2009

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Figure 3.2-4
Los Coyotes Site Water Resources

Drainage

The Reservation contains approximately 62 miles of streams, including San Ysidro Creek, Cougar Canyon Creek, Borrego Palm Canyon Creek, and their tributaries. The San Ysidro Creek and Middle Fork of Borrego Palm Canyon Creek are perennial. Flow in most streams within the Reservation is intermittent, consisting of rainfall runoff or groundwater discharge during spring flow. The Los Coyotes site is located adjacent to San Ysidro Creek, which drains to Buena Vista Creek and then to Lake Henshaw. Downstream of Lake Henshaw, the river flows through a narrow canyon along the base of Palomar Mountain until it is diverted to the Escondido Canal, which conveys water to Lake Wohlford for municipal and irrigation uses. The project site slopes southwest between three to six percent, creating a mild cross slope providing drainage from the site to San Ysidro Creek.

Floodplain

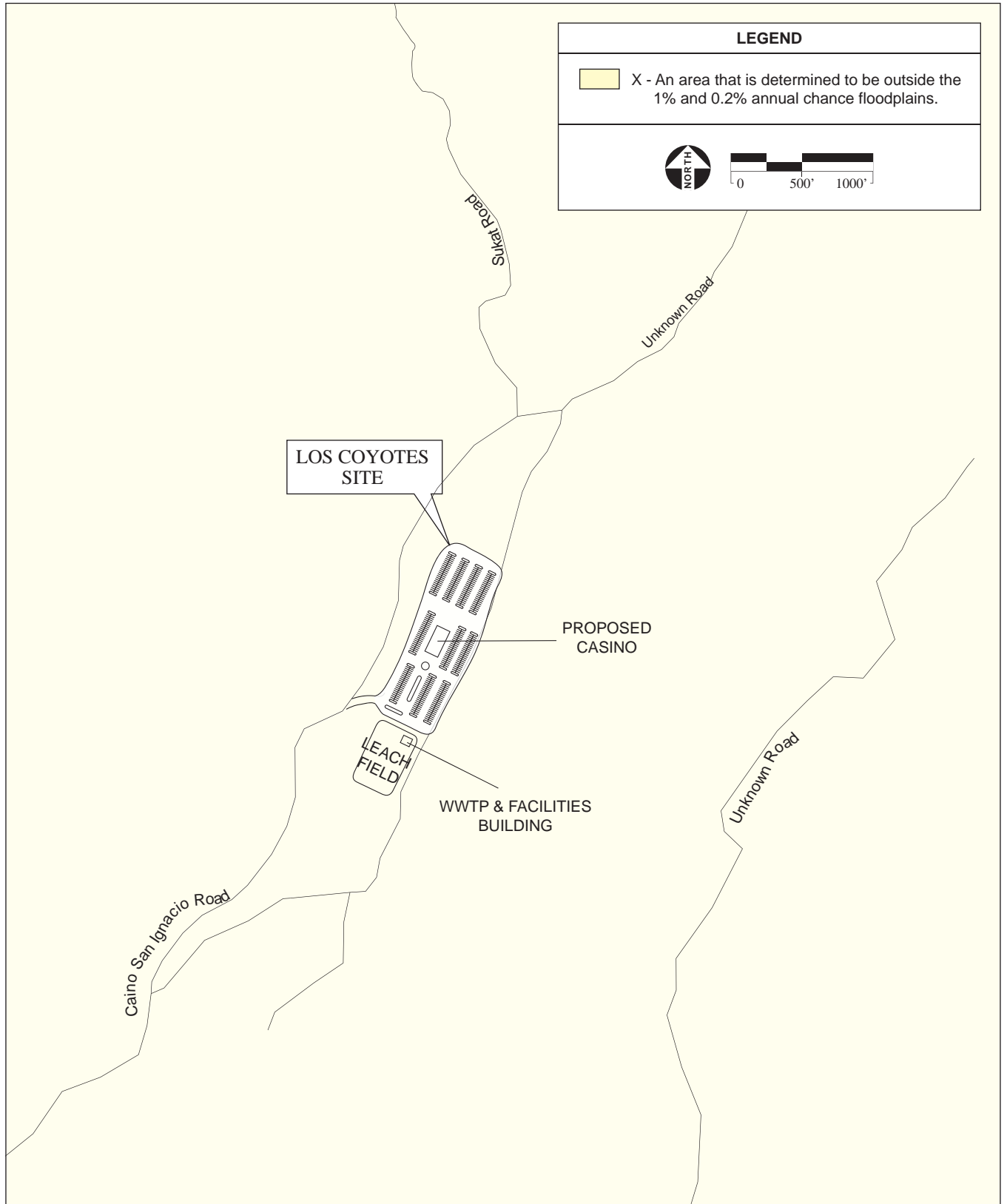
The Los Coyotes site is not located within a designated 100-year floodplain (FEMA, 2006). On the FEMA Flood Zone Map (**Figure 3.2-5**) the site is labeled Zone D, which represents areas for which flood hazards are undetermined.

Surface Water Quality

There are no water bodies within the vicinity of the project site that are listed on the 2006 state impaired water body 303(d) list. Existing or potential beneficial uses of the surface water of San Ysidro Creek within the San Luis Rey River Watershed are identified within the San Diego Regional Water Quality Control Board (SDRWQCB) Basin Plan as: municipal and domestic supply, agricultural supply, industrial service supply, freshwater replenishment, hydropower generation, contact and non-contact water recreation, warm freshwater habitat, and wildlife habitat. In addition, the SDRWQCB Basin Plan identifies surface water quality objectives to sustain the long-term prevalence of beneficial uses of San Diego regional water, as shown in **Table 3.2-3**. The USEPA implements CWA provisions on the Los Coyotes site, as the Bureau of Indian Affairs (BIA) holds the land in trust on behalf of the tribe.

TABLE 3.2-3
SURFACE WATER QUALITY OBJECTIVES FOR THE WARNER VALLEY

Parameter	Objective (mg/L)
Total Dissolved Solids (TDS)	500
Chloride (Cl)	250
Sulfate (SO ₄)	250
Percent Sodium (%Na)	60
Iron (Fe)	0.3
Manganese (Mn)	0.05
Methylene Blue - Activated Substances (MBAS)	0.5
Boron (B)	0.75
Turbidity NTU	20
Color Units	20
Fluoride (F)	1
Source: SDRWQCB, 2007	



SOURCE: ESRI Q3 Flood Data; USGS Aerial Photograph, 5/28/2002; AES, 2009

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Figure 3.2-5
Los Coyotes Site Floodplain Map

Groundwater

The Los Coyotes site is located uphill/upriver from the Warner Valley groundwater basin (Groundwater Basin Number 9-08) (as shown in **Figure 3.2-4**). The Basin covers an area of 37.5 square miles and extends from the base of San Ysidro Creek to Buena Vista Creek and the Eastern shore of Lake Henshaw. The annual average recharge is estimated at 1.14 inches, which is equivalent to an average annual recharge rate of 2,369 af. San Diego regional drainage basins tend to be relatively small in area and have shallow groundwater.

The groundwater aquifer of the Reservation consists of fractured bedrock, and alluvial materials that are generally restricted to the valleys of San Ysidro and San Ignacio Creeks. The steep topography and fractured rock aquifer of the Reservation are responsible for the occurrence of springs in the area (Springer and Anderson, 1998). The largest concentrations of springs are in the San Ysidro Creek and Borrego Palm Canyon Creek Valleys. Spring discharge is highly variable and has been documented to range from 1 to 20 gpm.

Groundwater trends have historically varied across the Warner Valley Groundwater Basin. Water levels in a well in the southeastern portion of the basin declined about 3 feet from 1912 through 1967; however, in the central portion of the basin, groundwater levels in wells declined 30 to 138 feet during the 1950s and 1960s (DWR, 2004b).

Groundwater Supply

The small alluvial valleys of San Ysidro Creek and Borrego Palm Canyon Creek are the only areas of the Reservation where significant quantities of water may be in storage. Nearly all of the local groundwater resources in the region have been intensively developed for municipal and agricultural supply purposes. Existing wells in the vicinity of the Reservation are associated with fractured igneous rock. Several private wells are used for domestic water supply, and a community well has been installed. Wells drilled into fractured igneous rock generally yield less than 5 gpm, while yields of 30 gpm may occur from wells drilled into several feet of saturated alluvium overlying fractured rock. The largest reported well yields in the vicinity of the Reservation are 100 to 500 gpm, and are drilled into alluvial material more than 50 feet thick (Springer and Anderson, 1998).

The Los Coyotes Reservation is supplied with water from several spring-fed sources and hand-dug wells that supply a community water system serving Tribal residents and the Los Coyotes tribal offices (Springer and Anderson, 1998). The community spring lies in the San Ysidro Valley and has provided a water source for the community system for several years. The springs are also used as private water sources (Marc Anderson, Inc., 2004). The most efficient well on the Reservation is a flowing artesian well at San Ignacio, which has been determined to have the potential for the largest well yields, with a safe yield of 62 gpm and a maximum yield capacity of 500 gpm (Marc Anderson, Inc., 2004; Ballog, 1980).

Groundwater Quality

Groundwater in the Warner Valley Groundwater Basin is generally rated suitable for irrigation and domestic uses except near Warner Hot Springs, where it is rated inferior for irrigation use because of

sodium content and for domestic use because of high fluoride concentrations. The groundwater is dominantly sodium bicarbonate in character, though some calcium bicarbonate water is found in the southern part of the basin. Some sulfate- and chloride-rich water is found near Warner Hot Springs in the eastern part of the basin.

Groundwater quality objectives for Warner Valley groundwater basin of the San Luis Rey Hydrological Unit have been determined by the SDRWQCB, as shown in **Table 3.2-4**.

TABLE 3.2-4
GROUNDWATER QUALITY OBJECTIVES FOR THE WARNER VALLEY

Parameter	Objective (mg/L)	Parameter	Objective (mg/L)
Total Dissolved Solids (TDS)	500	Manganese (Mn)	0.05
Chloride (Cl)	250	Methylene Blue-Activated Substances (Surfactants)	0.5
Sulfate (SO ₄)	250	Boron (B)	0.75
Percent Sodium (%Na)	60	Turbidity NTU	5
Nitrate (NO ₃)	5	Color Units	15
Iron (Fe)	0.3	Fluoride (F)	1
Source: SDRWQCB, 2007			

3.3 AIR QUALITY

This section describes the existing environmental conditions for the proposed Barstow and Los Coyotes sites. The general and site-specific profiles of air quality contained herein provide the environmental baseline by which direct, indirect, and cumulative environmental effects are identified and measured in **Chapter 4.0**.

3.3.1 REGULATORY CONTEXT

The Federal Clean Air Act (CAA) was enacted for the purposes of protecting and enhancing the quality of the nation's air resources to benefit public health, welfare, and productivity. The United States Environmental Protection Agency (USEPA) is the federal agency responsible for identifying air pollutants of concern, establishing air quality standards, and approving and overseeing state air programs which implement the CAA in order to achieve national and state air quality goals.

Criteria Air Pollutants (CAPs)

Criteria Air Pollutants (CAPs) are common pollutants that have been identified by USEPA as being detrimental to human health. CAPs are used as indicators of regional air quality. The USEPA has designated six CAPs: ozone (O₃), carbon monoxide (CO), particulate matter (PM), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), and lead (Pb).

The following CAPs are of special concern in the Mojave Desert Air Basin and San Diego Air Basin, where the Barstow site and Los Coyotes site are located, respectively.

Ozone

Photochemical reactions involving reactive organic gases (ROG) and oxides of nitrogen (NO_x) resulting from the incomplete combustion of fossil fuels are the largest source of ground-level O₃. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. As a photochemical pollutant, O₃ is formed only during daylight hours under appropriate conditions, but is destroyed throughout the day and night. O₃ is considered a regional pollutant, as the reactions forming it take place over time and are often most noticeable downwind from the sources of the emissions.

Particulate Matter

Particle pollution is a mixture of microscopic solids and liquid droplets suspended in air. This pollution, also known as particulate matter, is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, soil or dust particles, and allergens (such as fragments of pollen or mold spores). The size of particles is directly linked to their potential for causing health problems. Particles smaller than 10 micrometers (µm) in diameter (PM₁₀) but greater than 2.5 µm pose the greatest problems, because they can be inhaled deep into the lungs. Exposure to such particles can affect respiratory system function.

National Ambient Air Quality Standards (NAAQS)

The established maximum concentrations for the six CAPs are known as the National Ambient Air Quality Standards (NAAQS). Concentrations above these time-averaged limits are anticipated to cause adverse health effects to sensitive receptors. The CAA established primary and secondary NAAQS. Primary standards set limits to protect public health, while secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. For some of the CAPs, more than one averaging time standard has been identified in order to address the typical exposures found in the environment. The EPA has established violation criteria for each CAP. For example, in order to constitute a violation, the NAAQS for O₃ must be exceeded on more than three days in three consecutive years. On the other hand, if the CO NAAQS is exceeded on more than one day in any given year, a violation has occurred. Refer to **Table 3.3-1** for the violation criteria for the various averaging times for each CAP.

The USEPA identifies areas throughout the United States that meet the NAAQS, these areas are labeled either attainment or unclassifiable. Areas that do not meet the NAAQS are labeled either “nonattainment” or “maintenance.”

TABLE 3.3-1
NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Symbol	Average Time	Standard (ppm)	Standard (ug/m ³)	Violation Criteria
Ozone	O ₃	8 hours	0.075	N/A	If exceeded on more than 3 days in 3 years
Carbon monoxide	CO	8 hours	9	N/A	If exceeded on more than 1 day per year
		1 hour	35	N/A	If exceeded on more than 1 day per year
Nitrogen dioxide	NO _x	Annual average 1 hour	0.053 N/A	100 N/A	If exceeded N/A
Sulfur dioxide	SO _x	Annual average 24 hours	0.03 0.14	80 365	If exceeded If exceeded on more than 1 day per year
		1 hour	0.75		N/A
Inhalable particulate matter	PM ₁₀	Annual geometric mean	N/A	N/A	N/A
		Annual arithmetic mean	N/A	50	If exceeded
		Annual arithmetic mean 24 hours	N/A	150	If exceeded on more than 1 day per year
Fine particulate matter	PM _{2.5}	Annual arithmetic mean 24 hours	N/A N/A	15 35	If exceeded If exceeded on more than 1 day per year
Lead particles	Pb	Calendar quarter	N/A	1.5	If exceeded on more than 1 day per year
		30 days	N/A	60	N/A
Notes: All standards are based on measurements at 25°C and 1 atmosphere pressure. National standards shown are the primary (health effects) standards. N/A = not applicable; ppm = parts per million; ug/m ³ = micrograms per cubic meter. Source: EPA, 2010					

The USEPA further classifies nonattainment areas according to the level of pollution in each. There are five classes of nonattainment areas: maintenance (recently became compliant with the NAAQS), marginal (relatively easy to obtain levels below the NAAQS), serious, severe, and extreme (will be difficult to reach levels below NAAQS). The CAA uses the classification system to design clean-up requirements appropriate for the severity of the pollution and set realistic deadlines for reaching clean-up goals. Attainment and nonattainment areas are identified through monitoring. Unclassifiable areas are those for which air monitoring has not been conducted but are assumed to be in attainment for the NAAQS. States, municipal statistical areas, air basins, and counties that contain areas of non-attainment are required to develop a SIP, which outlines policies and procedures designed to bring the state into compliance with the NAAQS.

State Implementation Plans (SIPs)

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 rules, state regulations, and federal controls. All of the items that are included in the SIP are published in the Code of Federal Regulations.

Federal General Conformity

The General Conformity Rule of the federal CAA (42 USC 7401), implements Section 176(c) of the Act, and establishes minimum thresholds for volatile organic compounds (VOCs) and NO_x (ozone precursors), particulate matter (10 microns) (PM₁₀), and other regulated constituents for non-attainment and maintenance areas.

Title 40 Part 93 of the Code of Federal Regulations (CFR) was promulgated in order to determine conformity of Federal actions to the applicable SIP. A lead agency must make a determination that a federal action conforms to the applicable implementation plan before the action is taken. A conformity determination is required for each pollutant where a total of direct and indirect emissions in a nonattainment or maintenance area caused by the federal action are greater than *de minimus* thresholds as listed in CFR Section 93.153(b).

The thresholds established in the general conformity rule provide simple and direct guidance for federal agencies to ensure that they comply with an approved SIP. The general conformity rule includes a procedure for determining whether the rule is applicable to the actions of a federal agency. The procedure has two phases:

- 1) The Conformity Review process, which entails a review of each analyzed alternative to assess whether a full conformity determination is necessary, and
- 2) The Conformity Determination process, which demonstrates how an action would conform to the applicable SIP.

The first step compares emissions estimates for the project to the appropriate general conformity *de minimus* threshold based on nonattainment type. If the emission estimates from step one are below the thresholds, then a general conformity determination is not necessary and step two is not required.

Other Air Pollutants

Greenhouse Gases

Federal

Climate change is a global phenomenon attributable to the sum of all human activities and natural processes. In 1997, the Council on Environmental Quality (CEQ) circulated an internal draft memorandum (CEQ, 1997a) on how global climate change should be treated for the purposes of the National Environmental Policy Act (NEPA). The CEQ draft memorandum advised federal lead agencies to consider how proposed actions subject to NEPA would affect sources and sinks of green house gases (GHGs). During the same year, CEQ released guidance on the assessment of cumulative effects in NEPA documents (CEQ, 1997b). Consistent with the CEQ draft memorandum, climate change impacts were offered as one example of a cumulative effect.

The following are the most recent regulatory actions taken by the USEPA:

- On July 23, 2009, USEPA published a final “rule which proposes to establish the criteria for including sources or sites in a Registry of Recoverable Waste Energy Sources (Registry),” as required by the Energy Independence and Security Act of 2007. Waste energy can be used to produce clean electricity. The clean electricity produced by waste energy would reduce the need for non-renewable forms of electricity production, thus reducing greenhouse gas (GHG) emissions.
- On September 15, 2009, USEPA and the Department of Transportation’s National Highway Traffic Safety Administration (NHTSA) proposed a new national program that would reduce GHG emissions and improve fuel economy for all new cars and trucks sold in the United States. USEPA proposed the first national GHG emissions standards under the Clean Air Act, and NHTSA proposed an increase in the Corporate Average Fuel Economy (CAFE) standards under the Energy Policy and Conservation Act.
- In response to the FY2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110–161), USEPA issued the Final Mandatory Reporting of Greenhouse Gases Rule. Signed by the Administrator on September 22, 2009, the rule requires that suppliers of fossil fuels and industrial GHGs, manufacturers of vehicles and engines outside of the light duty sector, and facilities that emit 25,000 metric tons or more of GHGs per year to submit annual reports to USEPA. The rule is intended to collect accurate and timely emissions data to guide future policy decisions on climate change.
- On September 30, 2009, USEPA proposed new thresholds for greenhouse gas emissions (GHG) that define when Clean Air Act permits under the New Source Review and title V operating permits programs would be required.

- In February, 2010 The CEQ Chair released a memorandum, *Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions*. The memorandum provides guidance on how project-related GHG emission should be analyzed in NEPA documents. The Draft Guidance provides that a NEPA climate change analysis shall provide quantification and mitigation to reduce GHG emissions. The guidance also provides that 25,000 metric tons of GHG emissions per year may be a helpful guideline to assist lead agencies in making informed decisions on climate change impacts resulting from a project subject to NEPA. The guidance notes that the 25,000 metric tons is not a threshold for evaluating climate change on the project level.

State

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. A brief summary of these laws and policies is provided below.

Assembly Bill 1493 (AB 1493)

Signed by the Governor in 2002, AB 1493 requires that the CARB adopt regulations requiring a reduction in GHG emissions emitted by cars in the state. AB 1493 is intended to apply to 2009 and later vehicles. On June 30, 2009, the USEPA granted a Clean Air Act waiver, which the state needs in order to implement AB 1493.

Executive Order S-3-05 (EO S-3-05)

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" (CAT) headed by the California Environmental Protection Agency and including several other state 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 emission reduction target required by the EO. In April 2006 the CAT published an initial report that accomplished these two tasks.

Assembly Bill 32 (AB 32)

Signed by the Governor on September 27, 2006, AB 32 codifies a key requirement of EO S-3-05, specifically 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 it estimated could be implemented and would serve to meet about a quarter of the required 2020 emissions reductions (CARB, 2007a). 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 its 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 requires that CARB prepare a comprehensive “scoping plan” that identifies all strategies necessary to fully achieve the required 2020 emissions reductions. Consequently, in early December 2008 CARB released its scoping plan to the public, which was approved by CARB on December 12, 2008.

The scoping plan calls for an achievable reduction in California’s carbon footprint. Reduction of GHG emissions to 1990 levels are proposed, which equates to cutting approximately 30 percent of emissions estimated for 2020, or about 15 percent from today’s levels. The scoping plan relies on existing technologies and improving energy efficiency to achieve the 30 percent reduction in GHG emission levels by 2020. The scoping plan provides the following key recommendation to reduce GHG emissions:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a state-wide renewable energy mix of 33 percent;
- Developing a state-wide cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing State laws and policies, including California’s clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State’s long term commitment to AB 32 implementation.

Executive Order S-01-07 (EO 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 identified in their October 2007 report.

Senate Bill 97 (SB 97)

Signed by the governor on August 24, 2007, SB 97 requires that the Governor’s Office of Planning and Research (OPR) prepare California Environmental Quality Act (CEQA) guidelines for evaluating the

effects of GHG emissions and for mitigating such effects. The Natural Resources Agency adopted these guidelines in December 2009.

The adopted guidelines provide the following direction for consideration of climate change impacts in a CEQA document:

- The determination of significance of GHG emissions calls for a careful judgment by the lead agency.
- The lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate, or estimate the amount of GHG emissions resulting from a proposed project.
- A model or methodology shall be used to quantify GHG emissions resulting from a CEQA project.
- Significance may rely on qualitative analysis or performance based standards.
- The lead agency may adopt thresholds of significance previously adopted or recommended by other public agencies or recommended by experts.
- The CEQA document shall discuss regional and/or local GHG reduction plans.
- A CEQA document shall analyze GHG emissions if they are cumulatively considerable.
- A description of the effects of climate change on the environment shall be included in CEQA documents.
- A CEQA document shall contain mitigation measures, which feasibly reduce GHG emissions.
- GHG analysis in a CEQA document may be Tiered or Streamlined.

It should be noted that this EIS/TEIR is not technically a CEQA document, but rather a “CEQA-like” document that has been prepared in accordance with anticipated State gaming compact requirements.

Diesel Particulate Matter

Diesel particulate matter (DPM) is defined as a Hazardous Air Pollutant (HAP). HAPs are substances that are known or suspected to be emitted and have potential adverse health effects. Currently, there are 188 HAPs listed by USEPA. According to USEPA, the estimated health risk from HAPs can be primarily attributed to relatively few compounds, such as DPM. DPM differs from many other HAPs in that it is not a single substance, but rather a complex mixture of air pollutants, composed of gaseous and solid material. The visible emissions in diesel exhaust are known as particulate matter, which includes carbon particles or “soot.”

3.3.2 BARSTOW SITE

Regional Meteorology

The Barstow site is located in a desert climate. During the summer, a Pacific subtropical high cell that sits off the coast generally influences the Mojave Desert Air Basin (MDAB), inhibiting cloud formation and encouraging daytime solar heating. The MDAB is rarely influenced by cold air masses moving south from Canada and Alaska, as these frontal systems are weak and diffuse by the time they reach the desert. Most desert moisture arrives from infrequent warm, moist, and unstable air masses from the south.

The average annual rainfall at Barstow is approximately 4.4 inches, with 66 percent of the precipitation occurring from November through April. Summer temperatures average 102 °F in July and winter minimum temperatures average 31 °F in December (WRCC, 2005).

Prevailing winds in the Barstow area are out of the west and southwest, a pattern caused by the proximity of the Sierra Nevada Mountains to the north, and air masses that are pushed onshore in Southern California by differential heating and channeled through the MDAB. The MDAB is separated from the Southern California Coastal and Central California Valley regions by mountains (highest elevation approximately 10,000 feet), the passes of which form the main channels for these air masses.

Regional Air Quality

The Barstow site is located in the MDAB. The Mojave Desert Air Quality Management District (MDAQMD) has jurisdiction governing air quality in the MDAB under the delegation and oversight of CARB and the EPA; however, once the project site is taken into trust, the EPA would have sole jurisdiction governing air quality on tribal land. MDAQMD has jurisdiction over the desert portion of San Bernardino County and the far eastern end of Riverside County in accordance with the California Clean Air Act (CCAA). MDAQMD regulates air quality through its permit authority over most types of stationary emissions sources and through its planning and review activities. MDAQMD has adopted attainment plans for a variety of nonattainment pollutants, including the *Mojave Desert Planning Area Federal Particulate Matter Attainment Plan for PM₁₀* and the *Triennial Revision to the 1991 Air Quality Attainment Plan* for ozone. Although it does not have jurisdiction on tribal lands, MDAQMD is the regional agency responsible for protecting public health from air pollution in the MDAB.

NAAQS Designations

As shown in **Table 3.3-2**, the MDAB has been designated nonattainment under the federal 8-hour ozone standard with an attainment deadline of 2021. Because the MDAB is designated severe-17 nonattainment for O₃, the *de minimus* threshold for O₃ precursors (ROG and NO_x) is 25 tons per year. The MDAB has also been designated moderate nonattainment for PM₁₀, and a *de minimus* threshold of 100 tons per year has been established. The MDAB meets the federal standards or is unclassifiable for all other pollutants.

Sensitive Receptors

Some receptors are considered more sensitive than others to air pollutants. The reasons for greater than average sensitivity include pre-existing health problems, proximity to emissions source, or duration of exposure to air pollutants. Schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people, and the infirm are more susceptible to respiratory distress and other air quality related health problems. Residential areas are considered sensitive to poor air quality because people usually stay home for extended periods of time, with greater associated exposure to ambient air quality. Recreational uses are also considered sensitive due to the greater exposure to ambient air quality conditions because vigorous exercise associated with recreation places a high demand on the human respiratory system.

TABLE 3.3-2
MOJAVE DESERT AQMD NAAQS ATTAINMENT STATUS

Pollutant	Federal Attainment Status
Ozone (8-hour)	Nonattainment, Severe-17
Particulate Matter (PM ₁₀)	Nonattainment, moderate
Particulate Matter (PM _{2.5})	Unclassifiable/Attainment
Carbon Monoxide	Attainment
Nitrogen Dioxide	Unclassifiable/Attainment
Sulfur Dioxide	Unclassifiable/Attainment
Source: MDACMD, 2009.	

Surrounding land uses consist of open desert and commercial shopping. The nearest hospital is over three miles from the project site. One school (Lenwood School) is located approximately two miles away. Two miles north of the Barstow site is a recreation corridor, and adjacent to the site is the 33,500-acre Stoddard Valley Off-Highway Vehicle area.

3.3.3 LOS COYOTES SITE

Regional Meteorology

The Los Coyotes site is in the northwest portion of San Diego County, which has a Mediterranean-type climate characterized by hot summers, mild winters, and an almost complete absence of rain for three to four months during the summer. Light to moderate rainfall generally occurs during the winter. A dominating factor in the weather of southern California is the semi-permanent, high-pressure area in the eastern Pacific. This pressure center migrates north in summer, holding storm systems well to the north of the area. Consequently, southern California receives little or no precipitation during the summer. In winter, the Pacific High retreats southward, allowing storm centers to move into and across southern California. These storms bring widespread, moderate precipitation to southern California. The average annual rainfall at the Warner Springs weather station (approximately 5 miles west-northwest of the Los Coyotes site) is 12.85 inches, with 71 percent of the precipitation occurring from November through April. Summer temperatures average 95 °F in July and winter minimum temperatures average 24° F in January (WRCC, 2008).

The Los Coyotes site is surrounded by low mountains interspersed with long valleys. Many of the lower mountains, which dot the vast terrain, rise from 1,000 to 4,000 feet. The San Diego region is bordered on the south by Mexico's high deserts, on the west by the Pacific Ocean, and on the east by the Salton Sea. The prevailing wind directions in the area are west-southwest to west. Average annual wind speed is six miles per hour (mph). Calm wind conditions occur approximately 21 percent of the time. Strong winds and gales are infrequent in the region, with wind speeds over 30 miles per hour occurring only approximately once each year on the average.

Low-level temperature inversions (below 1,500 feet) occur frequently over southern California. Southern California's inversion layer is famous for creating cloudless summer days and for trapping pollutants to form smog. Pollutants in San Diego County stop at the lower mountain slopes, because the inversion layer that traps these pollutants against the slopes hovers around 2,000 feet. Therefore, high mountain locations above 4,000 feet, such as the Los Coyotes site, are relatively free of smog (SDCAPCD, 2005).

Regional Air Quality

The Los Coyotes site is located in the San Diego Air Basin (SDAB). The San Diego Air Basin is comprised of a single air district, the San Diego County Air Pollution Control District (SDCAPCD), which consists of San Diego County. SDCAPCD is responsible for regulating air quality on a local level in San Diego County. SDCAPCD regulates air quality through its permit authority over most types of stationary emissions sources and through its planning and review activities. SDCAPCD has adopted attainment plans for a variety of nonattainment pollutants, including the *2004 Triennial Revision of the Regional Air Quality Strategy for San Diego County* and the *Ozone Redesignation Request and Maintenance Plan for San Diego County*. Although it does not have jurisdiction on tribal lands, SDCAPCD is the regional agency responsible for protecting public health from air pollution in the SDAB.

NAAQS Designations

As shown in **Table 3.3-3**, San Diego County has been designated “basic” nonattainment under the federal 8-hour ozone standard with an attainment deadline of June 2009. However, the EPA has yet to make a change to the ozone attainment status in San Diego County. The nonattainment area is valid for the entire San Diego County with the exception of the San Diego Tribes sub-areas. The Los Coyotes site is not located in one of the San Diego Tribes sub-areas. San Diego County is designated nonattainment for O₃, with an established *de minimus* threshold for O₃ precursors (VOC and NO_x) of 100 tons per year. San Diego County meets the federal standards or is unclassifiable for all other pollutants.

TABLE 3.3-3
SAN DIEGO COUNTY NAAQS ATTAINMENT STATUS

Pollutant	Federal Attainment Status
Ozone (8-hour)	Nonattainment
Respirable Particulate Matter (PM ₁₀)	Unclassifiable
Fine Particulate Matter (PM _{2.5})	Attainment
Carbon Monoxide	Attainment
Nitrogen Dioxide	Attainment
Sulfur Dioxide	Attainment
Source: SDCAPCD, 2010	

Sensitive Receptors

Surrounding land uses consist mainly of grazing land. No hospitals are located within three miles of the site and the nearest school (Warner Union School) is located approximately six miles away. The nearest tribal residence is more than two miles from the project site.

3.4 BIOLOGICAL RESOURCES

This section describes the existing environmental conditions for the proposed Barstow and Los Coyotes sites. 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 **Chapter 4.0**.

3.4.1 BARSTOW SITE

Methodology

For the purpose of this Environmental Impact Statement/Tribal Environmental Impact Report (EIS/TEIR), biological resources are considered to include all plants, vegetation communities and other wildlife habitats, wildlife, and waters of the U.S. Vegetation communities within the project site were identified during literature reviews and further classified (i.e., ground-truthed) during the field surveys. A review of the California Natural Diversity Data Base (CNDDDB) was conducted and species lists were obtained from United States Fish and Wildlife Service (USFWS) and the California Native Plant Society (CNPS) to identify special-status species or other sensitive biological communities potentially present within the site. The CNDDDB and CNPS database queries were conducted for the “Barstow, CA” 7.5-minute quadrangle (quad) and the surrounding eight quads (i.e., Water Valley, Mud Hills, Lane Mountain, Nebo, Daggett, Barstow SE, Hodge, and Hinkley). Field assessments of the Barstow site (project site) and vicinity were conducted on May 3 and 4, 2006. The field assessments were performed by pedestrian survey. All visible fauna and flora were noted and identified to the lowest possible taxonomic level, which is required for accurate identification and reporting. Habitat types present within the project site were characterized and evaluated for their potential to support regionally occurring special-status species. The project site was also assessed for the presence of potentially jurisdictional waters of the U.S. and other biologically sensitive features.

Biological Setting

The 23.1-acre project site is located at the southwestern end of the City of Barstow, San Bernardino County, California. The project site is within the western Mojave Desert and is located within the Desert Floristic Province and the Mojave Desert Geographic Subdivision of California (Hickman, 1993). The dominant vegetation type within this region of California is characteristic of its many alkaline basins and includes Mojave creosote-bush scrub and saltbush scrub. Elevations within the project site range from approximately 728 to 736 meters above mean sea level (amsl) or 2,390 feet to 2,415 feet.

Mojave creosote bush scrub is dominated by shrubs such as creosote bush (*Larrea tridentata*), senna (*Senna armata*), ephedra (*Ephedra nevadensis*), burrobrush (*Hymenoclea salsola*), desert almond (*Prunus* sp.), and white bur-sage (*Ambrosia dumosa*). These shrubs are generally two-to-ten feet tall and widely spaced. Mojave creosote bush scrub generally occurs on well-drained soils on slopes, fans, and in valleys (Holland, 1986). Desert saltbush scrub is generally dominated by gray, microphyllous shrubs that are generally one-to-four feet tall and widely spaced. Typical stands of desert saltbush scrub are strongly dominated by a single species of saltbush (*Atriplex* sp.). Other species known to occur within this vegetation type include honey mesquite (*Prosopis glandulosa*), bush seepweed (*Suaeda moquinii*), hop-

sage (*Grayia spinosa*), and kochia (*Kochia californica*). Desert saltbush scrub normally occurs on fine-textured, poorly drained soils with high alkalinity and/or salinity (Holland, 1986).

Habitat Types

Mojave Creosote Bush Scrub

According to the Holland vegetation classification system, the dominant habitat type within the project site is #34100 Mojave creosote bush scrub (Holland, 1986). Approximately 22.79 acres of Mojave creosote bush scrub habitat was mapped within the project site (**Figure 3.4-1**). **Figure 3.4-2 (Photos 1 and 2)** shows photographs of the Mojave creosote bush scrub habitat type. Creosote bush, saltbush (*Atriplex polycarpa*), white bur-sage, and Mediterranean grass (*Schismus barbatus*) are the dominant plant species observed within this habitat type. The total shrub cover is approximately 12 percent and the total herbaceous vegetation cover is approximately 60 percent.

Ruderal/Developed

Approximately 0.32 acres of ruderal/developed habitat exists on the northeastern region of the project site, where the majority of the vegetation has been removed. Several trailers and tent-like structures are parked within this portion of the project site and it appears that it is being used as a transient (i.e., unsanctioned) camping site (**Figure 3.4-2, Photo 3**).

Waters of the U.S.

The term “waters of the U.S.” is defined in 33 CFR Part 328 as:

- All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- All interstate waters including interstate wetlands;
- All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, 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:
 - i. Which are or could be used by interstate or foreign travelers for recreational or other purposes;
 - ii. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
 - iii. Which are used or could be used for industrial purpose by industries in interstate commerce.

“Wetlands” are defined as:

- Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (38 CFR Part 328).





PHOTO 1: Mojave creosote bush scrub on the Barstow site. View from east to west.



PHOTO 2: Mojave creosote bush scrub on the Barstow site. View from north to southeast.



PHOTO 3: View of Ruderal/Developed habitat. A house had been built and later torn down in this area.

An assessment of potentially jurisdictional waters of the U.S. was conducted by AES during the 2006 field surveys. No potentially jurisdictional wetlands or other waters of the U.S. were observed within the project site during this assessment.

Observed Wildlife

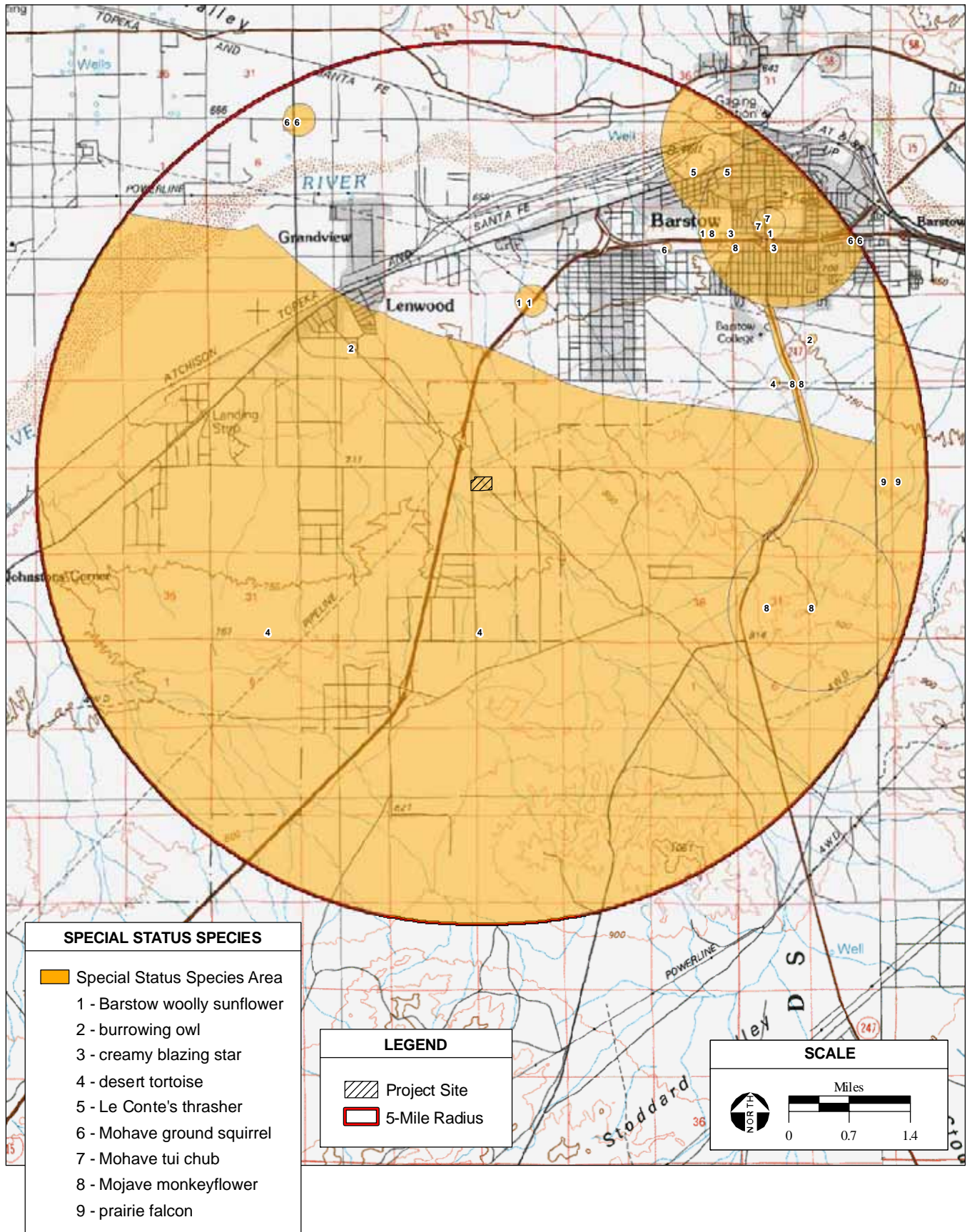
The Mojave creosote bush scrub habitat within the project site provides habitat for a variety of wildlife species. Bird species observed during the field surveys include: mourning dove (*Zenaida macroura*), common raven (*Corvus corax*), horned lark (*Eremophila alpestris*), loggerhead shrike (*Lanius ludovicianus*), barn swallow (*Hirundo rustica*), Gambel's quail (*Callipepla gambelii*), and western tanager (*Piranga ludoviciana*). Mammal species observed include: coyote (*Canis latrans*), antelope ground squirrel (*Ammospermophilus leucurus*), and black-tailed jackrabbit (*Lepus californicus*). One reptile species was observed; western whiptail (*Cnemidophorus tigris*).

Special-Status Species

The USFWS, CNDDDB, and CNPS lists of regionally occurring special-status species are included for reference purposes as **Appendix F**. A list of regionally occurring special-status species reported in the scientific database queries was compiled for the project site and this list is also presented in **Appendix F**. An analysis to determine which of these special-status species have the potential to occur within the project site was conducted. The habitat requirements for each regionally occurring special-status species were assessed and compared to the type and quality of habitats observed on-site during the field surveys. The analysis was also based upon a review of pertinent literature, aerial photographs, site topographic maps, informal consultation with USFWS and local experts, and mapped CNDDDB occurrences of special-status species within a five-mile radius of the project site. Several regionally occurring special-status species were eliminated due to lack of suitable habitat within the project site, elevation range, lack of suitable substrate/soils, and/or distribution. Species determined to have no potential to occur on-site are not discussed further.

All resultant occurrences of special-status species reported within a five-mile radius of the project site were plotted on a map, which is presented as **Figure 3.4-3**. The project site contains suitable habitat for seven special-status species; three plants, one reptile, two birds, and one mammal. **Table 3.4-1** contains those state and CNPS-listed species with suitable habitat on-site that were reported by CNDDDB within five miles of the project site. **Table 3.4-2** consists of the federally listed species that have suitable habitat on-site or are reported to occur within the project site and immediate vicinity.

Special-status species that are formally listed by the state and/or recognized by state agencies, CNPS, or other local jurisdictions because of their rarity or vulnerability to habitat loss or population decline generally receive no specific protection on tribal lands taken into trust by the federal government. Federally recognized Tribes are regarded as independent and sovereign nations. While Tribes have no formal obligation to protect or preserve special-status species other than those that are federally listed, because the Barstow site is not currently federal trust land, potential impacts to state listed species are discussed in **Section 4.4** and mitigation to reduce potential effects to state listed species is recommended in **Section 5.0**. For the purposes of this EIS/TEIR, federally listed species include those plant and animal



SOURCE: California Natural Diversity Database, 2009; "Victorville, CA" USGS 100K Topographic Quadrangle, San Bernadino Baseline & Meridian; AES, 2009

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Figure 3.4-3
Special Status Species Within 5 Miles of the Barstow Site

TABLE 3.4-1
STATE AND CNPS SPECIAL-STATUS SPECIES LIST FOR THE BARSTOW SITE

SCIENTIFIC NAME COMMON NAME	STATE/ CNPS STATUS	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION
PLANTS				
<i>Eriophyllum mohavense</i> Barstow woolly sunflower	--/1B	San Bernardino County	Chenopod scrub, Mojavean desert scrub, and playas; elevation 1,640-3,150 feet.	April-May
<i>Mentzelia tridentata</i> Creamy blazing star	--/1B	Imperial, Inyo, Kern, Riverside, San Bernardino, and San Diego Counties	Mojavean desert scrub; elevation 2,300-3,805 feet.	March-May
<i>Mimulus mohavensis</i> Mojave monkeyflower	--/1B	San Bernardino County	Joshua tree woodland and Mojavean desert scrub in gravelly areas; elevation 1,970-3,935 feet.	April-June
ANIMALS				
Reptiles				
<i>Gopherus agassizii</i> Desert tortoise	FT	In California, occurs throughout major portions of the Mojave and Sonoran deserts, generally between 2000-3300 feet in elevation.	Within the West Mojave Desert, primarily occur in creosote bush scrub, with lower densities occurring in Joshua tree woodland and saltbush scrub.	March-October
Birds				
<i>Athene cunicularia</i> Western burrowing owl	CSC/--	Formerly common within the described habitats throughout the state except the northwest coastal forests and high mountains.	Yearlong resident of open, dry grassland and desert habitats, as well as in grass, forb and open shrub stages of pinyon-juniper and ponderosa pine habitats.	All Year
<i>Toxostoma lecontei</i> Le Conte's Thrasher	CSC/--	An uncommon to rare local resident in Southern California deserts from Inyo County south to the Mexican border and in western and southern San Joaquin Valley.	Occurs primarily in open desert wash, desert scrub, alkali desert scrub, and desert succulent shrub habitats; also occurs in Joshua tree habitat.	All Year
Mammals				
<i>Spermophilus mohavensis</i> Mohave ground squirrel	CT/--	Restricted to the Mojave Desert in San Bernardino, Los Angeles, Kern, and Inyo Counties. Populations in southwestern San Bernardino County appear to be extirpated.	Optimal habitats are open desert scrub, alkali desert scrub, and Joshua tree. Also feeds in annual grasslands.	All Year
STATUS CODES				
STATE: California Department of Fish and Game				
CT Listed as Threatened by the State of California				
CSC California Species of Special Concern				
CNPS: California Native Plant Society				
List 1B Plants rare or endangered in California and elsewhere				
Source: California Department of Fish and Game, 2003; CNPS, 2009.				

TABLE 3.4-2
FEDERAL SPECIAL-STATUS SPECIES LIST FOR THE BARSTOW SITE

SCIENTIFIC NAME COMMON NAME	FEDERAL STATUS	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION
ANIMALS				
Reptiles				
<i>Gopherus agassizii</i> Desert tortoise	FT	In California, occurs throughout major portions of the Mojave and Sonoran deserts, generally between 2000-3300 feet in elevation.	Within the West Mojave Desert, primarily occur in creosote bush scrub, with lower densities occurring in Joshua tree woodland and saltbush scrub.	March-October
STATUS CODES				
FEDERAL: U.S. Fish and Wildlife Service and National Marine Fisheries Service				
FT Listed as Threatened by the Federal Government				
Source: U.S. Fish and Wildlife Service, 2009.				

species that are listed as endangered or threatened under the Federal Endangered Species Act (FESA), or formally proposed for listing.

State and CNPS Listed Species

Plant Species

Three CNPS List 1B plant species are reported within five miles of the Barstow site and have potential to occur on-site: Barstow woolly sunflower (*Eriophyllum mohavense*), creamy blazing star (*Mentzelia tridentata*), and Mojave monkeyflower (*Mimulus mohavensis*). None of these species were observed during the field assessment on May 3 and 4, 2006, which was conducted during the blooming season for these species.

Bird Species

Two bird species, which are both California species of special concern, are reported within five miles of the Barstow site and have potential to occur on-site: western burrowing owl (*Athene cunicularia*) and Le Conte's thrasher (*Toxostoma lecontei*). Suitable nesting and foraging habitat exists for these bird species on-site. A third bird species, the prairie falcon (*Falco mexicanus*) is reported within five miles of the Barstow site (**Figure 3.4-3**). This species has no special federal or state status, but is tracked by the CNDDDB. No suitable nesting habitat for this species exists on-site, but there is marginally suitable foraging habitat on-site. Neither of these three species were observed during the May 3 and 4, 2006 field assessment, which was conducted during the appropriate identification period for these birds.

Mammal Species

State threatened Mojave ground squirrel (*Spermophilus mohavensis*) is the only state-listed mammal species that is reported to occur within five miles of the project site that has potential to occur on-site. Mohave ground squirrel was not observed during the May 3 and 4, 2006 field assessment, which was conducted during the appropriate identification period for this species.

Federally Listed Species

Plant Species

Five federally listed plant species occur within San Bernardino County. Four of these five species, Cushenbury buckwheat (*Eriogonum ovalifolium* var. *vineum*), Cushenbury milk-vetch (*Astragalus albens*), Cushenbury oxytheca (*Oxytheca parishii* var. *goodmaniana*), and Parish's daisy (*Erigeron parishii*), occur primarily in carbonate deposits or soils derived from them, in the San Bernardino Mountains. Neither this habitat nor range approximates the habitat or range in which the project site occurs. Likewise, the project site is below the range of elevation that these four plant species are known to occur. The project site is also below the known range of elevation for the fifth federally listed plant, Lane Mountain milk-vetch (*Astragalus jaegerianus*). Soils on the project site do not provide habitat for Lane Mountain milk-vetch, as most plants of this species occur in shallow soils. The soils on-site are deep, mapped as Cajon Sand, 2 to 9 percent slopes (USDA, 1986). None of the five federally listed plant species known to occur within San Bernardino County have been documented within a five-mile radius of the project site. Cushenbury milk-vetch, Lane Mountain milk-vetch, Parish's daisy, Cushenbury

buckwheat, and Cushenbury oxytheca were not observed within the project site during the May 3-4 field assessment, which was conducted during the blooming season for these federally-listed plant species.

Amphibian and Fish Species

All federally listed amphibian and fish species that occur in San Bernardino County, including arroyo toad (*Bufo microscaphus californicus*), bonytail chub (*Gila elegans*), Mohave tui chub (*Gila bicolor mohavensis*), and razorback sucker (*Xyrauchen texanus*), require intermittent or perennial aquatic habitat for survival. Suitable habitat for these species is not present within the project site.

Bird Species

Four federally listed bird species occur in San Bernardino County, including least Bell's vireo (*Vireo bellii pusillus*), southwestern willow flycatcher (*Empidonax tailii extimus*), yellow-billed cuckoo (*Coccyzus americanus*), and Yuma clapper rail (*Rallus longirostris yumanensis*). All of these species require some form of intermittent or perennial aquatic habitat. The least Bell's vireo, southwestern willow flycatcher, and yellow-billed cuckoo require dense riparian habitat types. The project site and vicinity lack riparian habitat. Yuma clapper rail requires marsh habitat, which does not occur within the project site or immediate vicinity.

Reptile Species

One federally listed threatened reptile species, desert tortoise (*Gopherus agassizii*) occurs in San Bernardino County. This species is also listed as "threatened" by the state. Desert tortoise has the potential to occur within the Mojave creosote bush scrub habitat on-site. A more detailed description of this species is provided below.

Desert Tortoise (*Gopherus agassizii*)

Federal Status – Threatened

The desert tortoise is a medium-sized, terrestrial reptile. It is a long-lived animal (maximum age in the wild is likely about 50 to 70 years) that begins reproducing at approximately 12 to 15 years of age. Desert tortoise activity patterns are primarily determined by ambient temperature and precipitation. They lay most of their eggs in the spring and, to a lesser extent, in the fall. Most precipitation in the West Mojave Desert occurs during the winter; therefore, most vegetation grows in the spring, and dries up by late May or June. Tortoises in the West Mojave are primarily active between May and June, with a secondary activity period from September through October. Tortoises may be seen, to a lesser extent, outside of these periods. Within the West Mojave Desert, the highest tortoise population densities are found in Mojave creosote bush scrub, with lower densities occurring in Joshua tree woodland and saltbush scrub (BLM, 2006a).

The project site is dominated by Mojave creosote bush scrub with evidence of a transition to saltbush scrub. Mojave creosote bush scrub is suitable habitat for the desert tortoise. However, the transitional nature of the habitat reflects the less-than-optimal quality of the habitat for desert tortoises. The project site is located adjacent to paved roads and outlet malls, undeveloped land used as an off highway vehicle (OHV) site, and privately owned vacant land fronting on the paved road. CNDDDB's mapping of the

project site places the site within the boundaries of one of California's primary desert tortoise populations (an area of approximately 1,700 square miles). According to USFWS's mapping, the project site is not located within designated critical habitat for the desert tortoise (59 FR 5820-5866). During the May 3-4, 2006, field surveys, no evidence of desert tortoise (sightings, burrows, scat, tracks, or carcasses) was observed. The chance of occurrence of desert tortoise within the project site is considered low.

3.4.2 LOS COYOTES SITE

Methodology

For the purpose of this EIS/TEIR, biological resources are considered to include all plants; vegetation communities and other wildlife habitats; wildlife; and waters of the U.S. Vegetation communities were identified during literature reviews and surveys. As done for the Barstow site, a review of the CNDDDB was conducted and species lists were obtained from USFWS and the CNPS to identify special-status species or other sensitive biological resources potentially present on the three sites. A field assessment of the Los Coyotes site and vicinity was conducted on May 2, 2006. The field assessment was performed by pedestrian survey. All visible fauna and flora were noted and identified to the lowest possible classification; habitat types occurring in the study area were characterized and evaluated for their potential to support regionally occurring special-status species. The site was also assessed for the presence of waters of the U.S. and other biologically sensitive features.

Biological Setting

The Los Coyotes site is located within the Los Coyotes Reservation in San Diego County, California. Characteristic plant communities that occur in the region are non-native grassland and coast live oak woodland. Non-native grassland typically occurs below 3000 feet, but can exist as high as 4000 feet in the Tehachapi Mountains and in interior San Diego County. Plant species that are characteristic of non-native grasslands can include wild oat (*Avena fatua*), *Bromus* spp., storksbill (*Erodium* spp.), tarplant (*Hemizonia* spp.), goldfields (*Lasthenia* spp.), *Layia* spp., *Lupinus* spp., peppergrass (*Lepidium dictyotum*), baby blue eyes (*Nemophila menziesii*), *Orthocarpus* spp., and *Phacelia* spp. (Holland, 1986). Coast live oak woodland is typically found below 4000 feet in elevation. The dominant tree that characterizes this habitat is coast live oak (*Quercus agrifolia*). The shrub layer is often poorly developed, but can include blue elderberry (*Sambucus mexicana*), *Ribes* spp., or toyon (*Heteromeles arbutifolia*). The herb layer is often dominated by ripgut brome (*Bromus diandrus*) and other grasses (Holland, 1986).

The Los Coyotes site ranges in elevation from approximately 4,500 feet above mean sea level (amsl) on the southwestern corner, to approximately 4,585 feet amsl on the northeastern corner. The site topography consists of terrain sloping gently to the south. The terrain slopes steeply to a higher elevation directly outside of the project site on both the east and west sides. Soil on the site is described as loamy alluvial sands and loamy course sands.

Habitat Types

Non-Native Grassland

The majority of the site consists of a non-native grassland community, comprising 11.19 acres (**Figure 3.4-4**). The dominant species within this habitat are buckwheat (*Eriogonum wrightii*), goldfields (*Lasthenia californica*), storksbill (*Erodium cicutarium*), and cheatgrass (*Bromus tectorum*). The subdominant species include *Lupinus* spp. and popcornflower (*Plagiobothrys nothofulvus*) (**Figure 3.4-5, Photo 8**).

Coast Live Oak Woodland

Approximately 5.77 acres of coast live oak woodland occurs in the northern and southern thirds of the project site. The dominant species present in this habitat includes coast live oak (*Quercus agrifolia*), canyon live oak (*Quercus chrysolepis*), and ripgut brome (*Bromus diandrus*). The subdominant species include miner's lettuce (*Claytonia perfoliata*) and California coffeeberry (*Rhamnus californica*) (**Figure 3.4-5, Photo 9**).

Intermittent Channel

San Ysidro Creek, an intermittent channel, exists immediately to the west of the Los Coyotes site (**Figure 3.4-5, Photo 11**). Approximately 0.19 acres of this channel occur within the Los Coyotes site. This channel has a sandy bottom and varies between 1 and 10 feet in width. The channel runs between the Los Coyotes site and the existing gravel road. Vegetation was very limited within the channel as the sandy base did not allow for much growth, but several grasses including soft chess (*Bruomus hordeaceus*), cheatgrass (*Bromus tectorum*), bulbous barley (*Hordeum murinum*), and ripgut broam (*Bromus diandrus*) grew along the banks of the channel.

Seasonally Wet Depressions

A large seasonally wet depression occurs south of the project site (**Figure 3.4-5, Photo 10**). A small portion of this wetland, 0.016 acres, exists within the project site, on the southern boundary of the site. The dominant species in this wetland area include willow (*Salix* sp.), *Juncus* sp., and barley (*Hordeum murinum*). Hydric soil indicators such as low chroma color values are present in this wetland area.

Waters of the U.S.

The Los Coyotes site is located in the San Luis Rey watershed. San Ysidro Creek, Cougar Canyon Creek, and Borrego Palm Canyon Creek are the main streams that run through the Los Coyotes reservation. The survey site is located near San Ysidro Creek, Panawatt Springs, Blackwater Hole, and Weowlet Spring.

An assessment of potential waters of the U.S. was conducted by AES during the May 2006 field survey. San Ysidro Creek, an intermittent channel, runs along the western boundary of the survey site. A small segment of a larger seasonal wetland extends into the southern boundary of the project site. The portion of the seasonal wetland within the project site is 0.016 acres. This wetland area is discussed above.

Figure 3.4-6 shows the location of these waters.

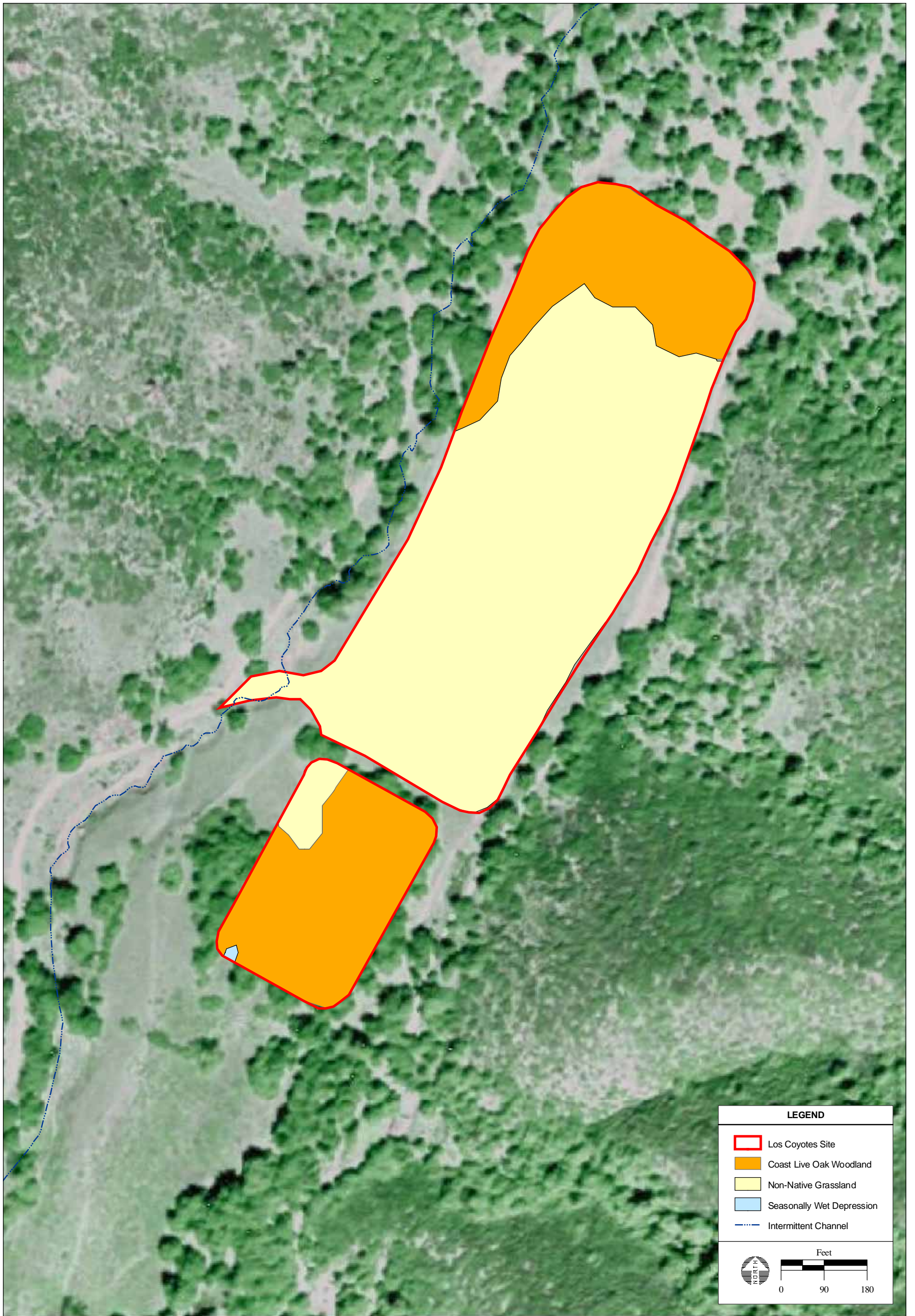




PHOTO 8: Non-native grassland habitat on the Los Coyotes site. View from north to south.



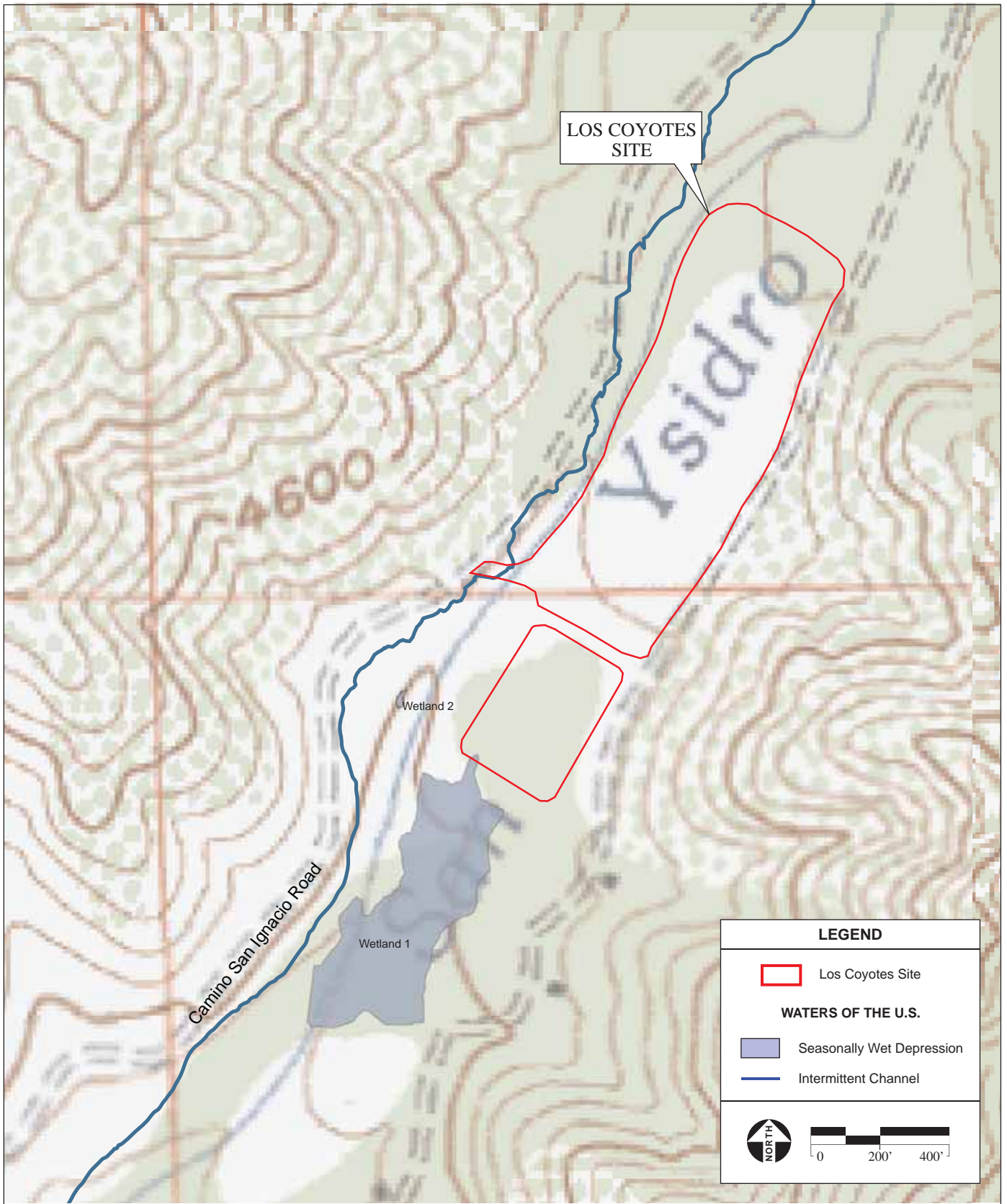
PHOTO 9: Coast live oak woodland habitat on the Los Coyotes site. View from the northern portion of the site, looking north.



PHOTO 10: Large seasonal wetland immediately south of the Los Coyotes site. View from south to north onto site.



PHOTO 11: San Ysidro Creek, a seasonal drainage immediately west of the Los Coyotes site. View from north to south.



SOURCE: Hot Springs Mt., CA" USGS 7.5 Minute Topographic Quadrangle, Section 26, T10S R4E, San Bernadino Baseline & Meridian; AES, 2009

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Figure 3.4-6
Waters of the U.S. – Los Coyotes Site

OBSERVED WILDLIFE

A variety of wildlife may use the habitats on the project site. The bird species observed on-site include: western bluebird (*Sialia mexicana*), red-tailed hawk (*Buteo jamaicensis*), Steller's jay (*Cyanocitta stelleri*), lesser nighthawk (*Chordeiles acutipennis*), Nuttall's woodpecker (*Picoides nuttallii*), acorn woodpecker (*Melanerpes formicivorus*), Anna's hummingbird (*Calypte anna*), lark sparrow (*Chondestes grammacus*), barn owl (*Tyto alba*), European starling (*Sturnus vulgaris*), house finch (*Carpodacus mexicanus*), band-tailed pigeon (*Columba fasciata*), yellow warbler (*Dendroica petechia*), oak titmouse (*Baeolophus inornatus*) and white-breasted nuthatch (*Sitta carolinensis*). Mammal species observed on-site include: pocket gopher (*Thomomys bottae*) and beechey ground squirrel (*Spermophilus beecheyi*). Mule deer (*Odocoileus hemionus*) and cattle (*Bos taurus*) tracks and scat were also seen on the project site.

Special Status Species

Methodology

The list of special status species that may be potentially impacted by developing the Los Coyotes site was generated based upon the same parameters as discussed for the Barstow site. Each resource was evaluated to generate a State and CNPS Special Status Species Table and a Target Species Table for the site (**Table 3.4-5** and **Table 3.4-6**). A map of special status species within a five-mile radius of the site is shown in **Figure 3.4-7**. The federal species list that addressed species occurring within the 25,050 acre Los Coyotes Reservation, obtained from the Carlsbad USFWS office was used to determine federal species potential to occur on the Los Coyotes site (**Appendix F**).

State and CNPS listed Species

Plant Species

Otay manzanita (*Arctostaphylos otayensis*) is the only state and/or CNPS listed plant species that is reported to occur within five miles of the project site and has potential habitat on and within the immediate vicinity of the project site. This species was not observed during the May 2, 2006 field assessment conducted by AES. Although the field assessment was not conducted during the blooming season for this plant, Otay manzanita is a perennial evergreen shrub and would have been identifiable to the genus level at a minimum at the time of the survey. No *Arctostaphylos* species were observed on the project site. This species does not occur in the project site.

Mammal Species

Two special-status mammal species are reported to occur within five miles of the project site and have suitable habitat on and within the immediate vicinity of the site: Dulzura pocket mouse (*Chaetodipus californicus femoralis*) and Stephens' kangaroo rat (*Dipodomys stephensi*). Stephens' kangaroo rat is federally listed and discussed in the Federal Species section. Neither of these special-status mammal species were observed during the May 2, 2006 field assessment, which was conducted during the reasonable identification period for these species.

TABLE 3.4-3
STATE AND CNPS SPECIAL-STATUS SPECIES LIST FOR THE LOS COYOTES SITE




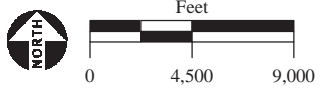
SCIENTIFIC NAME COMMON NAME	STATE/ CNPS STATUS	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION
PLANTS				
<i>Arctostaphylos otayensis</i> Otay manzanita	--/1B	San Diego County.	Chaparral and cismontane woodland/ metavolcanic; elevation 900-5575 feet.	January - March
Mammals				
<i>Chaetodipus californicus</i> <i>femorialis</i> Dulzura pocket mouse	CSC/--	Distributed in California from San Francisco Bay south to the border of Mexico and east to the edge of the Great Valley.	Inhabits coastal scrub, chamise- redshank and montane chaparral, sagebrush, annual grassland, valley foothill hardwood, valley-foothill hardwood-conifer, and montane hardwood habitats.	All year
STATUS CODES				
STATE: California Department of Fish and Game				
CE Listed as Endangered by the State of California				
CT Listed as Threatened by the State of California				
CSC California Species of Special Concern				
CNPS: California Native Plant Society				
List 1A Plants presumed extinct in California				
List 1B Plants rare or endangered in California and elsewhere				
List 2 Plants rare or endangered in California, but more common elsewhere				
Source: U.S. Fish and Wildlife Service, 2006a; California Department of Fish and Game, 2003; CNPS, 2009.				

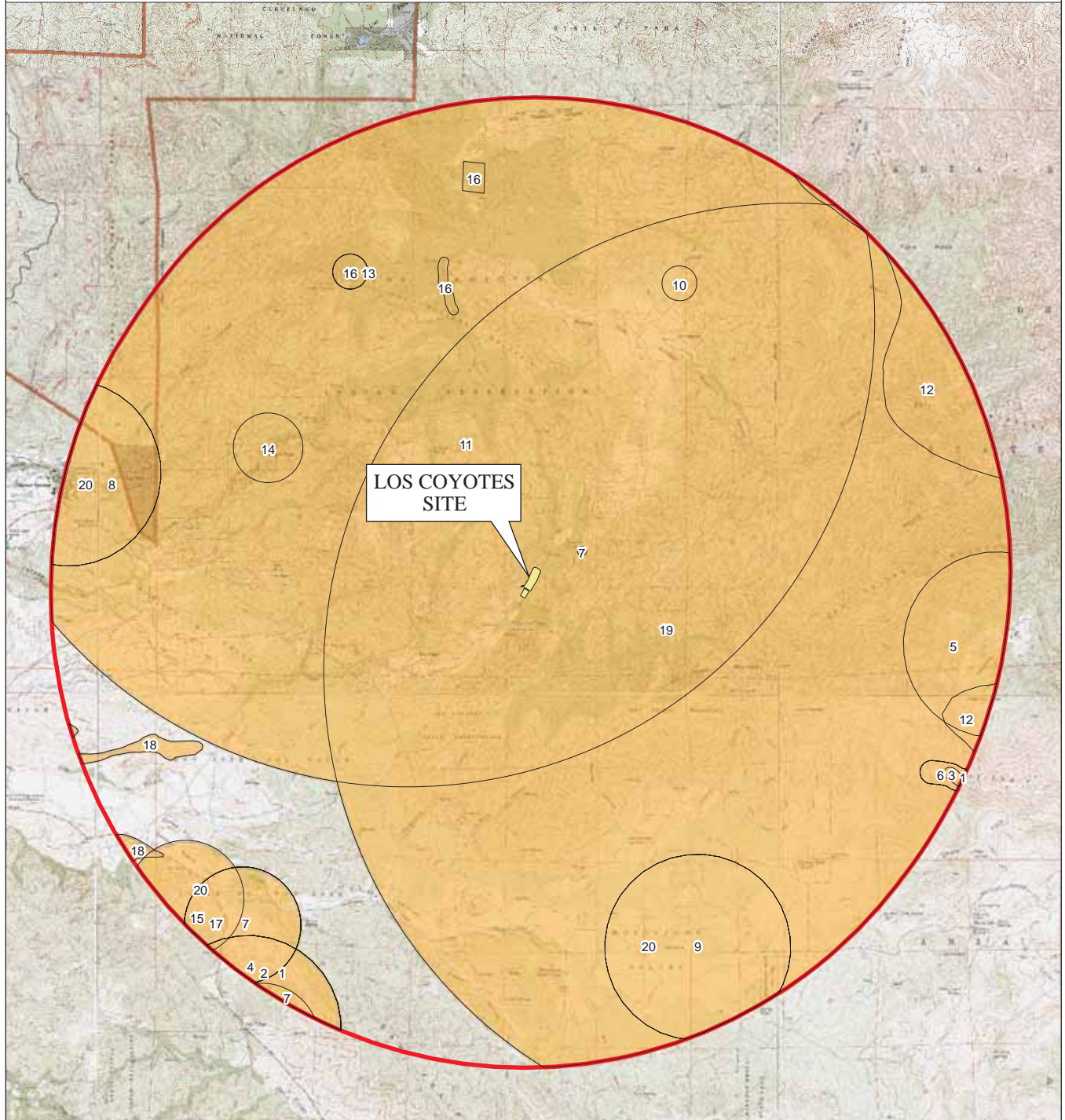
TABLE 3.4-4
FEDERAL SPECIAL-STATUS SPECIES LIST FOR THE LOS COYOTES SITE

SCIENTIFIC NAME COMMON NAME	FEDERAL STATUS	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION
ANIMALS				
Amphibians				
<i>Bufo californicus</i> arroyo toad	FE	Southern California and Baja California, Mexico.	Intermediate drainages and streams with minimal current or shallow, gravelly pools that persist until at least July.	March to July
Birds				
<i>Empidonax traillii extimus</i> Southwestern willow flycatcher	FE	Breeding sites range from California (south of the Santa Ynez River), New Mexico, the extreme southwest of Colorado, the extreme southern portions of Nevada and Utah, western Texas, and Baja California, del Norte, and Sonora, Mexico.	Dense riparian habitats along rivers, streams, or other wetlands.	May to July
<i>Vireo bellii pusillus</i> Least Bell's vireo	FE/CE/--	The entire range of the subspecies consists of the southwestern coastline of the United States in California below Santa Barbara, extending inland approximately to the edge of the Imperial Valley. The breeding range for this species encompasses greater Los Angeles and other metropolitan areas of southern California. The wintering habitat includes Baja California, Mexico, and the western coastline of northern and central Mexico.	Occupies dense, low, shrubby vegetation, generally early successional stages in riparian area, brushy fields, young second-growth forest or woodland, scrub oak, coastal chaparral, and mesquite brushlands, often near water in arid regions. The most critical structural component of the Least Bell's Vireo breeding habitat in California is a dense shrub layer, 0.6-3.0 m above ground.	May to August
Mammals				
<i>Dipodomys stephensi</i> Stephens' kangaroo rat	FE	The San Jacinto Valley from Riverside, Riverside and San Diego Counties, and south to the vicinity of Vista.	Annual and perennial grassland, including buckwheat, chamise, brome grass, and filaree, or coastal scrub or sagebrush with sparse canopy cover.	All year.
STATUS CODES				
FEDERAL: U.S. Fish and Wildlife Service and National Marine Fisheries Service				
FE Listed as Endangered by the Federal Government				
FT Listed as Threatened by the Federal Government				
FC Federal candidate for listing				
Source: USFWS, 2006a; USFWS 2010.				

LEGEND

- | | | |
|------------------------------------|--------------------------------|---------------------------------|
| 1 - ayenia | 8 - leafy buckwheat | 15 - San Felipe monardella |
| 2 - Borrego Valley pepper-grass | 9 - Nevin's barberry | 16 - San Felipe monardella |
| 3 - bristly scaleseed | 10 - Orcutt's linanthus | 17 - southern grasshopper mouse |
| 4 - chaparral sand-verbena | 11 - Otay manzanita | 18 - Stephens' kangaroo rat |
| 5 - Desert Fan Palm Oasis Woodland | 12 - peninsular bighorn sheep | 19 - summer holly |
| 6 - desert spike-moss | 13 - San Diego County alumroot | 20 - Warner Springs lessingia |
| 7 - Dulzura pocket mouse | 14 - San Diego sunflower | |

 Special Status Species Areas
 5-Mile Radius
 Los Coyotes Site




SOURCE: "Hot Springs Mt., CA" USGS 7.5 Minute Topographic Quadrangle, Section 26, T10S R4E, San Bernadino Baseline & Meridian; California Natural Diversity Database, 2005; AES, 2009

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Figure 3.4-7
Special Status Species Within 5 Miles of the Los Coyotes Site

Sensitive habitat

One sensitive habitat, the desert fan palm oasis, was identified within a five-mile radius of the site in the CNDDDB query. This habitat type was not observed during the May 2, 2006 field assessment conducted by AES.

Federally Listed Species**Amphibian Species**

One federally listed amphibian species, the arroyo toad (*Bufo californicus*) has the potential to occur within the Los Coyotes Reservation.

Arroyo Toad (*Bufo californicus*)

Federal Status – Endangered

The arroyo toad is nocturnal and buries itself in soil within the streambed during the day. Adult toads emerge at night between late March and early July. Small to intermediate drainages and streams provide habitat for the arroyo toad. Optimal habitat includes streams with minimal current or shallow, gravelly pools that persist until at least July. The arroyo toad is found in isolated populations in southern California and Baja California, Mexico.

The nearest recorded occurrence of arroyo toad to the project site is approximately 8.5 miles northwest of the project site, at the Indian Flats campground, near San Luis Rey River, and was recorded in 1991 (CDFG, 2003). Critical habitat for this species does exist approximately 8 miles to the west of the project site, in the Warner Springs quadrangle (USFWS, 2006b). No critical habitat for arroyo toad exists within the project site. The portion of San Ysidro Creek that runs within and adjacent to the project site does not provide suitable breeding habitat for arroyo toad because the drainage does not have persistent water flow or pools. Small pools and wetland area that could potentially be suitable for arroyo toad breeding were observed in and adjacent to San Ysidro Creek approximately 200 yards downstream of the project site. If arroyo toads occur in these pools and wetland area, they may infrequently occur on the project site, as arroyo toads can range up to a kilometer from their breeding areas during the nonbreeding season. The arroyo toad was not observed during a May 2006 field survey conducted by AES.

Bird Species

Two federally listed bird species, the Southwestern willow flycatcher (*Empidonax traillii extimus*), and least Bell's vireo (*Vireo bellii pusillus*) have the potential to occur within the Los Coyotes Reservation.

Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

Federal status – Endangered

The Southwestern willow flycatcher is one of four, possibly five willow flycatcher subspecies. The breeding site of the Southwestern willow flycatcher typically consists of dense riparian habitat along rivers, streams, or other wetlands. Vegetation that may be present at the breeding site includes willows (*Salix* sp.), seepwillow (*Baccharis* sp.), tamarisk and Russian olive (*Elaeagnus angustifolia*), or other shrubs or medium sized trees. The Southwestern willow flycatcher is most active between approximately one hour prior to sunrise and 10 am. Breeding and nesting takes place between May and July. Breeding sites

for this bird occur in California (south of the Santa Ynez River), New Mexico, the extreme southwest of Colorado, the extreme southern portions of Nevada and Utah, western Texas, and Baja California, del Norte, and Sonora, Mexico.

The nearest critical habitat for the Southwestern willow flycatcher to the project site is approximately 8 miles to the southwest (USFWS 2006b). The San Diego Management Unit, within the coastal California Recovery Unit for the Southwestern willow flycatcher exists near Lake Henshaw, approximately 9 miles from the project site (USFWS, 2002b). No suitable habitat for this species exists on the Los Coyotes site. A patch of suitable nesting habitat occurs approximately one-quarter mile southwest (downstream) of the site, along San Ysidro Creek. The habitat consists of approximately one acre of willow thicket adjacent to San Ysidro Creek. At this location, the creek had small pools of water during a May 2, 2006 field survey. The habitat meets criteria for consideration as willow flycatcher habitat; however, it is a small and relatively isolated patch of habitat. Furthermore, the closest CNDDDB record is approximately 25 miles from the site. The southwestern willow flycatcher was not observed during field surveys conducted by AES in May 2006. The May field visit was performed during the nesting period for this bird. This species is not expected to occur at the Los Coyotes site.

Least Bell's vireo (*Vireo bellii pusillus*)

Federal Status – Endangered

The least Bell's vireo is a summer resident of cottonwood-willow forest, oak woodland, shrubby thickets, and dry washes with willow thickets at the edges. It was formerly a common and widespread summer resident below about 2000 ft in elevation in the western Sierra Nevada, throughout Sacramento and San Joaquin valleys, and in the coastal valleys and foothills from Santa Clara County south. Currently, its breeding range is in Southern California, with large populations in Riverside and San Diego counties and smaller populations in Santa Barbara, Ventura, and San Diego counties, and in northern Baja California. Thickets of willow and other low shrubs, preferably with water nearby, afford nesting and roosting cover.

The project site is not within critical habitat for the least Bell's vireo. Critical habitat exists approximately 7 miles to the northeast of the project site (USFWS, 2006b). The Los Coyotes site is not within any of the 14 population/metapopulation units described in the 1998 Draft Recovery Plan for the least Bell's vireo (USFWS, 1998). The closest documented occurrence of the least Bell's vireo is approximately 5.5 miles east of the Los Coyotes site, and several occurrences are documented within 10 miles of the site. A relatively small amount of willow thicket exists approximately .25 miles southwest (downstream) of the site along San Ysidro Creek. This willow thicket, however, does not represent suitable habitat for the bird. The least Bell's vireo generally nests below an elevation of approximately 2,000 feet amsl. The nearby occurrences are all below an elevation of 3,000 feet. The Los Coyotes site is located at approximately 4,400 feet amsl, considerably higher than typical nesting habitat for this bird. The least Bell's vireo was not observed during field surveys conducted by AES in May 2006. This species is not expected to occur at the Los Coyotes site.

Mammal Species

One federally listed mammal species, the Stephens' kangaroo rat (*Dipodomys stephensi*) has the potential to occur on the Los Coyotes Reservation.

Stephens' Kangaroo Rat (*Dipodomys stephensi*)

Federal status – Endangered

Habitat for the Stephens' kangaroo rat includes annual and perennial grassland, including buckwheat, chamise, brome grass, and filaree, or coastal scrub or sagebrush with sparse canopy cover. The Stephens' kangaroo rat is nocturnal and active year round. Breeding occurs from April to June. This species inhabits the San Jacinto Valley from the City of Riverside, Riverside County, south to the vicinity of Vista, San Diego County.

No critical habitat has been designated for Stephens' kangaroo rat. Record of a population of this species exists approximately four miles south west of the site (CDFG, 2003) and an additional population exists at Warner Ranch, approximately six miles west of the site. The Central Conservation Planning Area, as listed in the 1997 Draft Recovery Plan for this species, is west of the site, near Lake Henshaw (USFWS, 1997). Suitable habitat for the Stephens' kangaroo rat exists on-site. This rodent was not observed during field surveys conducted by AES in May 2006.

3.5 CULTURAL AND PALEONTOLOGICAL RESOURCES

This section describes the existing environmental conditions for the proposed Barstow and Los Coyotes sites. The general and site-specific profiles of cultural resources contained herein provide the environmental baseline by which direct, indirect, and cumulative environmental effects are identified and measured in **Chapter 4.0**.

3.5.1 SETTING

Prehistory

Barstow Site Vicinity

The earliest accepted archaeological manifestation in the Far West is the Fluted Point Tradition (FPT), which is typified by a highly specialized flaked stone technology. The FPT, dated to the terminal Pleistocene (ca. 12,000 – 10,000 Before Present [B.P.]), is often associated with the hunting of large, now extinct, megafauna, although recent investigations suggest a more broad-spectrum subsistence strategy focused on ancient pluvial lakes and marshes. Artifacts related to the FPT have also been found in association with streams, springs, ponds, river terraces, and high mountain passes in California. Archaeological sites in California that have yielded artifacts related to the FPT include Tracy Lake (Beck 1971), Ebbetts Pass (Davis and Shutler 1969), Borax Lake (Harrington and Simpson 1948; Meighan and Haynes 1970), Tulare Lake (Riddell and Olsen 1969), and China Lake (Davis 1978).

During the early Holocene epoch, the FPT gave way to the Western Pluvial Lakes Tradition (WPLT) (Bedwell 1973). As the name suggests, the WPLT reflects a settlement and subsistence strategy focused on the large lakes fed by receding glaciers west of the Rocky Mountains. In California, a number of regional appellations have been given to archaeological cultures related to the tradition, most notably the Lake Mojave Complex and the San Dieguito Complex. The following prehistoric cultural history of the Mojave Desert is based on Warren (1984:409-430).

The Lake Mojave Period (8,000 to 5,000 B.C.) followed the FPT and reflects a more generalized adaptive strategy, which was first identified on the margins of the former Lake Mojave and associated environs. The temporally diagnostic artifacts associated with this period include Lake Mojave or Silver Lake projectile points that are found primarily in association with the shorelines of former pluvial lakes. Hunting and utilization of lacustrine resources presumably formed the subsistence base.

The Pinto Period (5,000 to 2,000 B.C.) follows the Lake Mojave Period and is characterized by the presence of Pinto Series projectile points. The Pinto Period likely reflects an occupation of the desert after a period of lake desiccation. This period of drying is related to the use of stream and spring habitats. Pinto Period sites appear to be a broadly generalized cultural pattern developed in response to the disappearance of lakes as a result of a change to a more arid climatic regime. It is possible that the Pinto Period developed directly from the Lake Mojave Period and ushered in the Archaic (a more generalized subsistence economy) in the Mojave Desert.

The Gypsum Period (2,000 B.C. to 500 A.D.) is marked by the presence of Elko Series projectile points. Very little is known regarding the subsistence base or social organization of Gypsum groups as few sites dating from this period have been excavated. Archaeological remains dating from the Gypsum Period are relatively uncommon in the Mojave Desert, signifying that sites from this period are rare or underrepresented in the known archaeological record. Sites that have been identified from this period reflect a proliferation of manos and metates, representing a shift toward a hard seed economy and perhaps influences from the Southwest, signaling increased trade.

The Saratoga Springs Period (A.D. 500 to 1200) is marked by Rose Spring and Eastgate Projectile Points. Rose Spring projectile points are similar in form to Elko Series points but are smaller, and signal the introduction of the bow and arrow. Sites from this period are some of the most common found in the Mojave Desert and represent a more diverse economic base, larger populations, and a highly mobile lifestyle. As well, this time marks the beginning of the Hakataya influence in the Southern Mojave Desert.

The Protohistoric Period (A.D. 1200 to Contact) is associated with Desert side-notched projectile points, increased reliance on hard-seed economies, and extensive trade networks. Southwestern pottery, including Colorado Buff Wares and locally produced Tizon Brown Ware, and other trade goods such as shell beads from the California coast are found throughout sites that date to this period. This period is assumed to reflect the late prehistory of the ethnographic groups inhabiting the region.

Los Coyotes Site Vicinity

Recent archaeological discoveries at Lake Elsinore and Domenigoni Valley place humans in this part of southern California as early as 8,000 to 9,000 years ago. Over the years there have been many sequences and chronologies proposed for the prehistoric cultural history of inland southern California, but at the present time there is not enough archaeological data to fine-tune these sequences into units any smaller than a few, very broadly defined periods. The various existing schemes are summarized by Grenda (1993) and Moratto (1984), who offer the following basic timeline:

9,000 to 8,000 B.P.	San Dieguito Period
8,000 to 1,500 B.P.	Millingstone/Pauma/Archaic/Encinitas Tradition
1,500 to Contact	Late Prehistoric/ San Lius Rey Complex/Luiseño Period

The San Dieguito Complex consists of a pre-millingstone cultural tradition with artifacts that include leaf-shaped lithic knives, foliate to ovoid bifaces, foliate and short-bladed shouldered points, crescents, choppers, core hammers, and a variety of scrapers. The lack of ground stone artifacts suggests a greater emphasis on big-game hunting than hard seed processing.

The Puama Complex/Encinitas Tradition represents a diversification in the resource base. Assemblages represent a seed-grinding, small-game-hunting, shellfish-collecting culture as contrasted with the non-millingstone San Dieguito Complex. Artifacts include a large number of basined millingstones, unshaped manos, a preponderance of flaked cobble tools, Pinto-like projectile points, and, occasionally, perforated stones. Burials tend to be flexed, with heads to the north, under stone cairns.

Finally, the San Luis Rey Complex and Luiseño Period, or Late Prehistoric Period, represents a cultural tradition directly correlated with specific Hokan-speaking groups and shift to intensified acorn processing technology and diversification of the resource base. Features and artifacts from this period include cremations, bedrock mortars, millingstones, Western Triangular Cluster projectile points (Justice, 2002), bone awls, pottery vessels, stone and shell ornaments, and a proliferation of red and black pictographs. Protohistoric components of this complex include such non-aboriginal items as metal knives and glass beads.

Ethnography

Barstow Site Vicinity

At the time of Euroamerican contact, the Barstow area was occupied by the Vanyume. Given the harsh, arid territory they inhabited, the Vanyume were few in number and relatively impoverished relative to other southern California groups. Occupying the northern reaches of the Mojave River, their neighbors included the Serrano to the south and the Kawaiisu to the northwest. While some observers in the past have grouped the Vanyume within the Serrano group, Kroeber (1925:614) concludes that they represent a distinct, politically autonomous population related to other regional groups, such as the Serrano, Cupeño, Cahuilla, and Kitanemuk, by trade, proximity, and interintelligible language. The aforementioned groups all belong to the Takic language family (Bean and Smith, 1978:570). The Vanyume were also distinguished from neighboring Serrano groups by their amicable relations with the Mohave and Chemehuevi, who were generally hostile towards the Serrano (Kroeber 1925:614).

Few primary sources for the Vanyume exist in the literature, primarily as a result of the rapid and near complete decimation of the group between 1820 and 1834, when they were sent to missions and *asistencias* by Spanish missionaries. Additional information on the Vanyume and their neighbors can be found in Benadict (1924 and 1926), Kroeber (1925), Strong (1929), and Drucker (1937).

While very little has been written concerning the nature of Vanyume settlement and subsistence patterns, their general adaptive strategies would have been severely limited by their extreme environs and were likely analogous to that of other Mojave Desert dwellers. Remarking on the observations made by a Franciscan missionary in the latter half of the 18th century, Kroeber notes, “At the lowest village [Father Francisco] Garcés found some bean and screw mesquite trees and grapevines; but the inhabitants had nothing but tule roots to eat. They were naked, and a cold rain prevented their going hunting; but they possessed blankets of rabbit and otter fur. Their snares were made of wild hemp. At one of the upper villages there were small game and acorn porridge...(Kroeber, 1925:615).” We may surmise, based on the resources available in their territory, that their diet included deer, mountain sheep, rabbit, waterfowl, acorns, mesquite, piñon nuts, and the fleshy bulbs of a variety of cacti.

Los Coyotes Site Vicinity

The Los Coyotes Reservation is located within territory that was occupied by the Cupeño-speaking Native Americans at their border with the mountain Cahuilla (Bean and Smith, 1978:588;). Being one of the smallest linguistic groups in southern California, the Cupeño occupied an approximately 10-mile area that included the mountains at the headwaters of the San Luis Rey River and encompassed the broad open valley of San Jose de Valle. The Cahuilla, their neighbors to the north, east, and south, occupied the

valleys, passes, deserts, and mountains from San Bernardino to the Salton Sea. Both the Cupeño and Cahuilla language belong to the Cupan subgroup of the Takic family of Uto-Aztecan. Prior to 1902 the Cupeño occupied two permanent villages, *Kupa*, at the base of Hot Springs Mountain, and *Wilakalpa* (Bean and Smith, 1978:588). Although united by marriage, trade, and social intercourse, the two villages were politically independent.

The basic social unit of the Cupeño was the village community, or “tribelet” (Kroeber, 1925). Tribelets were organized by clan and were autonomous from each other. Dialects might encompass several tribelets and territories outside the village community were vaguely defined. The immediate area surrounding a village was owned in common by the headman’s lineage. Clans were bound by social, religious, and territorial ties, but each maintained its distinctiveness, had its own gathering areas, and had its own leader.

Villages were often located near major drainages, inhabited mainly in the winter as it was necessary to go out into the higher elevations or west to the coast to establish temporary camps during food gathering seasons (i.e. spring, summer, and fall). Villages typically consisted of several conical, partially subterranean thatched houses, numbering from four or five to several dozen in larger villages, each house containing a single family of three to seven people. Round, semisubterranean, earth-covered sweathouses were important for purification and curing rituals. A ceremonial structure, the *wamkis*, was in a centrally located area within the village that was enclosed by circular fencing (Bean, 1978:578).

The Cupeño economy was based on fishing, hunting, and gathering, with tribelet members moving to various places within their territory to take full advantage of different resources as they became available (Bean and Smith, 1978:578). Game, such as deer, rabbit, and waterfowl, was hunted either by the individual or in community drives. Also, the diversity of habitat produced a floral domain of great variety consisting of, among others, acorns, mesquite, piñon nuts, and the fleshy bulbs of a variety of cacti. Six varieties of acorns represented one of the most important staples of Cupeño subsistence and were particularly abundant within oak woodlands in interior valleys. Fire was used as a crop-management technique, as well as for communal rabbit drives. Some Cupeño tribelets defended their territory against trespassers, but land outside the village community was not considered privately owned (Bean and Smith, 1978). Individual material possessions were usually destroyed upon the death of an individual, so that the individual’s spirit could take it all to the spirit world.

Historical Context

Barstow Site Vicinity

The first Euroamerican travel through the Barstow area occurred in 1776 with the Spanish Franciscan priest, Francisco Garces. His party was in search of a practical travel and trading route from southern Arizona and New Mexico to the missions in California (Hoover *et al.*, 1990:304). By 1847, most of the Euroamerican traffic occurred over the “Old Spanish Trail,” which forked northward from the Mojave Road just a few miles east of the modern town of Barstow. The early travelers were a mix of mission escapees, merchants, explorers, trappers, raiders, and immigrants.

In the early 1860s, Euroamerican pioneers began settling along the Mojave River, deriving a living from the road traffic. They established way stations and ranches that provided travelers with the necessary supplies to make the difficult journey and protection from Indian hostilities. Even after the American occupation, raids on travelers by Indians and white raiders continued. One of the reasons settlement was deliberately encouraged in this area was the desire to discourage raiders from attacking the more densely inhabited areas (Hoover *et al.*, 1990:30).

Though gold mining began in the early 1850s at the south end of Death Valley, large local developments did not start until the 1880s. The costly freight charges, crude mineral recovery methods, scarcity of water, and lack of local subsistence all conspired to delay significant development. However, in 1881 rich silver deposits were discovered and gave birth to the Daggett Mills, and Calico and Waterman mines. The wealth of these mines brought 3,500 people to the area, and Calico became one of the most prosperous camps of the great Southwest. Later, a dramatic drop in the price of silver led to the collapse of the silver boom and the virtual abandonment of the area (Hoover *et al.*, 1990:314; City of Barstow, 2006a).

In 1853, shortly after the admission of California to the Union, the U.S. Congress authorized a program of exploration and surveys of the Southwest in anticipation of a railroad route from the Mississippi River to the Pacific Ocean. The desert portion of this route was finally built by Southern Pacific in 1883 when it completed the line from Mojave to Needles (Hoover *et al.*, 1990:307; City of Barstow, 2006a).

San Bernardino County was organized in 1853 from territory that was at first part of Los Angeles and San Diego counties. The name comes from the Spanish for Saint Bernardine of Siena. The city of San Bernardino has always been the county seat (Gudde, 1990:330; Hoover *et al.*, 1990:304).

In 1886, the California Southern, a subsidiary of the Atchison, Topeka & Santa Fe Railway Co., completed its line from National City near San Diego through the Cajon Pass to join the transcontinental line. The junction of the two lines, first known as Waterman Junction after the California Governor, was changed to Barstow in honor of William Barstow Strong, the Santa Fe Railway Co. president. Barstow's first building was a hotel-depot located on the south bank of the Mojave River (Gudde, 1990:27; City of Barstow, 2006a). Santa Fe became the main transportation link and employer within Barstow and the surrounding desert communities.

Barstow, like many of the surrounding desert communities, was slow to grow in its initial years. Originally located north of the railroad tracks, Barstow moved south and uphill in the mid 1920s as Santa Fe repeatedly expanded its rail facilities. Later, as the state highway system started to develop, local businessmen lobbied officials to locate the intersection of Routes 66 and 91 near First Street, resulting in the construction of a huge overpass above the Santa Fe rail yards and the Mojave River bridge built in 1930 (City of Barstow, 2006a). As a result of continued rail developments, employment and services, Santa Fe was indirectly responsible for the present highway locations and the manner in which they converge in Barstow, as well as the later establishment of nearby military reservations in the 1940s. On September 30, 1947, Barstow was incorporated as a city.

Los Coyotes Site Vicinity

When the Spaniards first visited the nearby area of Agua Caliente, west of the project area, they found a large Cahuilla Indian Rancheria there. All the land surrounding the springs, later called Warner's Springs, including Los Coyotes Reservation, about 49,000 acres in all, later came under the joint control of Missions San Diego and San Luis Rey. These lands stayed in their possession until secularization and the subsequent confiscation of mission property in 1836 (Hoover *et al.*, 1990:326). In 1844, Jonathan Trumbull Warner, an immigrant from Connecticut, laid claim to the land and became one of the first Americans to become an extensive landholder in California. The estate he built became a major stop for travelers along the Immigrant Trail. Warner Springs was to the south what Sutter's Fort was to the north. Cattle ranching dominated other agricultural activities and the development of the hide and tallow trade with the United States increased during the early part of this period. The Pueblo of San Diego was well established during this period and Native American influence and control greatly declined. The Mexican period ended when Mexico ceded California to the United States after the Mexican-American War of 1846-48.

Soon after American control was established, gold was discovered in California, which triggered a tremendous influx of Euroamericans that effectively ended much of the Spanish and Mexican cultural influence and eliminated what control Native Americans had retained. Few Mexican Ranchos remained intact because of land claim disputes. The homestead system also increased American settlement beyond the coastal plain.

Native Americans who lived in the former village of Kupa, within Warner's Ranch, were forcibly relocated to the Pala Reservation in 1902. The Los Coyotes Reservation was established in 1900 by an Act of Congress, and expanded to include Cleveland National Forest land by an Executive Order in 1914. Today this reservation is home to primarily Cahuilla people (California Dept. of Housing and Community Development, 1996).

3.5.2 REGULATORY FRAMEWORK

National Register of Historic Places Eligibility

The National Historic Preservation Act of 1966 (as amended through 2000) authorizes the National Register of Historic Places (NRHP), a program for the preservation of historic properties ("cultural resources") throughout the Nation. The eligibility of a resource for NRHP listing is determined by evaluating the resource using criteria defined in 36 C.F.R § 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.

Unless a site is of exceptional importance, it is not eligible for listing in the NRHP until 50 years after it was constructed.

All properties change over time. Therefore, it is not necessary for a property to retain all its historic physical features or characteristics in order to be eligible for listing on the NRHP. The property must, however, retain enough integrity to enable it to convey its historic identity; in other words, to be recognizable to a historical contemporary. The NRHP recognizes seven aspects or qualities that, in various combinations, define integrity:

1. **Location** – the place where the historic property was constructed or the place where the historic event occurred.
2. **Design** – the combination of elements that create the form, plan, space, structure, and style of a property.
3. **Setting** – the physical environment of a historic property.
4. **Materials** – the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.
5. **Workmanship** – the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.
6. **Feeling** – a property’s expression of the aesthetic or historic sense of a particular period of time.
7. **Association** – the direct link between an important historic event or person and a historic property (National Park Service 1990).

To retain historic integrity a property will always possess several, and usually most, of these aspects. In order to properly assess integrity, however, significance (why, where, and when a property is important) must first be fully established. Therefore, the issues of significance and integrity must always be considered together when evaluating a historic property.

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 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.

Based upon the findings of the cultural resources technical reports, the Lead Agency (Bureau of Indian Affairs (BIA)) makes a determination identified as a Finding of Effect. This determination is then forwarded to the State Historic Preservation Officer for concurrence. Given the fact that no cultural

resources were identified within the project site, the BIA would reach a finding of No Historic Properties Effected. Upon SHPO concurrence with this finding the Section 106 process would be concluded.

3.5.3 PREHISTORIC AND HISTORIC RESOURCES – BARSTOW SITE

Records and Literature Search

Methodology

Prior to the field study, a records search was conducted at the San Bernardino Archaeological Information Center (SBIC) of the California Historical Resources Information System, which is housed at the San Bernardino County Museum, San Bernardino, California. The SBIC, an affiliate of the State of California Office of Historic Preservation (OHP), is the official State repository of archaeological and historical records and reports for San Bernardino County. Additional research was conducted using the resources on file at the AES Sacramento office.

The records search and literature review for this study were done (1) to determine whether known cultural resources had been recorded within or adjacent to the study area; (2) to determine whether known resources have been reported in archaeological, ethnographic, and historical documents and literature; and (3) to assess the likelihood of unrecorded cultural resources based on the distribution of nearby archaeological sites in relation to their environmental setting.

Included in the review were the following inventory and databases: *California Inventory of Historical Resources* (OHP, 1976), *Five Views: An Ethnic Historic Site Survey for California* (OHP, 1988), *California Historical Landmarks* (OHP, 1990), *California Points of Historical Interest* (OHP, 1992), *Historic Properties Directory Listing for San Bernardino County* (OHP, 2006a), and the *National Register of Historic Places Index of Listed Properties* (NPS computer listing for February 2006). The *Historic Properties Directory* includes the National Register of Historic Places and the California Register of Historical Resources, and the most recent listings of the California Historical Landmarks and California Points of Historical Interest (through February 8, 2005) not found in the published versions.

Results

The records search found that no recorded prehistoric or historic cultural resources are located within the Barstow project site. Two cultural resources studies conducted within portions of the project site were identified. In 1980, a linear survey was conducted for the Bureau of Land Management that included the western portion of the project site. This survey resulted in the recording of 27 prehistoric resources and 3 historic-period resources. None of these were located on the Barstow project site (Sutton 1980). Far Western Anthropological Research Group also conducted a linear survey as part of a gas pipeline alignment that ran through the western portion of the project site. They recorded an isolated cryptocrystalline flake (P-36-0061) just outside the southwestern boundary of the project area. However, no cultural resources were identified within the portion of the survey that included the Barstow project site (McGuire and Glover 1991).

In addition to the two studies mentioned above, three other cultural resources studies have been conducted within 0.5 miles. An extensive linear survey was conducted as part of a proposed Mojave pipeline

corridor from Arizona to California that ran along the northern boundary of the project site (McGuire 1990). LSA Associates conducted a linear survey of the Lenwood Road extension that runs from Barstow past the western portion of the project site (Rosenthal and Padon, 1993). A series of parcels totaling 32 acres located 0.25 miles southwest of the project site was also surveyed (Parr 1996). None of these three studies identified any cultural resources adjacent to or within one-half mile of the project area.

One prehistoric archaeological site (CA-SBR-2289) has been recorded within one-half mile of the project site. This site consists of a lithic scatter containing chalcedony flakes, a scraper, and bifacial foliates (Stricler, 1970). No other archaeological sites have been recorded within a 0.5-mile radius of the project site.

Historic maps of the project area were consulted to identify any structures that were in the project area or evidence of past land uses. The 1931 GLO Plat and 1934 USGS Barstow depict a structure possibly in the northwest corner of the project site. The 1934 map also depicts a road bisecting the project site on a north-south axis.

Native American Heritage Commission Consultation

On March 27, 2006, the State of California Native American Heritage Commission (NAHC) was asked to review the Sacred Lands file for information on Native American cultural resources in the study area (**Appendix G**). On April 21, 2006, the NAHC responded indicating it has no knowledge of Native American sacred sites within the Area of Potential Effects (APE). However, the NAHC did provide a list of Native American individuals and groups for further consultation. Consultation letters were sent to these groups and individuals on May 15, 2006, and again on October 18, 2006. Follow-up phone calls were conducted with these individuals and groups during June 2006. To date, no response has been received from any of the individuals or groups contacted. Copies of correspondence are included in **Appendix G**.

Field Survey

Methodology

An M.A.-level archaeologist conducted an intensive-level pedestrian survey of the 23.1-acre Barstow site on May 3 and 4, 2006 (AES, 2009a). The survey consisted of 15-meter-wide linear transects in an east-west direction throughout the project site. Surface visibility was considered excellent (90 percent) as the ground was only sparsely vegetated with creosote brush scrub. Cut banks along seasonal drainages and washes in the project site were examined for soil profiles and buried deposits. Numerous rodent burrow backdirt piles, off-road trails, and road cuts were examined for indicators of buried archaeological deposits.

Results

No prehistoric or historic-period cultural resources were identified as a result of the survey. The remains of a former structure located near the far northeastern portion of the property were observed and found to be outside the project site of Alternative A and B. The remains include a housepad, concrete and asphalt fragments, a graded driveway, various structural debris, and several non-native ornamental trees. None of

these remains (ferrous metal, plastics, modern window glass, electrical wire) suggest any antiquity, and the trees were identified as being no more than 10 to 15 years old.

3.5.4 PALEONTOLOGICAL RESOURCES – BARSTOW SITE

Typologies and Formation Processes

The processes involved in the preservation of paleontological resources result in several types of remains. Factors affecting the persistence of paleontological resources vary between species, and broadly include geological formation processes (**Section 3.2**), climate, soil and rock chemistry, and organism morphology. Paleontological resources are discussed here as fossil remains, although other types of remains occur elsewhere.

Fossils are the remains of plants and animals embedded in layers of rock, which have retained some degree of their original characteristics over a long period of time. Remains are buried under layers of sediment, which under building pressure become sedimentary rock. Paleontological remains can be those of organism structure, such as skeletal parts, shell, tree trunks, pollen, endocasts or imprints, or they can be remnants of activity, such as footprints or tunnels of burrowing organisms. Soft tissues are less frequently fossilized, because they usually decay before fossilization processes take place. Since fossil remains occur in sedimentary rock formations, they tend to persist unless the rock has undergone significant changes. Fossils do not occur in metamorphic rock formations.

Fossils of considerable age may be subject to varying degrees of mineralization, at times resulting in the total replacement of original, organic matter by minerals. The agents of mineralization are most commonly composed of calcium carbonates such as calcite and aragonite, and silicates such as quartz, opal and chalcedony. Less common materials are iron disulfides such as pyrite and marcasite; limonite; sulphates, such as gypsum; phosphates, such as calcium phosphate and vivianite; and glauconite. These minerals are typically transported in minute quantities by seeping water, with aggregation over time.

Regional Characteristics

As noted in **Section 3.2**, the USGS and the California Division of Mines and Geology describe the geological profile of the Barstow site and vicinity as being comprised of lake and playa alluvium and terrace deposits, mostly non-marine in origin, and both unconsolidated and semi-consolidated; and Pliocene and/or Pleistocene sandstone, shale and gravel, loosely consolidated.

Database Search

The online database at the University of California Museum of Paleontology was consulted on April 12, 2006. While no records of paleontological finds exist on the Barstow site, three noteworthy specimen records within 13 miles of the site were found. In the uplands approximately 13 miles north of the Barstow site, a mammal specimen from the Miocene epoch was reported. Meanwhile, a record was found for Pleistocene mammal specimens approximately 10 miles southwest of the site. Additionally, a record of an unspecified invertebrate specimen was found associated with the highlands approximately seven miles southeast of the Barstow site.

Potential for Fossil Discovery

No records exist to indicate the presence of known paleontological resources on the Barstow site. Based upon the association of Pleistocene mammal specimens with elevations and geological environments similar to those of the Barstow site, a slight potential exists for subsurface deposits of Pleistocene mammals to be present.

Results

No Paleontological resources were identified as a result of the field survey of the Barstow site.

3.5.5 PREHISTORIC AND HISTORIC RESOURCES – LOS COYOTES RESERVATION

Records and Literature Search

Methodology

A records search was conducted at the South Coast Information Center (SCIC) of the California Historical Resources Information System, which is housed at San Diego State University, San Diego, California. The SCIC, an affiliate of the State of California Office of Historic Preservation (OHP), is the official State repository of archaeological and historical records and reports for San Diego County. Additional research was conducted using the resources on file at the AES Sacramento office.

The records search and literature review for this study were done (1) to determine whether known cultural resources had been recorded within or adjacent to the study area; (2) to determine whether known resources have been reported in archaeological, ethnographic, and historical documents and literature; and (3) to assess the likelihood of unrecorded cultural resources based on the distribution of nearby archaeological sites in relation to their environmental setting.

Included in the review were the following inventory and databases: *California Inventory of Historical Resources* (OHP, 1976), *Five Views: An Ethnic Historic Site Survey for California* (OHP, 1988), *California Historical Landmarks* (OHP, 1990), *California Points of Historical Interest* (OHP, 1992), *Historic Properties Directory Listing for San Diego County* (OHP, 2006b), and the *National Register of Historic Places Index of Listed Properties* (NPS computer listing for February 2006). The *Historic Properties Directory* includes the National Register of Historic Places and the California Register of Historical Resources, and the most recent listings of the California Historical Landmarks and California Points of Historical Interest (through February 8, 2005) not found in the published versions.

Results

The review found that no prehistoric or historic-period cultural resources have been recorded within the APE; however, five prehistoric sites and one historic-period cultural resource have been recorded within the radius of the records search. The prehistoric sites consist of bedrock mortar outcrops that have habitation debris associated with them. The historic-period resource consists of a rock and cement mortar water reservoir with a wooden frame roof (Pigniolo and Dieter, 2000).

The review also found that portions of the APE have been previously studied for cultural resources. In 2002, Tierra Environmental Services (Pigniolo *et al.*, 2002) conducted a survey as part of a campground hazardous fuel reduction project that included approximately 70 percent of the northern portion of the APE. Though seven cultural resources were identified as part of the study, none were located within the present APE. A linear survey has also been conducted of Los Coyotes Road (Pigniolo and Baksh, 2002) that is included in the western portion of the APE as part of a road improvement project. Though several resources were identified along the road, none were located within the present APE.

Native American Heritage Commission Consultation

On March 27, 2006, the State of California NAHC was asked to review the Sacred Lands file for information on Native American cultural resources in the study area (**Appendix G**). The NAHC responded on April 27, 2006 indicating they had no knowledge of Native American sacred sites within or adjacent to the project site. However, they did provide a list of Native American individuals and groups for further consultation. On May 24, 2006 consultation letters were sent to these individuals and groups. Follow-up phone calls were conducted with these individuals and groups during June 2006. Two response letters were received by AES and are included with copies of all consultation correspondence in **Appendix G**.

Field Survey

Methodology

An M.A.-level archaeologist conducted an intensive pedestrian survey of the 19-acre project site on May 2, 2006 (AES, 2009b). The survey consisted of 15-meter-wide linear transects in a north-south direction throughout the project site. Surface visibility was considered good (70 percent) as the ground was thinly vegetated and soils were exposed. Cut banks along San Ysidro Creek, a semi-permanent drainage, were examined for soil profiles and buried deposits. Numerous rodent burrow backdirt piles, off road trails, and road cuts were examined for indicators of buried archaeological deposits.

Results

No prehistoric or historic-period cultural resources were identified as a result of the survey. The remains of a former campground located northeast of the project site were observed. These included several cinderblock outhouses, picnic tables, and portable latrines. None of these features appear to be of significant antiquity and are considered modern.

3.5.6 PALEONTOLOGICAL RESOURCES – LOS COYOTES RESERVATION

Regional Characteristics

As noted in **Section 3.2**, the California Division of Mines and Geology (CDMG) describes the region including the Los Coyotes site as comprised of a geological formation process, which began in the Jurassic and Late Cretaceous eras, wherein a series of volcanic islands off the coastline of today's San Diego region were associated with the formation of a granitic and gabbroic batholith beneath the region. Geological formations of this type are known to contain several varieties of paleontological resources.

Database Search

The online database at the University of California Museum of Paleontology was consulted on April 19, 2006. No records were found for specimens within 20 miles or less of the Los Coyotes site. The nearest recorded specimen was an unspecified Pliocene vertebrate at a locality known as Coyote Creek, approximately 23 miles northeast of the Los Coyotes site.

Potential for Fossil Discovery

No records exist to indicate the presence of known paleontological resources on the Los Coyotes site. Based upon the association of Pleistocene mammal specimens with elevations and geological environments similar to the Los Coyotes site, a slight potential exists for subsurface deposits of Pleistocene mammals to be present.

Results

No Paleontological resources were identified as a result of the field survey of the Los Coyotes site.

3.6 SOCIOECONOMIC CONDITIONS AND ENVIRONMENTAL JUSTICE

This section addresses the existing socioeconomic conditions of the Barstow and Los Coyotes sites and surrounding regions. The general and site specific profiles of socioeconomic conditions described in this chapter provide the environmental baseline by which direct, indirect, and cumulative environmental effects are identified and measured in **Chapter 4.0**.

3.6.1 SOCIOECONOMIC CHARACTERISTICS OF SAN BERNARDINO COUNTY (BARSTOW SITE)

Population

Regional

As shown in **Table 3.6-1**, the population of San Bernardino County as of January 1, 2010 was approximately 2,073,149 people. The majority of the regional population resides in the southwest portion of San Bernardino County within proximity to Los Angeles. San Bernardino County has an incorporated population of approximately 1,776,865 people and an unincorporated population of approximately 296,284 people. The 2010 population of the City of Barstow was approximately 24,281 or 1.2 percent of San Bernardino County's total population. The closest city, Victorville, is approximately 25 miles southwest, and the City of San Bernardino is approximately 65 miles southwest.

TABLE 3.6-1
BARSTOW SITE REGIONAL POPULATION

Location	Population		
	2000	2005	2010
State of California	33,873,086	36,676,931	38,648,090
San Bernardino County	1,710,139	1,945,835	2,073,149
Unincorporated County	292,857	302,121	296,284
City of Barstow	21,119	23,646	24,281
Source: California Department of Finance, 2010.			

Population Trends

The population of San Bernardino County grew from 1,710,139 people in 2000 to 1,945,835 people in 2005, an increase of approximately 13.8 percent. Between 2005 and 2010, San Bernardino County's population has expanded to approximately 2,073,149 people, an increase of about 6.5 percent. From 2000 to 2005, the unincorporated population of San Bernardino County increased by approximately 3.2 percent. From 2005 to 2010, the unincorporated population decreased by 1.9 percent to approximately 296,284 people. The population of Barstow increased by 11.9 percent from 21,119 residents in 2000 to 23,646 in 2005. Between 2005 and 2010 Barstow saw a population increase of approximately 635 residents, or 2.7 percent. Overall, the state has experienced approximately 14 percent growth since 2000; whereas San Bernardino County has experienced an approximately 21 percent growth.

Housing

In January 2010, California was estimated to have approximately 13,591,866 housing units, of which approximately 801,723 or 5.90 percent were vacant. In the same month, compared to the State of California, San Bernardino County had roughly twice the percentage of vacant units, and Barstow had almost three times the percentage of vacant units. As shown in **Table 3.6-2**, in January 2010 there were estimated to be 693,712 housing units in San Bernardino County, of which 11.58 percent were vacant (DOF, 2010). The unincorporated areas of San Bernardino County were estimated to have 130,266 units, of which 28.31 percent were vacant. Barstow had 10,160 housing units, of which 17.10 percent were vacant. Between 2000 and 2010, both the City of Barstow and the County experienced steady housing growth. Based on the information presented in **Table 3.6-2**, it was determined that the total number of housing units increases annually by approximately 1.45 percent, while the percentage of vacant units tends to decrease annually by approximately 0.2 percent.

TABLE 3.6-2
BARSTOW SITE REGIONAL HOUSING

Location	2000		2005		2010	
	Total Units	% Vacant	Total Units	% Vacant	Total Units	% Vacant
State of California	12,214,550	5.83	12,941,231	5.85	13,591,866	5.90
San Bernardino County	601,369	12.10	645,394	11.74	693,712	11.58
Unincorporated County	126,863	28.03	128,279	27.55	130,266	28.31
City of Barstow	9,153	16.45	9,756	16.78	10,160	17.10

Source: California Department of Finance, 2010.

Employment

As shown in **Table 3.6-3**, San Bernardino County had approximately 870,800 people in its labor force and a 14.8 percent unemployment rate in March 2010. Barstow had approximately 10,800 people in its labor force and an 18.3 percent unemployment rate in March 2010. The labor force is generally defined as employed workers and unemployed workers actively looking for work. Compared to San Bernardino County unemployment rates, Barstow was 3.5 percent higher in March 2010; and compared to State unemployment rates, Barstow was 5.3 percent higher in March 2010.

In 2009, San Bernardino County had a labor force of 864,290 people, of which 13.0 percent (112,660 people) of the labor force was unemployed (Bureau of Labor Statistics, 2009). In 2009, the U.S. unemployment rate averaged 9.3 percent; lower than the unemployment rate in San Bernardino County. Since 2000, the labor force in San Bernardino County has increased by an average rate of 1.5 percent each year. According to the Council of Economic Advisers, it is projected that the U.S. will observe an approximate 6.5 percent unemployment rate in 2014 (Council of Economic Advisers, 2010).

The largest industries in Barstow, which account for approximately 68 percent of the labor force, are: retail trade; transportation, warehousing, and utilities; educational, health, and social services; arts,

entertainment, recreation, accommodation, and food services, and public administration (U.S. Census Bureau, 2000).

TABLE 3.6-3
BARSTOW SITE REGIONAL LABOR FORCE ESTIMATES (MARCH 2010)

Location	Labor Force	Unemployed	Unemployment Rate
State of California	18,317,000	2,381,000	13.0
San Bernardino County	870,800	128,900	14.8
City of Barstow	10,800	2,000	18.3
Notes: Not Seasonally Adjusted. Source: EDD, 2010.			

Income

The median household income of San Bernardino County in 2008 was \$54,768 (U.S. Census Bureau, 2008). Barstow had a median household income less than the County at \$35,069 in 1999, which is the most current data available for Barstow as of June 2010 (U.S. Census Bureau, 2000). The median household income of San Bernardino County was 10.2 percent below the median household income for California, which was \$61,017 in 2008 (U.S. Census Bureau, 2008).

Property Taxes

The Barstow site is located on the four San Bernardino County tax parcels 0428-171-66, 0428-171-67, and 0428-171-68. The San Bernardino County Assessor’s office has records of the value of each parcel in 2010. From these records, the total appraised value for all three parcels in 2010 was \$550,731, and the total property tax value for all three parcels in 2010 was approximately \$6,634 (San Bernardino County, 2011). A portion of the property taxes collected by the County are distributed to local districts and the City of Barstow to fund public services.

Crime

Table 3.6-4 shows crimes reported by the Barstow Police Department (BPD) compared to California including robbery, aggravated assault, murder, forcible rape, burglary, larceny, and motor vehicle theft in 2005, which represents the most recent data available.

TABLE 3.6-4
BARSTOW 2005 CRIME RATE PER 100,000 PEOPLE

Area	Population Coverage	Robbery	Aggravated Assault	Murder	Forcible Rape	Burglary	Larceny	Motor Vehicle Theft
Barstow Police Department	23,684	291.3	840.2	4.2	88.7	1,287.8	2,081.6	1,068.2
California	36,132,147	176.1	317.3	6.9	26.0	693.3	1,916.5	712.8
Source: Federal Bureau of Investigation, 2006.								

Crime rates per 100,000 people reported by the BPD in 2005 were higher than California. It is important to note that rates are presented as crimes per 100,000 people for comparison purposes. As shown, the

population covered by the BPD for these statistics is 23,684. Therefore, the actual number of crimes for each category reported by the BPD in 2005 is less than one quarter the number shown. Murder was the only category that had a greater rate of occurrence in California than the BPD. For the remaining categories the rate reported by the BPD was greater than California, but similar larceny rates existed for the two areas. The majority of all crimes reported by the BPD were categorized as larceny. Larceny for these statistics is considered the unlawful taking, carrying, leading, or riding away of property from the possession of another, except for motor vehicle theft (Federal Bureau of Investigation, 2006).

Schools

The Barstow Unified School District (BUSD) serves an area of approximately 330 square miles including the City of Barstow and the communities of Lenwood, Hodge, and Hinkley. The school district consists of eight elementary schools, one intermediate school, two middle/junior high schools, one senior high school, one continuation high school, and one adult school. Enrollment in the BUSD has increased by 0.8 percent over the past decade from 6,720 students in 2000/2001 to 6,774 students in 2008/2009. The average class size in the BUSD has decreased over the past decade from 27.5 in 2000/2001 to 26.0 in 2008/2009, a 5.4 percent decrease. The student to teacher ratio for the 2008/2009 school year, 21.1:1, was slightly greater than that of California (20.9:1) (Ed-Data, 2010). Approximately 57.2 percent of the enrolled students receive free or reduced meals. Developer fees within the City of Barstow contribute to funding for permanent classroom facilities. Other financial burdens of the District due to growth are met primarily through property taxes and tax increment funds from the Redevelopment Agency (City of Barstow, 1997).

Lenwood Elementary School is the closest elementary school to the Barstow site, located approximately three miles to the northwest. Lenwood Elementary School oversees grades K-5. The school has a total enrollment of 330 students and a staff of 19 teachers, resulting in a student to teacher ratio of 17.3:1. Barstow Junior High is the closer of the two middle/junior high schools to the Barstow site, located approximately five miles to the northeast. The school has 973 students enrolled in grades 7-8 and a staff of 42 teachers, resulting in a student to teacher ratio of 23.1:1. Barstow High School, grades 9-12, is located approximately six miles northeast of the Barstow site. The school has a total enrollment of 1,843 students and a staff of 75 teachers, resulting in a student to teacher ratio of 24.9:1

The Barstow Community College District serves 12,000 square miles including the City of Barstow and communities of Yermo, Dagget, Newberry Springs, Hinkley, and Baker. The Barstow College is located at 2700 Barstow Road and is accredited by the California Department of Education and United States Department of Education. Degree programs result in granting of either an Associate in Arts or Associate in Science degree.

3.6.2 SOCIOECONOMIC CHARACTERISTICS OF SAN DIEGO COUNTY (LOS COYOTES SITE)

Population

Regional

San Diego County's January 2010 population was approximately 3,224,432 people (**Table 3.6-5**). The population in unincorporated areas of San Diego County accounted for 15.6 percent of the total county population in 2010. The City of San Diego (excluding contiguous cities), which is located in the southwestern portion of the county, accounted for approximately 42.6 percent of the total population. The Los Coyotes site is located in the northeastern portion of the county, relatively isolated from the substantial metropolitan population of San Diego.

TABLE 3.6-5
LOS COYOTES SITE REGIONAL POPULATION

Location	Population		
	2000	2005	2010
State of California	33,873,086	36,676,931	38,648,090
San Diego County	2,813,833	3,039,424	3,224,432
Unincorporated County	442,832	471,732	503,320
Source: California Department of Finance, 2010.			

Population Trends

The population of San Diego County grew from 2,813,833 in 2000 to 3,039,424 in 2005, an increase of 8.0 percent. Between 2005 and 2010, San Diego County's population increased 6.1 percent to 3,224,432. The unincorporated population of San Diego County grew by 11.1 percent from 2000 to 2005. From 2005 to 2010, the unincorporated population of San Diego County grew by 6.6 percent. The growth rate of San Diego County was marginally less than that of the State from 2000 to 2005, and marginally greater from 2005 to 2010.

Housing

As shown in **Table 3.6-6**, in January 2010 there were 1,154,228 housing units in San Diego County, of which 4.4 percent were vacant. The unincorporated portions of San Diego County were estimated to have 167,104 housing units, of which 6.19 percent were vacant. In 2010 the State was estimated to have 13,591,866 housing units, of which 5.9 percent were vacant. From 2000 to 2010, the percentage of vacant units in San Diego County has been less than the State.

Employment

As shown in **Table 3.6-7**, in March 2010 San Diego County had a labor force of approximately 1,567,700 and an unemployment rate of 11.0 percent. The unemployment rate of San Diego County was less than the State in March 2010, which had an unemployment rate of 13.0 percent.

TABLE 3.6-6
LOS COYOTES SITE REGIONAL HOUSING

Location	2000		2005		2010	
	Total Units	% Vacant	Total Units	% Vacant	Total Units	% Vacant
State of California	12,214,550	5.83	12,941,231	5.85	13,591,866	5.90
San Diego County	1,040,149	4.37	1,105,439	4.42	1,154,228	4.41
Unincorporated County	152,910	5.94	159,277	6.34	167,104	6.19

Source: California Department of Finance, 2010.

TABLE 3.6-7
LOS COYOTES SITE REGIONAL LABOR FORCE (MARCH 2010)

Location	Labor Force	Unemployed	Unemployment Rate (%)
State of California	18,317,000	2,381,000	13.0
San Diego County	1,567,700	172,300	11.0

Notes: Not Seasonally Adjusted.
Source: EDD, 2010.

In 2004 the largest industry in San Diego County, comprising 19 percent of the labor force, was educational services, health care, and social assistance; the next largest, comprising 13 percent of the labor force, was professional, scientific, management, administrative and waste management services; comprising 12 percent was retail trade; comprising ten percent was arts, entertainment, recreation, accommodation, and food services; comprising nine percent was manufacturing; and comprising eight percent was finance, insurance, real estate and rental and leasing.

Income

The median household income of San Diego County in 2008, which represents the most current data available, was \$62,820 (U.S. Census Bureau, 2008), which was slightly higher than the median household income for California, which was \$61,017 in 2008.

Property Taxes

Since the Los Coyotes site is currently tribal land, the land is not subject to property tax payments.

Crime

Table 3.6-8 shows crimes reported by the SDCSD compared to California including robbery, aggravated assault, murder, forcible rape, burglary, larceny, and motor vehicle theft in 2005, which represents the most current data available. Crime rates per 100,000 people reported by the San Diego County Sheriff's Department (SDCSD) in 2005 were lower than California. For each category California reported a greater rate than the SDCSD. The majority of all crimes reported by the SDCSD were categorized as larceny (Federal Bureau of Investigation, 2006).

TABLE 3.6-8
SAN DIEGO COUNTY 2005 CRIME RATE PER 100,000 PEOPLE

Area	Population Coverage	Robbery	Aggravated Assault	Murder	Forcible Rape	Burglary	Larceny	Motor Vehicle Theft
San Diego County Sheriff's Department	457,895	59.0	266.4	2.8	18.8	539.2	1,010.9	455.1
California	36,132,147	176.1	317.3	6.9	26.0	693.3	1,916.5	712.8

Source: Federal Bureau of Investigation, 2006.

Schools

The Warner Unified School District (WUSD) serves an area of approximately 432 square miles in rural northeast San Diego County, including the Santa Ysabel and Los Coyotes Indian Reservation (WUSD, 2010). The WUSD consists of a preschool, an elementary school, a combined middle/high school, and a continuation school. Enrollment in the WUSD has decreased 16 percent over the past decade from 318 in 2000/2001 to 266 in 2008/2009. The average class size in the WUSD decreased by 30 percent over the past decade from 20.3 students in 2000/2001 to 14.2 students in 2008/2009. The 2008/2009 student to teacher ratio (15.3:1) was lower than the State average of 20.9:1 over the same period (Ed-Data, 2010). Approximately 67 percent of Warner Elementary School families qualified for free or reduced-price lunch programs in the 2008/2009 school year, down from 82 percent in the previous year (Ed-Data, 2010).

Warner Elementary School is located approximately 6 miles west of the Reservation. Warner Elementary School oversees grades 1-6. The school had a total enrollment of 99 students and a staff of 5 teachers in the 2008/2009 year, resulting in a student to teacher ratio of 19.8:1. Warner High School is located at the same site as Warner Elementary School. Warner High School oversees grades 6-12. The school had a total 2008/2009 enrollment of 113 students and a staff of 9.9 teachers, resulting in a student to teacher ratio of 11.4:1. The San Jose Valley Continuation High School had two students and 1.2 teachers in 2008/2009 (Ed-Data, 2010).

3.6.3 SOCIOECONOMIC CHARACTERISTICS OF LOS COYOTES TRIBE

Population and Labor

Table 3.6-9 below provides demographic information for the Los Coyotes Tribe from 2006, which represents the most current data available. As shown in **Table 3.6-9**, the Los Coyotes Band of Cahuilla and Cupeño Indians (Los Coyotes Tribe) has a total enrollment of 328 members, of which, approximately 82 members live on the reservation and are included in the Tribal Service Population. Of the Tribal Service Population, approximately 20 members are under the age of 16, approximately 36 members are between the ages of 16 and 64, and approximately one member is age 65 or older. The labor force of the Los Coyotes Tribe consists of 35 members ages 13 and older, of which 50 percent were unemployed and 44 percent were employed, but below the poverty level. Census 2000 data reports a household median income of \$14,167 for the Tribe labor force. Thirteen households were considered low-income, defined by the Tribe as an annual income of less than \$30,000.

Of the 328 Los Coyotes tribal members, approximately 82 live on the Reservation. The majority of the remaining tribal members live in Southern California in San Diego, Riverside, and San Bernardino counties. Those that live on the Reservation reside in the 19 mobile and fixed homes scattered throughout the Reservation. Other development on the Reservation consists of Tribal administration buildings and ancillary facilities. Tribal members are employed at a variety of jobs including six members within the private sector of Warner Springs. School aged children at the Reservation attend both Warner Springs Schools and Nolie High School. The town of Warner Springs is located approximately six miles west of the Reservation. In addition to schools and employment opportunities the town provides the nearest post office, bank, retail stores, and other services.

TABLE 3.6-9
LOS COYOTES TRIBE POPULATION AND LABOR FORCE ESTIMATES

	Total
Tribal Enrollment	328
Tribal Service Population	82
Under age 16	20
Age 16 through 64	36
Age 65 and over	1
Unavailable for work	5
Available for work	35
Employed	16
Employed but Below the Poverty Line	7
Unemployment rate	50%
Source: Los Coyotes Tribe Personal Contact, 2010	

Tribal Government

The Reservation is governed by an Executive Council and a General Council. The Executive Council consists of tribal officers including a Spokesperson, Vice Spokesperson, four at-large council members, and one alternate member. Tribal officers are elected for one-year terms. The General Council consists of all tribal members age 21 and older. For any business, policy, and planning decisions the Executive Council provides advisory services and the final decision is determined by voting in the General Council (Los Coyotes Tribe Personal Contact, 2006).

3.6.4 ENVIRONMENTAL JUSTICE

Regulatory and Policy Framework

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, as amended, 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 Executive Order 12898 and the National Environmental Policy Act (NEPA). The CEQ, in consultation with the U.S. Environmental Protection Agency (USEPA) and other agencies, has developed

guidance to assist federal agencies with their NEPA procedures so that environmental justice concerns are effectively identified and addressed.

According to guidance from the CEQ (1997b) 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. Communities may be considered “minority” under the executive order 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).

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 that is 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 Executive Order 12898.

Communities may be considered “low-income” under the executive order if one of the following characteristics applies:

- The median household income for a Census tract is below the poverty line (primary method of analysis).
- 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.

Affected Environment

To determine whether a proposed action is likely to have disproportionately high and adverse effects on a population, agencies must identify a geographic scale for which they will obtain demographic information. Census tracts are a small, relatively permanent statistical subdivision of a county delineated by a local committee of Census data users for the purpose of presenting data. Census tracts are 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.

Barstow Site Census tracts that were analyzed include Census Tract 118, which contains the Barstow Site, and Census tracts that are adjacent or relatively close to Census Tract 118 but do not cover an expansive area (**Figure 3.6-1**). Los Coyotes site Census tracts that were analyzed include Census Tract 209.03, which contains the Los Coyotes site, and Census tracts that are adjacent or relatively close to Census Tract 209.03 but do not cover an expansive area (**Figure 3.6-2**).

Race

The following races are considered minorities under the executive order:

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

Populations of two or more races were also considered to be a minority race for the purpose of the environmental justice analysis.

Census 2000 data represents the most current racial data available by Census tract. Since the data was reported, the racial composition of the Census tracts is not expected to have changed substantially. Conservative assumptions will be applied to any borderline situations where a minor change in racial composition could affect the minority status of a Census tract. **Tables 3.6-10** and **3.6-11** display the population of each minority race by Census tract in the vicinity of the Barstow and Los Coyotes sites.

TABLE 3.6-10
MINORITY POPULATION – BARSTOW SITE AND REGION

Census Tract	Total 2000 Population	Total Population: Hispanic or Latino	Total population: not Hispanic or Latino; population of one race; Black or African American alone	Total population: not Hispanic or Latino; population of one race; American Indian and Alaska Native alone	Total population: not Hispanic or Latino; population of one race; Asian alone	Total population: not Hispanic or Latino; population of one race; Native Hawaiian and Other Pacific Islander alone	Total population : not Hispanic or Latino; population of one race; some other race alone, other than white	Total population: not Hispanic or Latino; population of two or more races	Total population: minority	Percent minority
94	3,040	1,567	365	54	51	14	10	79	2,140	70%
95	6,819	2,498	651	105	148	37	12	191	3,642	53%
118	6,393	2,006	303	82	79	34	12	134	2,650	41%
119	3,644	921	85	46	48	12	12	83	1,207	33%
120	11,690	3,753	1,467	215	447	147	21	431	6,481	55%

Source: U.S. Census Bureau, 2000.

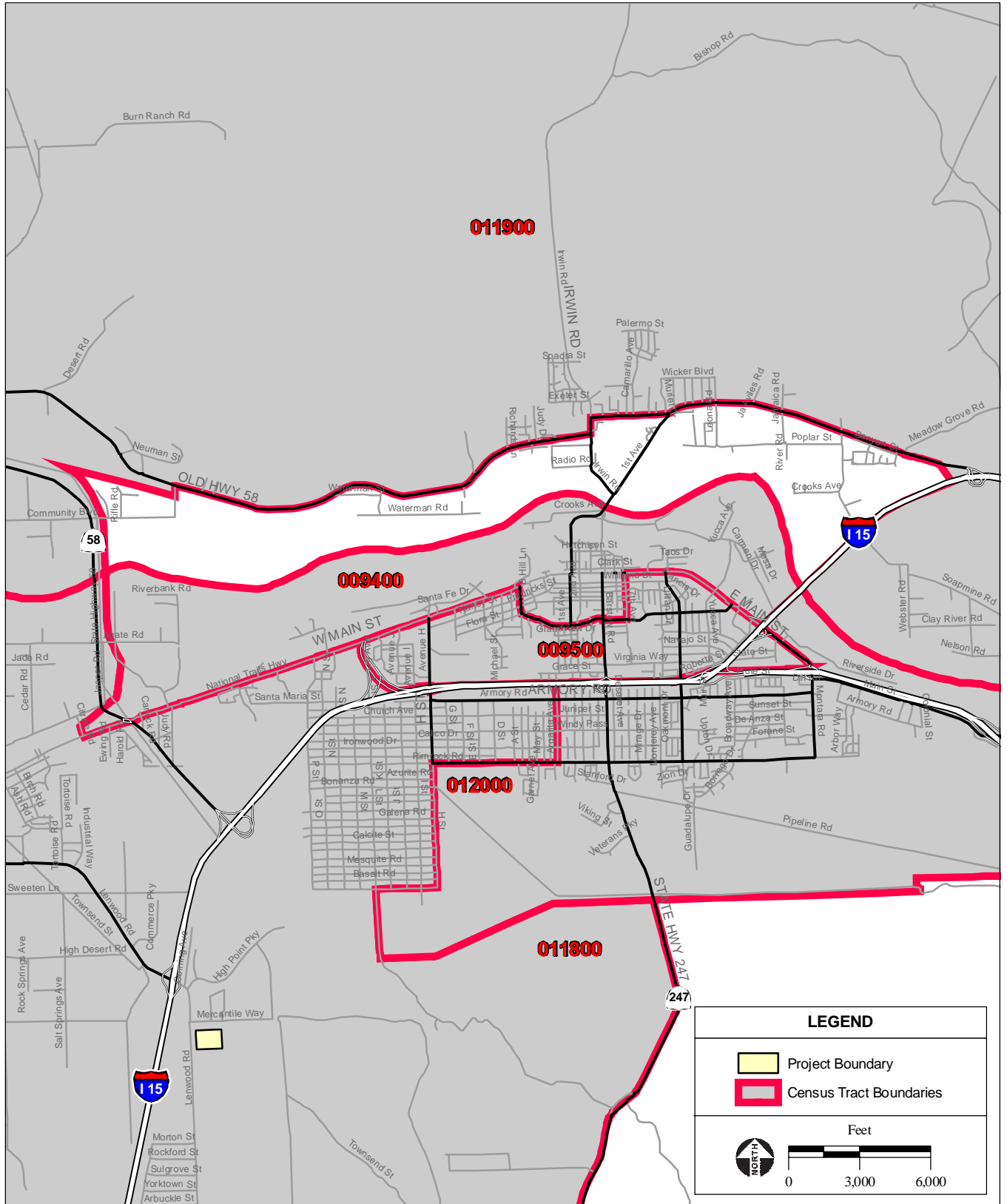
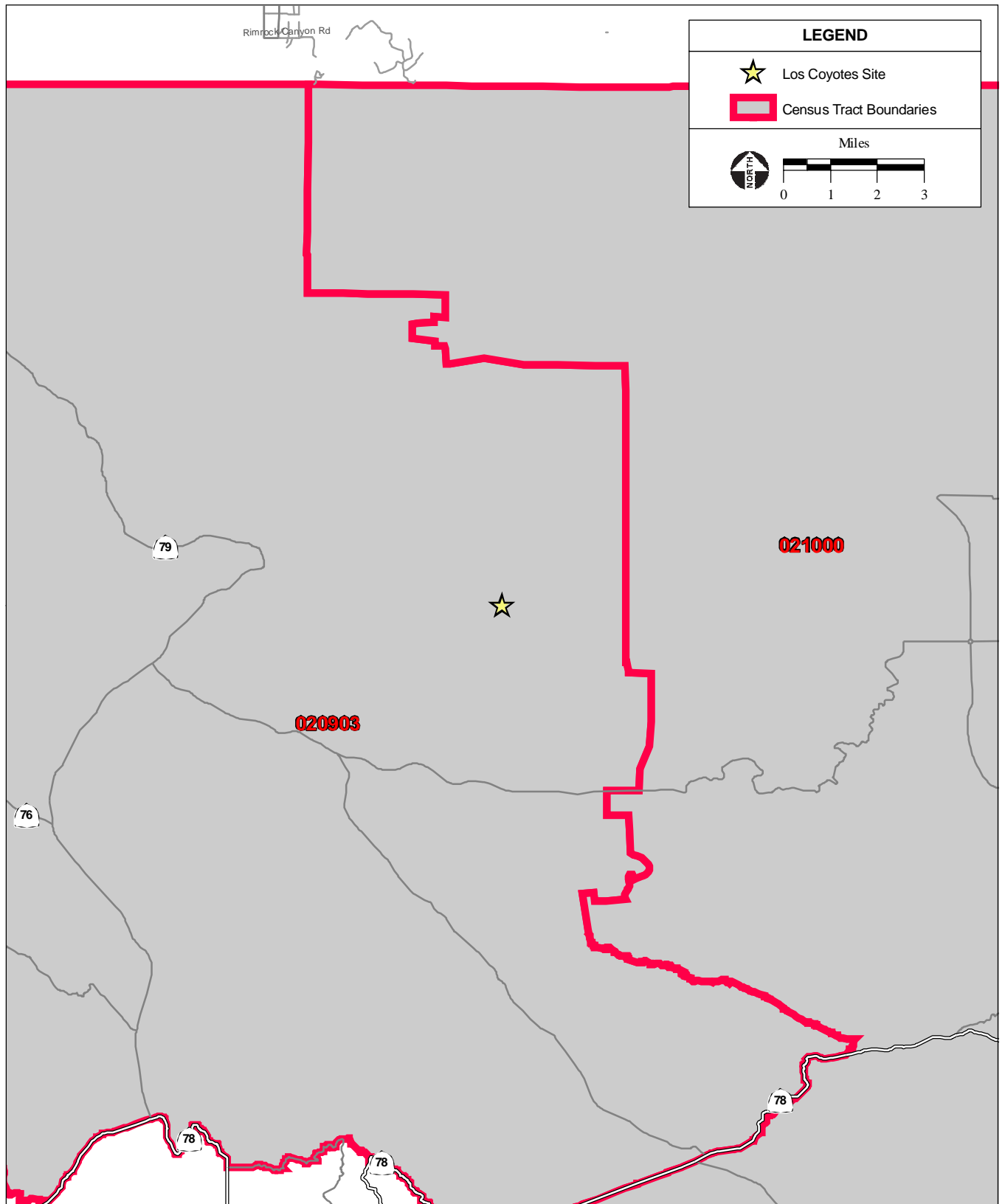


Figure 3.6-1
Barstow Site Census Tracts



SOURCE: ESRI Data, 2006; AES 2009

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Figure 3.6-2
Los Coyotes Site Census Tracts

As shown in **Table 3.6-10**, of the five Census tracts in the vicinity of the Barstow site, Census Tract 94 has a minority population that is equal to roughly 70 percent of the total population; Census Tract 95 has a minority population that is equal to roughly 53 percent of the total population; and Census Tract 120 has a minority population that is equal to roughly 55 percent of the total population. Minority populations in these three Census tracts are above the 50 percent threshold, and therefore are considered minority communities as defined above.

Census Tract 94 is located along the northern portion of Barstow and the Mojave River channel, and to the northeast of the Barstow site. About half of the area is located within the Barstow city limits, and is characterized by predominantly urban areas with some rural and open space area. The total population of the Census tract is 3,040 people, of which 2,140 are considered minorities. Of the minority population 73 percent are Hispanic and Latino, 17 percent are Black or African American, and the remaining 10 percent include the other considered minority populations.

Census Tract 95 is located in the center portion of the Barstow, and to the northeast of the Barstow site. The entire area is located within the Barstow city limits, and is characterized by an urban area. The total population in the Census tract is 6,819 people, of which 3,642 are considered minorities. Of the minority population 69 percent are Hispanic and Latino, 18 percent are Black or African American, and the remaining 13 percent include those that are categorized as “Other.”

Census Tract 120 is located along the southern portion of Barstow, and to the east of the Barstow site. About half of the area is located within the Barstow city limits, and is characterized by predominantly urban areas with some rural and open space area. The total population in the Census tract is 11,690 people, of which 6,481 are considered minorities. Of the minority population 58 percent are Hispanic and Latino, 23 percent are Black or African American, 7 percent are Asian, 7 percent are two or more races, and the remaining 5 percent include those that are categorized as “Other.”

The total minority population in Census Tract 119 is 33 percent of the total population, and in Census Tract 118, which contains the Barstow site, is 41 percent of the total population. The minority population in these Census tracts is below the 50 percent threshold, and therefore is not considered a minority community as defined above.

TABLE 3.6-11
MINORITY POPULATION – LOS COYOTES SITE AND REGION

Census Tract	Total 2000 Population	Total Population : Hispanic or Latino	Total population: not Hispanic or Latino; population of one race; Black or African American alone	Total population: not Hispanic or Latino; population of one race; American Indian and Alaska Native alone	Total population: not Hispanic or Latino; population of one race; Asian alone	Total population: not Hispanic or Latino; population of one race; Native Hawaiian and Other Pacific Islander alone	Total population: not Hispanic or Latino; population of one race; some other race alone, other than white	Total population : not Hispanic or Latino; population of two or more races	Total population : minority	Percent minority
209.03	3,000	413	49	374	36	5	3	43	923	31%
210.00	3,203	980	23	17	12	1	1	24	1,058	33%

Source: U.S. Census Bureau, 2000.

As shown in **Table 3.6-11**, the total minority population of each of the two Census tracts that cover the Los Coyotes site area constitutes slightly greater than 30 percent of overall population. Although the minority population in the Los Coyotes Site area is below the 50 percent threshold, Alternatives C and D would be constructed on Reservation land currently occupied by Tribal members. Therefore, though analysis of Census tract demographics as a whole does not reflect existence of a minority or low-income community, to ensure a conservative analysis the Los Coyotes Band is considered to be a minority and low-income community within the project area under Alternatives C and D (**Table 3.6-9**).

Income

Census 2000 data represents the most current household income data available by Census tract. Income levels reported in Census 2000 represent wages earned in 1999. The use of older income data is expected to result in a conservative estimate of income, given that income levels tend to rise over the years due to inflation. **Tables 3.6-12** and **3.6-13** display the median household income and poverty income limit for each identified Barstow site and Los Coyotes site Census tract. A low-income community is defined as a Census tract where the median household income falls below the poverty limit.

TABLE 3.6-12
HOUSEHOLD INCOME – BARSTOW SITE AND ADJACENT CENSUS TRACTS

Census Tract	Median Household Income (1999)	Average Household Size	Poverty Threshold
City of Barstow	\$35,069	2.7	\$13,290
San Bernardino County	\$42,066	3.2	\$13,290
94	\$15,922	2.5	\$13,290
95	\$35,475	2.7	\$13,290
118	\$44,017	2.9	\$13,290
119	\$39,637	2.8	\$13,290
120	\$39,773	2.8	\$13,290

Source: U.S. Census Bureau, 2000.

TABLE 3.6-13
HOUSEHOLD INCOME – LOS COYOTES SITE AND ADJACENT CENSUS TRACTS

Census Tract	Median Household Income (1999)	Average Household Size	Poverty Threshold
209.03	\$32,321	2.4	\$10,869
210.00	\$35,685	2.2	\$10,869

Source: U.S. Census Bureau, 2000.

As shown in **Table 3.6-12**, the 1999 median household income of each Census tract surveyed in the vicinity of the Barstow site was greater than the poverty threshold. The poverty threshold for each Census tract was determined from the average household size of the Census tract. The poverty threshold assumes average household size is conservatively rounded up to the nearest person (U.S. Census Bureau, 2003b). Since the income level of Census Tract 94 is \$2,632 above the poverty threshold, Census Tract

94 is not considered a low-income community. None of the identified Census tracts have a median household income less than the determined poverty thresholds; therefore, these no low-income communities have been identified in the vicinity of the Barstow site.

Similarly, as shown in **Table 3.6-13**, the 1999 median household income of each Census tract surveyed in the vicinity of the Los Coyotes site was greater than the poverty threshold. Therefore, no low-income communities have been identified in the vicinity of the Los Coyotes site.

Gaming Market

Barstow Site

Development of a casino at the Barstow site would generate revenues, some of which would be diverted from competing gaming facilities. The diversion of revenue from Tribe owned gaming facilities could potentially result in an impact to the owning Tribes of the competing gaming facilities. To determine the potential impacts to Tribes as a result of competition effects, the gaming market for the Barstow site is discussed below. In **Section 4.6** the sources of revenue for a casino at the Barstow site are discussed and any disproportionate impacts to tribes are identified as required by *Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations* (described under the Regulatory Context for Environmental Justice impacts above). It should be noted, that to assess the gaming market and sources of revenue, non-Tribal owned gaming facilities are also considered in the analysis.

The market for a casino at the Barstow site is unique because of the regional population distribution. The potential market for the Barstow site can be divided into two major sources: close-radius residents and long-distance travelers. The close-radius market consists of individuals who reside in areas where Barstow will either be the closest casino or one of the closer casinos. The long-distance market consists of vehicles on Interstate 15 traveling to Las Vegas, as well as travelers that fork onto Interstate 40 east of Barstow going towards Arizona. The primary market opportunity for the Barstow site is the large number of travelers that currently pass through Barstow on I-15 each year.

Table 3.6-14 lists casinos identified within the competitive gaming market of the Barstow site, as described above. The market for the Barstow site includes Primm on the Nevada/California border, California Native American casinos in vicinity of the Barstow site, and casinos on the Arizona/Nevada border near Needles. The nearest gaming facility to the Barstow site is the San Manuel Indian Bingo and Casino located approximately 50 miles southwest. The furthest casino considered within the Barstow site gaming market is the Havasu Landing Casino located approximately 185 miles east

San Manuel Indian Bingo & Casino

The San Manuel Indian Bingo and Casino is located in Highland. This facility consists of 2,000 slot machines, 100 game tables, a 2,500-seat bingo hall, and seven restaurants and bars. The estimated travel time by vehicle from the Barstow site is 72 minutes.

TABLE 3.6-14
BARSTOW SITE LOCAL MARKET CASINOS

Casino Name	Owner	Location	Distance (miles)	Casino Status
San Manuel Indian Bingo & Casino	San Manuel Band of Mission Indians	Highland, CA	50	Open
Morongo Casino Resort Spa	Morongo Band of Mission Indians	Cabazon, CA	100	Open
Whiskey Pete's	Herbst Gaming ¹	Primm, NV	119	Open
Primm Valley Casino Hotel	Herbst Gaming ¹	Primm, NV	119	Open
Buffalo Bill's Resort & Casino	Herbst Gaming ¹	Primm, NV	119	Open
Havasu Landing Casino ²	Chemehuevi Indian Tribe	Havasu Lake, CA	185	Open
Notes: ¹ Owned by a private company rather than Native American Tribe. ² Included in the analysis because of its location off of Interstate 40. The proposed casino at the Barstow location has the potential to capture drive-by patrons on Interstate 40, which could result in competitive effects to this facility. Source: AES, 2010.				

Morongo Casino Resort Spa

The Morongo Casino Resort Spa is located in Cabazon, Riverside County, towards Palm Springs. A \$250 million expansion was completed at the facility in 2004 providing a 27 story four-star hotel, luxury spa and 12,000 square feet of ballroom and meeting space. The facility consists of a 148,000 square foot casino with 2,000 slot machines, 100 game tables, and a 600-seat bingo hall, and ten restaurants and bars. The hotel consists of 272-rooms including 6 villas and 32 suites. The estimated travel time by vehicle from the Barstow site is 99 minutes.

Primm, Nevada

Whiskey Pete's Resort and Casino consists of a 36,400 square foot casino with 1,020 slot machines, 31 gaming tables, and 3 restaurants and bars, as well as a hotel with 777-rooms and 4 suites. Primm Valley Resort and Casino consists of a 46,100 square foot casino with 1,040 slot machines, 38 gaming tables, and 6 restaurants and bars, as well as, a hotel with 624-rooms. Buffalo Bill's Resort and Casino consists of a 46,000 square foot casino with 1,240 slot machines, 38 gaming tables, and 8 restaurants and bars, as well as a hotel with 1,242-rooms and 15 suites. In 2002, the combined realized estimated gross revenues from the three Primm properties were approximately \$209 million. The estimated travel time by vehicle from the Barstow site is 104 minutes.

Havasu Landing Casino

The Havasu Landing Casino consists of a 6,900 square foot casino with 230 slots, 5 gaming tables, and one restaurant. The estimated travel time by vehicle from the Barstow site is 194 minutes.

Los Coyotes Site

The competitive gaming market for a casino at the Los Coyotes site is considered to consist of casinos in proximity to the Los Coyotes site in San Diego County, since patrons could choose from several casinos throughout the County. **Table 3.6-15** lists casinos located in the competitive gaming market of the Los

Coyotes site. Eight casinos were identified in the Los Coyotes market. The nearest gaming facilities to the Los Coyotes site are the Santa Ysabel Casino located approximately 11 miles southwest, the Cahuilla Creek Casino located approximately 25 miles to the north, and Harrah’s Rincon Casino and Resort and Valley View Casino, which are both located 25 miles to the west. The next closest gaming facilities are the Barona Casino, Viejas Casino & Turf Club, and Sycuan Casino located approximately 30 miles, 30 miles, and 35 miles southwest, respectively. The Pala Casino and Pechanga Entertainment Center are located 32 miles and 35 miles to the northwest, respectively. Finally, the Golden Acorn facility is located 40 miles to the south.

TABLE 3.6-15
LOS COYOTES SITE LOCAL MARKET TRIBAL CASINOS

Casino Name	Owning Tribe	Location	Distance (miles)	Casino Status
Barona Valley Ranch Resort and Casino	Barona Band of Mission Indians	Lakeside	30	Open
Cahuilla Creek Casino	Cahuilla Band of Indians	Anza	25	Open
Golden Acorn	Campo Band of Kumeyaay Indians	Campo	40	Open
Harrah’s Rincon Casino and Resort	Rincon Band of Mission Indians	Valley Center	25	Open
Pala Casino	Pala Band of Mission Indians	Pala	32	Open
Pechanga Resort and Casino	Pechanga Band of Luiseno Indians	Temecula	35	Open
Santa Ysabel Casino	Santa Ysabel Band of Diegueño Indians	Santa Ysabel	11	Open
Sycuan Casino	Sycuan Band of the Kumeyaay Nation	El Cajon	35	Open
Valley View Casino	San Pasqual Band of Mission Indians	Valley Center	25	Open
Viejas Casino & Turf Club	Viejas Band of the Kumeyaay Indian Nation	Alpine	30	Open
Source: AES, 2010.				

Viejas Casino & Turf Club

The Viejas Casino and Turf Club recently underwent an expansion. The facility includes a gaming area with approximately 2,250 slot machines, 80 table games, a 750-seat bingo pavilion, and a 150-seat off-track betting facility. In addition, the facility includes entertainment and shopping facilities, as well as six restaurants. Access ramps to Interstate 8 are located just south of the facility.

Pechanga Resort and Casino

The Pechanga Resort and Casino has a 188,000 square-foot gaming floor with 2,000 slot and video machines and 160 table games. The facility also has several dining establishments, including eight restaurants and a five-unit food court, as well as an entertainment area that hosts concerts and sporting events and a 522-room hotel. It is accessible from State Highway 79 in Temecula, California.

Barona Valley Ranch Resort and Casino

The Barona Valley Ranch Resort and Casino is a casino/resort complex with an eight-story 397-room hotel and a golf course. The casino includes a gaming area that is open 24 hours a day with 2,000 slot machines, 70 table games, a 15-table poker room, and a 136-seat off-track betting area. In addition, the facility includes four restaurants and a four-unit food court. The facility is accessible from Route 67 along Wildcat Canyon Road.

Pala Casino

The Pala Casino includes a gaming area with 2,250 slot machines and 87 table games. In addition, the facility includes a 507-room hotel, eight restaurants, a 2,000 seat outdoor theater, and a 30,000 square foot convention center. It is accessible from State Highway 76.

Harrah's Rincon Casino and Resort

The Harrah's Rincon Casino and Resort includes a gaming area with 1,600 slot machines, 51 table games, and a 12-table poker room. In addition, the facility includes a 21-story hotel tower with 653 rooms, eight restaurants, and an entertainment complex for concerts. Regional access to the facility is from State Highway 76 and Interstate 15.

Cahuilla Creek Casino

The Cahuilla Creek Casino is a relatively small facility that is open 24 hours a day and consists of a gaming area with 250 slot machines and three blackjack tables, a café, and a nightclub. It is remotely located along State Highway 371.

Valley View Casino

The Valley View Casino has a gaming area with 1,260 slot machines and 10 table games. In addition, the facility includes two restaurants, a bar, and a six-story parking structure. The facility is in the process of expanding, to include five new dining areas and expanded gaming and entertainment space. The facility is accessible from County Highway S6 in Valley Center, California near Lake Wohlford Road.

Santa Ysabel Casino

The Santa Ysabel Casino includes a 35,000 square foot gaming area with 349 slot machines and seven table games. The property has two restaurants. The facility is located on Highway 79 in North San Diego County near Lake Henshaw between the towns of Santa Ysabel and Warner Springs.

3.7 TRANSPORTATION/CIRCULATION

This section describes the existing environmental conditions for the proposed Barstow and Los Coyotes sites. The general and site-specific profiles of transportation and circulation contained herein provide the environmental baseline by which direct, indirect, and cumulative environmental effects are identified and measured in **Chapter 4.0**.

3.7.1 BARSTOW SITE

The following information regarding traffic and circulation in the vicinity of the Barstow site is summarized from the Los Coyotes Casino Barstow Site Traffic Impact Analysis (TIA), provided as **Appendix H**.

Existing Circulation Network

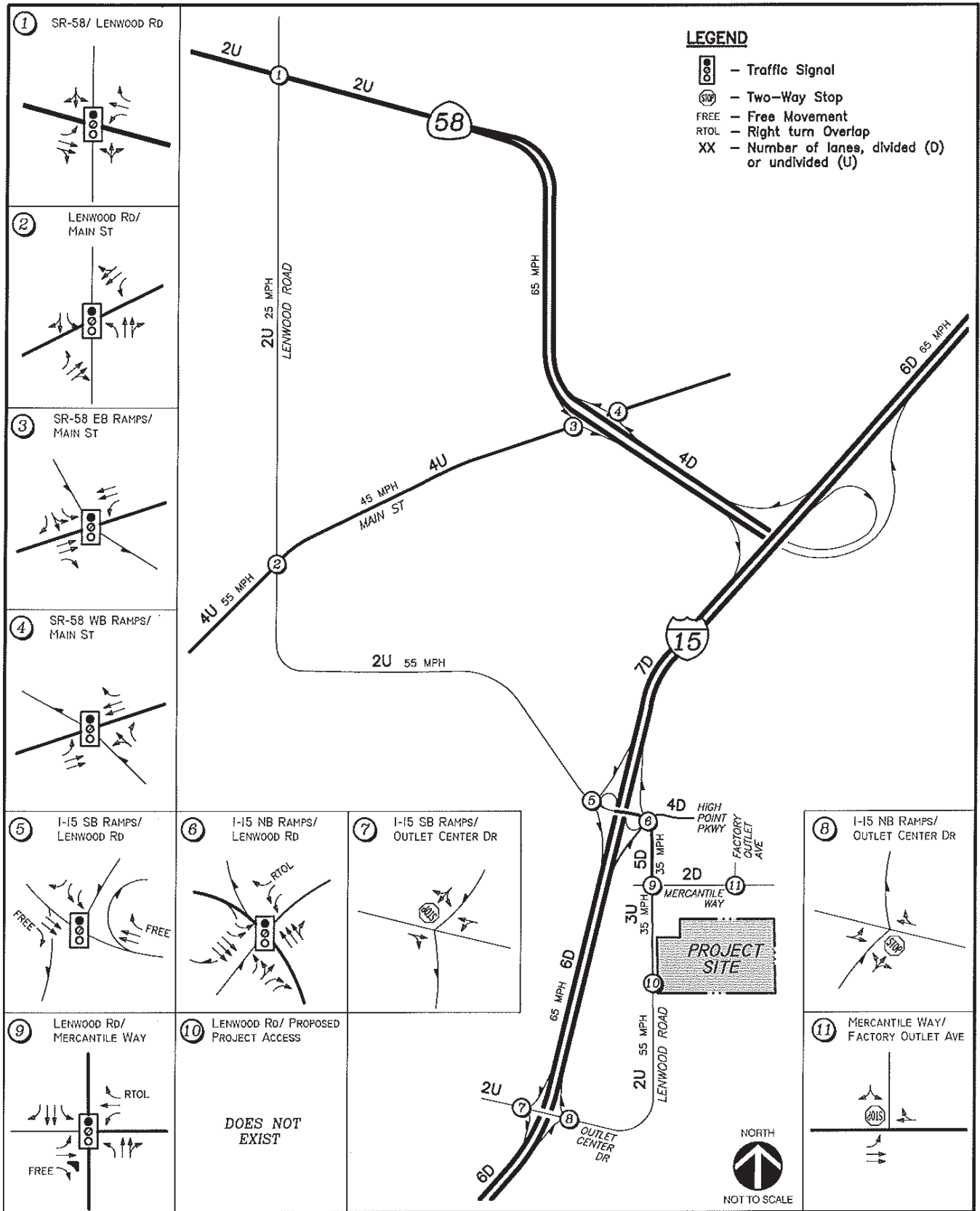
The Barstow site is located east of Lenwood Road, just south of Mercantile Way in the City of Barstow (City). Regional access to the Barstow site is provided by Interstate 15 (I-15) and State Route 58 (SR-58). Various roadways in the vicinity of the site provide local access. The east-west roadways that provide access to the site include Main Street, Mercantile Way, and Outlet Center Drive. North-south roadways that provide local access include Lenwood Road, High Point Parkway, and SR-58. **Figure 3.7-1** shows the existing transportation network in the vicinity of the Barstow site, including lane geometry and traffic controls. The following is a description of the roadway facilities and freeways in the project area.

Interstate 15

This north-south oriented interstate freeway is six-lane divided to seven-lane divided and classified as an Existing Freeway in the City's General Plan Circulation Element (Circulation Element). I-15 provides regional access between areas in southern California, including San Bernardino, Los Angeles, and San Diego counties, and areas to the northeast, including Las Vegas, Nevada, and Utah. The freeway traverses east-west through central Barstow. It currently carries approximately 57,000 to 73,000 vehicles per day in the study area.

State Route 58

This north-south and east-west oriented State highway is two lane undivided to four lane divided and classified as a Proposed Freeway in the Circulation Element. The eastern terminus of SR-58 is located at I-15 to the north of Barstow. SR-58 provides regional access westerly to Bakersfield and northern California cities. Its existing alignment traverses along the northerly portion of the City. It currently carries approximately 11,400 to 12,000 vehicles per day in the study area.



SOURCE: Linscott Law & Greenspan Engineers, 5/21/2009; AES, 2010

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Figure 3.7-1
Barstow Site Existing Transportation Network

Main Street

This east-west roadway is four lane undivided and classified as a Major Highway in the Circulation Element. Main Street is the key east-west arterial through the City. It currently carries approximately 3,400 to 8,200 vehicles per day in the study area.

High Point Parkway

This east-west roadway is four lane divided and classified as a Proposed Major Highway in the Circulation Element. It currently carries approximately 4,700 vehicles per day in the study area.

Mercantile Way

This east-west roadway is two lane undivided and classified as a Major Highway in the Circulation Element. It currently carries approximately 1,400 vehicles per day in the study area.

Outlet Center Drive

This east-west roadway is two lane undivided and not classified in the Circulation Element. Outlet Center Drive provides secondary access to Lenwood Road and the I-15 freeway interchange commercial area. It currently carries approximately 800 vehicles per day in the study area.

Lenwood Road

This north-south and east-west roadway is two lane undivided to three lane undivided to four lane divided and classified as a Major Highway in the Circulation Element. Lenwood Road serves the west end of Barstow. It currently carries approximately 120-890 vehicles per day in the study area.

Factory Outlet Avenue

This north-south roadway is unpaved and not classified in the Circulation Element. It currently carries approximately 800 vehicles per day in the study area.

Transit, Bicycle and Pedestrian Facilities

Public transportation is available in the form of fixed route and Dial-A-Ride service operating six days per week by the Barstow Area Transit. There are currently three primary routes that provide service to all of the major traffic generators/attractions in the City. All routes currently begin and end at the Harvey House/Transit center and operate at one-hour headways, with each route leaving at the top of the hour between 7:00 a.m. and 6 p.m. Separate facilities for bicycles or equestrian users have not been provided within the present circulation system for the City. Bicycles utilize public roadways along with other traffic. Lenwood Road east of the I-15 Freeway and Main Street are currently part of the existing city-wide bicycle plan.

Analysis Methodologies

Operating conditions experienced by drivers are described in terms of Level of Service (LOS). This term is a qualitative measure that includes factors such as speed, travel time, delay, freedom to maneuver, and

driving comfort and convenience. LOS is represented as letters ranging from A to F, whereby LOS A represents the best traffic flow driving conditions and LOS F represents the worst traffic flow driving conditions. The operating conditions of signalized and unsignalized intersections are quantified based on average control delay per vehicle per second methodology in the *2000 Highway Capacity Manual*, while roadway segments use volume-to-capacity ratios. **Table 3.7-1** relates the operational characteristics associated with each LOS category for both signalized and unsignalized intersections.

TABLE 3.7-1
INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Expected Delay	Average Total Delay Per Vehicle (Seconds)	
		Signalized	Unsignalized
A	Progression is extremely favorable. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	0 to 10.00	0 to 10.00
B	Good progression and/or short cycle lengths. More vehicles stop than for Level of Service A, causing higher levels of average total delay.	10.01 to 20.00	10.01 to 15.00
C	Fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.	20.01 to 35.00	15.01 to 25.00
D	Noticeable congestion. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines.	35.01 to 55.00	25.01 to 35.00
E	The limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high volume to capacity ratios. Individual cycle failures are frequent occurrences.	55.01 to 80.00	35.01 to 50.00
F	Unacceptable to most drivers. This condition often occurs with oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high volume to capacity ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.	80.01 and up	50.01 and up

Source: Transportation Research Board, 2000.

Roadway and freeway capacity is generally defined as the number of vehicles that can be reasonably expected to pass over a given section of road in a given time period. **Table 3.7-2** illustrates the relationship between volume to capacity ratio and LOS.

Study Roadway Segments and Intersections

The identification of the study area was based on estimated traffic volumes on roadways near the project site and through a series of scoping discussions with the City, San Bernardino Association of Governments (SANBAG), and California Department of Transportation (Caltrans) to determine the intersections, roadway segments, and freeway facilities requiring analysis. Study intersections and roadway segments evaluated under existing conditions for the Barstow site are shown in **Figure 3.7-1** and listed below:

Intersections

1. Lenwood Road/SR-58
2. Lenwood Road/Main Street
3. SR-58 East-bound (EB) Ramps/Main Street
4. SR-58 West-bound (WB) Ramps/Main Street
5. I-15 Freeway SB Ramps/Lenwood Road
6. I-15 Freeway SB Ramps/Outlet Center Drive
7. I-15 Freeway NB Ramps/Lenwood Road
8. I-15 Freeway NB Ramps/Outlet Center Drive
9. Lenwood Road/Mercantile Way
10. Lenwood Road/Project Access
11. Factory Outlet Avenue/Mercantile Way

TABLE 3.7-2
ROADWAY AND FREEWAY SEGMENT LEVEL OF SERVICE DEFINITIONS

LOS	Daily Roadway Capacities			Freeway V/C Ratio	Description of Travel Conditions
	2 Lns	4 Lns	6 Lns		
A	7,000	15,000	25,000	< 0.41	No physical restriction on operation speeds
B	8,000	18,000	28,000	0.42-0.62	Stable flow with few restrictions on speed and lane changing.
C	10,000	22,000	32,000	0.63-0.80	Stable flow with more restrictions on speed and lane changing.
D	12,000	26,000	35,000	0.81-0.92	Approaching unstable flow, little freedom to maneuver and short periods of heavy restrictions on flow.
E	14,000	28,000	38,000	0.93-1.00	Unstable flow, low operating speeds and some momentary stoppages
F	14,000	28,000	38,000	1.01-1.25	Forced flow operations at low speeds where the highway acts as a storage area and there are many stoppages.
V/C = Volume to Capacity; Lns = Lanes Source: LLG, 2010					

Roadway Segments

1. Lenwood Road - I-15 NB Ramps to Mercantile Way
2. Lenwood Road - Mercantile Way to Project Access
3. Lenwood Road - Project Access to Outlet Center Drive
4. Outlet Center Road - Lenwood Road to I-15 NB Ramps

Freeway Segments

I-15 Freeway Southbound:

- L Street to Lenwood Road
- Outlet Center Drive to Hodge Road

I-15 Freeway Northbound:

- L Street to Lenwood Road
- Outlet Center Drive to Hodge Road

Data Collection

Existing traffic volumes counts were performed for mid-day and PM weekday and Saturday peak hours by Linscott, Law & Greenspan (LLG) in January 2010 (**Appendix H**). Truck traffic was segregated from passenger vehicle volumes and were converted to passenger car equivalent (PCE) using conversion factors presented in the 2010 Los Coyotes Casino Barstow Site TIA (**Appendix H**)

Existing Intersection Performance

Table 3.7-3 shows the weekday and Saturday intersection delay and LOS for both the mid-day and evening peak hours at each of the study intersections. As shown in the table, each of the study intersections operates at an acceptable LOS of D or better under existing conditions. The existing weekday and Saturday peak hour turning volumes at each of the study intersections are provided in the TIA in **Appendix H**.

TABLE 3.7-3
BARSTOW EXISTING INTERSECTION LEVEL OF SERVICE

Intersections	Traffic Controls	Peak Hour Delay-LOS							
		Weekday				Saturday			
		Mid-Day		PM		Mid-Day		PM	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Lenwood Rd./SR-58	TS	9.8	A	7.6	A	7.4	A	7.9	A
2. Lenwood Rd./Main St.	TS	31.2	C	28.3	C	28.7	C	27.9	C
3. Main St./SR-58 EB Ramps	TS	3.0	A	2.4	A	3.2	A	2.2	A
4. Main St./SR-58 WB Ramps	TS	9.4	A	12.1	B	9.8	A	10.6	B
5. Lenwood Rd./I-15 SB Ramps	TS	10.3	B	10.1	B	10.3	B	9.9	A
6. Lenwood Rd./I-15 NB Ramps	TS	15.4	B	14.4	B	17.6	B	14.0	B
7. Outlet Center Dr./I-15 SB Ramps	OWSC	9.6	A	9.8	A	10.9	B	10.3	B
8. Outlet Center Dr./I-15 NB Ramps	OWSC	8.9	A	8.6	A	9.2	A	8.8	A
9. Lenwood Rd./Mercantile Way	TS	26.7	C	25.9	C	28.6	C	28.1	C
10. Factory Outlet Ave/Mercantile Way	OWSC	8.5	A	8.5	A	8.5	A	8.5	A

Notes: TS = traffic signal, OWSC = One-Way Stop Controlled
Source: LLG, 2010.

Existing Roadway Segment Performance

Existing volume to capacity ratios and LOS has been calculated for the study area roadway segments and are shown in **Table 3.7-4**. As shown in the table, all of the study roadway segments operate within an acceptable LOS under existing traffic conditions.

Existing Freeway Segment Performance

Existing volume to capacity ratios and LOS has been calculated for the study area freeway segments and are shown in **Table 3.7-5**. As shown in the table, all of the study freeway segments operate within an acceptable LOS under existing traffic conditions.

TABLE 3.7-4
BARSTOW EXISTING ROADWAY SEGMENT LEVEL OF SERVICE

Roadway	Segment	Number of Lanes	LOS E Capacity	V/C	LOS
Lenwood	I-15 NB Ramps to Mercantile Way	5D	33,000	0.32	A
Lenwood	Mercantile Way to Holiday Inn Driveway	3U	21,000	0.11	A
Lenwood	Holiday Inn Driveway to Outlet Center Drive	2U	14,000	0.09	A
Outlet Center Drive	Lenwood Road to I-15 NB Ramps	2U	14,000	0.07	A
Notes: D = divided roadway, U = undivided roadway V/C = volume to capacity ratio SOURCE: LLG, 2010.					

TABLE 3.7-5
BARSTOW EXISTING FREEWAY SEGMENT LEVEL OF SERVICE

Roadway Segments	Number of Lanes	Capacity	V/C		LOS	
			Mid-day	PM	Mid-day	PM
I-15 Northbound						
L Street to Lenwood Road	3	6,900	0.308	0.233	B	B
Outlet Center Drive to Hodge Road	3	6,900	0.283	0.214	B	B
I-15 Southbound						
L Street to Lenwood Road	3	6,900	0.346	0.292	B	B
Outlet Center Drive to Hodge Road	3	6,900	0.318	0.268	B	B
Notes: V/C = volume to capacity ratio Source: LLG, 2010.						

3.7.2 LOS COYOTES SITE

The following information regarding the existing transportation network in the vicinity of the Los Coyotes site, including lane geometry and traffic controls is summarized from the Los Coyotes Casino Traffic Impact Analysis (TIA), provided as **Appendix H**.

Existing Circulation Network

The project site is located in San Diego County. SR-79 provides regional access to the Reservation. Local access to the site is provided by an existing unnamed access road north of Camino San Ignacio Road. Roadways within the study area include SR-79, Stage Road, Camino San Ignacio Road, San Felipe Road, and SR-76. The following is a description of the roadway facilities and state highways in the project area:

SR-79

This north-south and east-west roadway is two-lane undivided to two-lane divided. It currently carries approximately 1,600 to 3,100 vehicles per day in the study area.

SR-76

This north-south roadway is two-lane undivided. It currently carries approximately 1,900 vehicles per day in the study area.

Stage Road

This north-south roadway is two-lane undivided. It currently carries approximately 50 vehicles per day in the study area.

Camino San Ignacio Road

This north-south and east-west roadway is two-lane undivided. It currently carries approximately 500 vehicles per day in the study area.

San Felipe Road

This east-west roadway is two-lane undivided. It currently carries approximately 900 vehicles per day in the study area.

Transit, Bicycle and Pedestrian Facilities

The Los Coyotes study area is not currently served by the San Diego Metropolitan Transit System or any other public transportation system. Designated bikeway facilities do not exist in the vicinity of the Los Coyotes site.

Analysis Methodologies

The analysis methodologies discussed for the Barstow site are the same for the Los Coyotes site. **Table 3.7-1** relates the operational characteristics associated with each level of service category for both signalized and unsignalized intersections, and **Table 3.7-2** illustrates the relationship between roadway capacity and LOS.

Study Intersections and Roadway Segments

The identification of the study area was based on estimated traffic volumes on roadways near the Los Coyotes site. Study intersections and roadway segments evaluated in the traffic study are shown in Kunzman TIA (**Appendix H**) and listed below:

Intersections

1. SR-79/Stage Road
2. SR-79/Camino San Ignacio Road
3. SR-79/San Felipe Road

4. SR-79/SR-76

Roadway Segments

- Camino San Ignacio Road east of SR-79

Data Collection

Existing traffic volumes were established through weekday and Saturday mid-day and evening peak hour traffic counts obtained by Kunzman Associates in September 2006 (**Appendix H**). Supplemental traffic data was acquired from the *2005 Traffic Volumes on California State Highways* (Caltrans, 2005).

Existing Intersection Performance

Table 3.7-6 shows the weekday and Saturday intersection delay and LOS for both the mid-day and evening peak hours at each of the study intersections. As shown in the table, each of the study intersections operates at an acceptable LOS of D or better under existing conditions. The existing weekday and Saturday peak hour turning volumes are provided in the TIA in Appendix H.

TABLE 3.7-6
LOS COYOTES EXISTING INTERSECTION LEVEL OF SERVICE

Intersection	Traffic Control ¹	Peak Hour Delay							
		Weekday				Saturday			
		Mid-Day		Evening		Mid-Day		Evening	
		V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
1. SR-79/Stage Road	CSS	8.8	A	8.8	A	9.7	A	9.5	A
2. SR-79/Camino San Ignacio Road	CSS	9.0	A	8.8	A	9.5	A	9.0	A
3. SR-79/San Felipe Road	CSS	9.7	A	9.4	A	10.1	B	9.6	B
4. SR-79/SR-76	CSS	9.7	A	9.7	A	11.2	B	10.5	B

Notes: TS = traffic signal, CSS = cross street stop; V/C = Volume to Capacity.
Source: Kunzman, 2007.

Existing Roadway Segment Performance

The existing volume to capacity ratio and level of service has been calculated for the study area roadway segment and is shown in **Table 3.7-7**. As shown in the table, the study roadway segment operates within an acceptable LOS under existing traffic conditions.

TABLE 3.7-7
LOS COYOTES EXISTING ROADWAY SEGMENT LEVEL OF SERVICE

Roadway	Segment	Number of Lanes	LOS D Capacity	V/C	LOS
Camino San Ignacio	South of SR-79	2U	10,900	0.05	A

U = undivided roadway; V/C = volume to capacity ratio
Source: Kunzman, 2007.

3.8 LAND USE

This section describes the existing environmental conditions for the proposed Barstow and Los Coyotes sites. The general and site-specific profiles of land use contained herein provide the environmental baseline by which direct, indirect, and cumulative environmental effects are identified and measured in **Chapter 4.0**.

3.8.1 BARSTOW SITE

Regional and Local Setting

The City of Barstow (City) has a population of 23,599 people and encompasses approximately 33 square miles (California Department of Finance, 2006). The City is located in the western Mojave Desert approximately halfway between Los Angeles and Las Vegas on Interstate 15. The City is located on a major transportation corridor as Interstates 15 and 40, and State Highways 58 and 247 (also referred to as Barstow Road) converge within the city limits (City of Barstow, 2010).

The Barstow site is located at the outskirts of the City near Interstate 15. To the south are undeveloped and vacant lands. To the east is the Stoddard Valley Off-Highway Vehicle (OHV) area, which comprises 33,500 acres and is under the jurisdiction of the Bureau of Land Management (BLM). The land contains rolling hills, steep mountains, winding sandy washes, and open valleys and is available for all forms of motorized vehicle use (City of Barstow, 1997). Camping is also allowed, as is the use of shotguns during hunting season (BLM, 2006b).

To the north and west are commercially developed areas surrounding the Interstate-15 and Lenwood Road interchange. The businesses at the interchange include outlet malls, restaurants, and hotels. This commercial area is set apart from the rest of the City by at least 1 mile of undeveloped land. Immediately north of the Barstow site and south of Mercantile Way are several fast food restaurants and a few undeveloped parcels. These restaurants are accessed from Lenwood Road. North of Mercantile Way is the Barstow Outlet Mall, which contains approximately 35 outlet stores and restaurants. The Barstow Outlet Mall contains space for approximately 100 businesses, but is currently 60 to 65 percent vacant. Lenwood Road runs adjacent to the western boundary of the Barstow site. To the west and across Lenwood Road are a hotel and the Tanger Outlet Mall, which includes approximately 40 outlet stores and restaurants.

The Barstow site consists of three undeveloped parcels, APN# 0428-171-66, 0428-171-67, and 0428-171-68, comprising approximately 23.1 acres of land in the southwestern portion of the City. Regional access is provided via Interstate 15. Local access to the Barstow site is provided by Lenwood Road. The topography of the property consists of flat, open terrain. The Barstow site is within the City limits and planning authority resides with the City. The property is not used for hunting, fishing, hiking, timber harvesting, mining, or recreational activities.

Guidance Documents and Zoning

Land use planning and development for the Barstow site is guided by the City of Barstow General Plan Community Development Element, Lenwood Specific Plan, City of Barstow Zoning Ordinance, and the applicable Redevelopment Plan. 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.

Barstow General Plan

The Barstow Planning Area is the geographical area addressed by the Barstow General Plan (City of Barstow, 1997) and extends beyond the city limits (**Figure 3.8-1**). The Barstow Planning Area encompasses over 208 square miles, and consists of the Corporate Area, Sphere of Influence and Area of Interest. The Barstow site is within the Barstow Corporate Area, which includes incorporated areas of Barstow and is developed according to the General Plan, City Zoning Ordinance, and applicable Specific Plans as discussed below. The site is designated as Visitor-Serving Commercial, which is intended to provide retail and service facilities for persons traveling along nearby highways (City of Barstow, 2009).

The central purpose of the General Plan is “to guide orderly growth and anticipate community changes in a way which promotes the health and safety of residents and visitors” (City of Barstow, 1997). The document contains long-range goals and specific policies for future development of the City. The General Plan contains eight elements, including the Community Development Element and the Recreation and Open Space Element, which are discussed below.

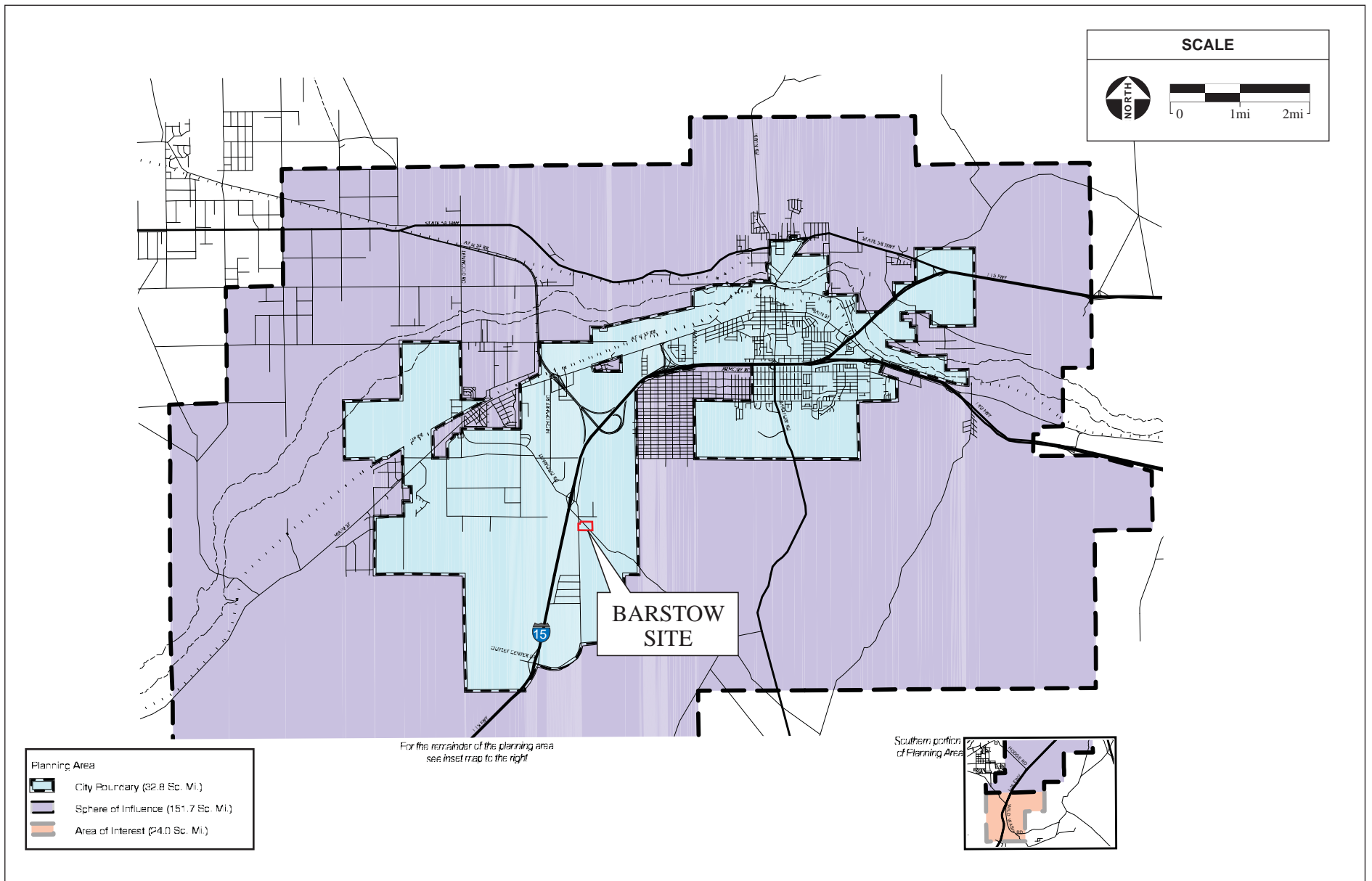
Community Development Element

The Community Development Element addresses the general distribution, location, and intensity of land uses proposed for the City (City of Barstow, 1997). Additionally, this element addresses landscaping and entryways to the City. The western part of the Barstow site is in an area identified for expected growth. The outlet mall and retail development in this area are designated for expansion. Several points around the City are marked as entryways to the community. The Barstow site is near an area marked for proposed signage and design for an entryway concept (along Interstate 15 for northbound travelers, 150 feet before Lenwood Road). The western part of the Barstow site contains a Flood Designated Area overlay. Potential impacts related to flooding are discussed in **Section 4.7**.

Open Space and Recreation Element

The Open Space and Recreation Element addresses the comprehensive and long-range plan for preservation and conservation of open space. According to the element, open space preservation is essential for natural resources, the production of resources, outdoor recreation, and public health and safety. There are many identified recreational resources that are not within the City's direct control, including school districts, parks within the Barstow Park and Recreation District, and BLM areas. The City of Barstow Parks and Recreation Department manages, develops, and maintains parks and recreation facilities within a 510-square mile region.

There are no designated recreation or open space areas on the Barstow site. An area parallel to Mercantile Way, north of the Barstow site, is identified as a recreation corridor and areas just east of the



SOURCE: City of Barstow General Plan, 1996; AES 2010

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Figure 3.8-1
City of Barstow Planning Area

site are identified as OHV areas on the Open Space/Recreation Plan Map.

Lenwood Specific Plan

Specific plans combine the effect of general planning and zoning for designated areas. Land use designations and development standards within specific plans tend to be more specialized than those contained in the city general plans or city zoning ordinances. The Barstow site is located within the Lenwood Specific Plan Boundary (City of Barstow, 2000; City of Barstow 2010). The site is designated as Commercial-Recreational/Transition within the Lenwood Specific Plan (**Figure 3.8-2**).

Development standards and criteria are contained in Section 3.0 of the Lenwood Specific Plan. The area contains approximately 2,280 acres of industrial, highway commercial and related uses. Land uses include outlet centers, freight distribution uses, fast-food restaurants, hotels, and truck stops.

The Barstow site is located within a Transitional area, as designated by the Lenwood Specific Plan. Development within Transitional areas requires a conditional use permit to ensure compatibility with the adjacent off-highway vehicle areas and to ensure the property has adequate provisions for water, sewer, electricity, gas, telephone, and storm drainage. Commercial development in a transitional area requires connection to a public sewer system to be financed and constructed by the property owners.

City of Barstow Zoning Ordinance

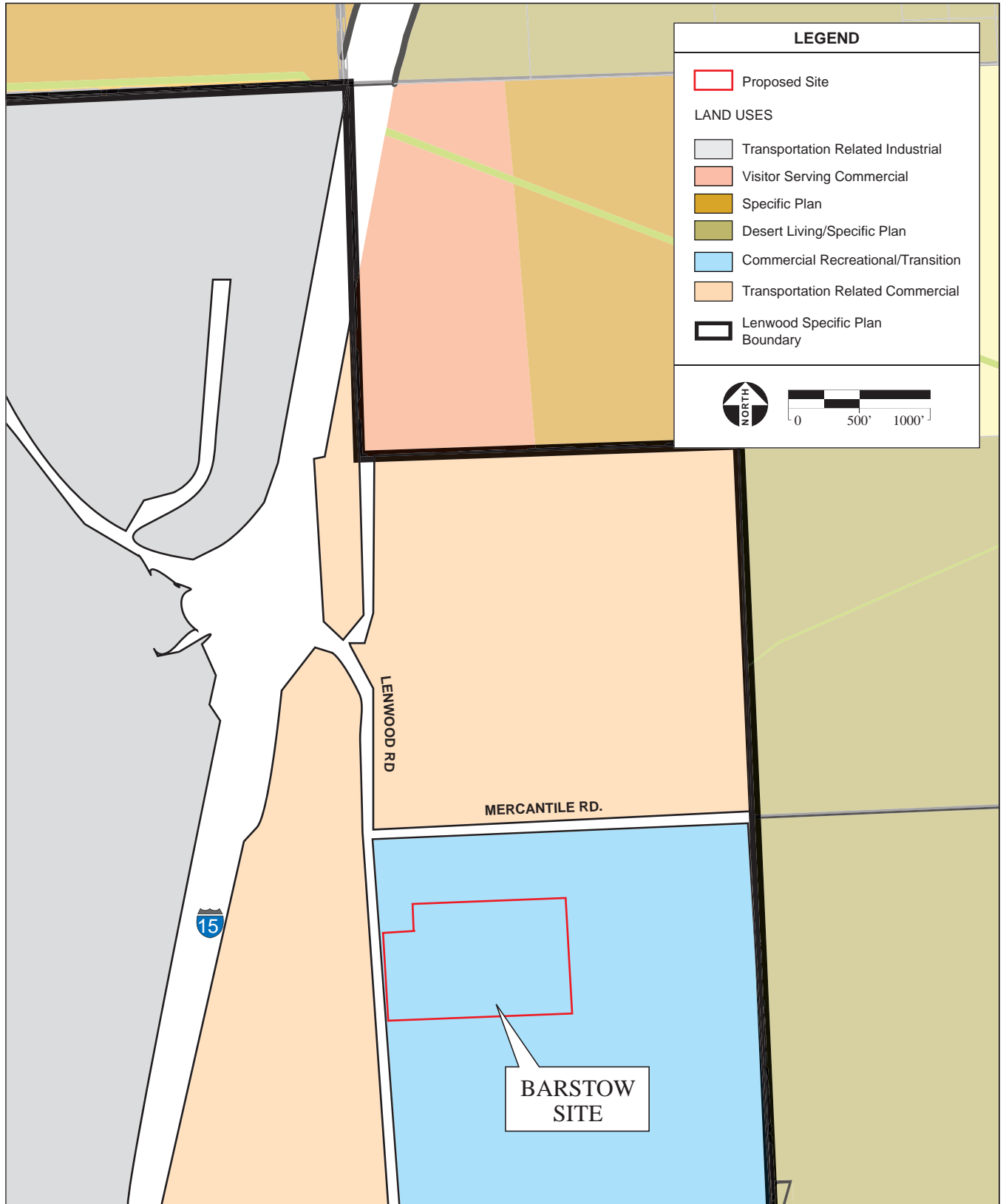
The Barstow site is zoned as Specific Plan on the City of Barstow Zoning Map and shown on **Figure 3.8-3** (City of Barstow, 2000). The City Zoning Ordinance is used to direct growth according to the General Plan. Minimum lot size, setbacks, and maximum heights for areas zoned as Specific Plan are contained within Section 3.0 of the Lenwood Specific Plan.

Redevelopment Plan

The City has two Redevelopment Areas for which plans were developed to address blight as specified in the California Community Redevelopment Law, California Health and Safety Code §33000. The Barstow site is within Redevelopment Project Area 1. The objective of the Redevelopment Plan is to eliminate or alleviate blight conditions including: inadequate/obsolete design, irregularly shaped and inadequately sized lots, declining property values, and economic maladjustment (City of Barstow, 1997). The Redevelopment Plan includes design guidelines related to mechanical screening, design integration of new structures, exterior elevations of new buildings, exterior lighting, and fencing materials.

Agriculture

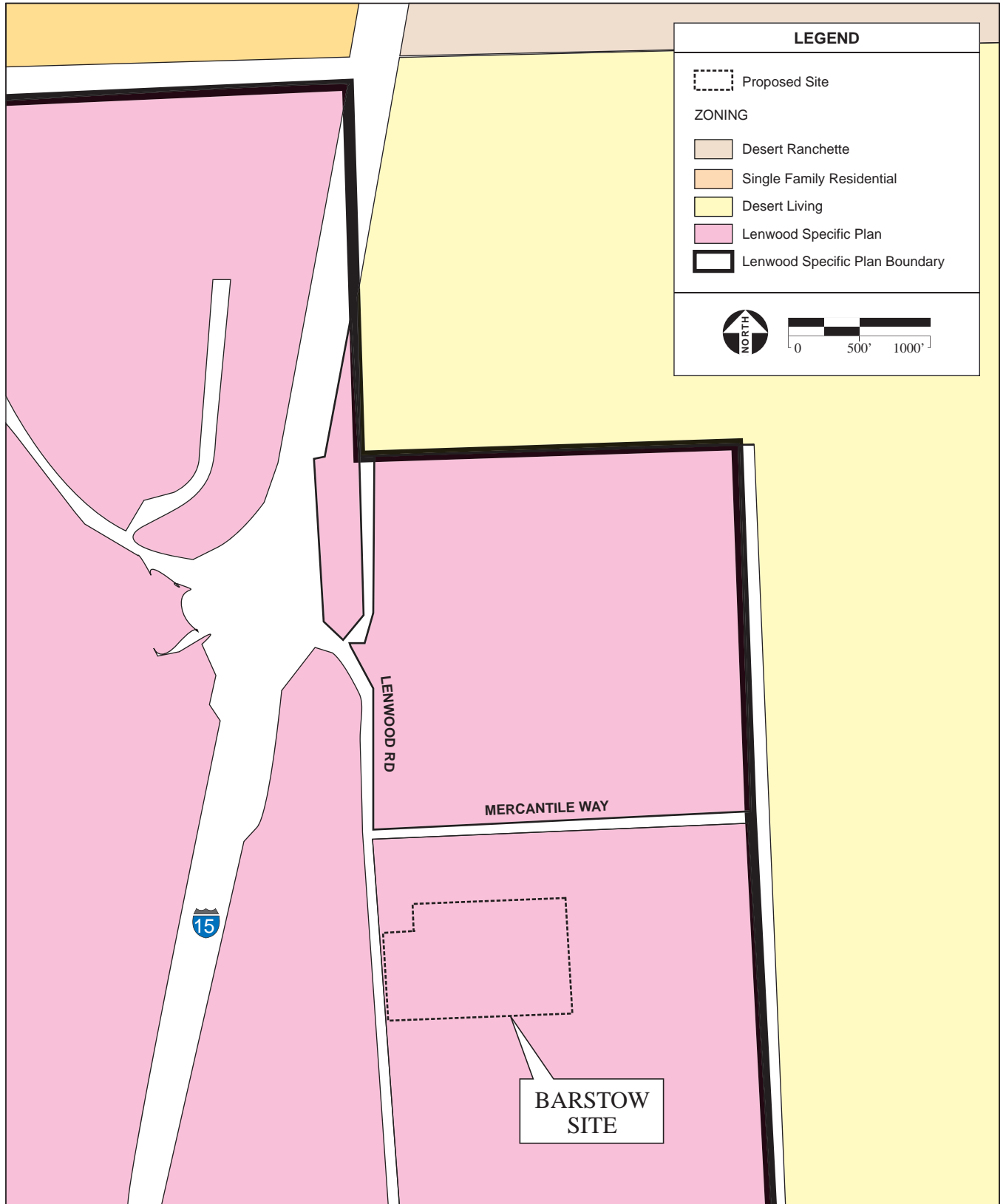
Due to the desert environment and water conservation issues, agriculture production is limited in the Barstow Planning area. Farmland does occur in the floodway, 100-year floodplain, or areas with significant aggregate resources (City of Barstow, 1997). All agriculture in the Barstow Planning Area is irrigated. The California Department of Conservation (CDOC) map of important farmland shows the Barstow site as an area of potential grazing land (CDOC, 2006.) The areas most likely to serve agricultural areas in the Barstow Planning Area are north of the City along the Mojave River. Even this area is not viable for agriculture due to extensive water needs (City of Barstow, 1997). The General Plan



SOURCE: City of Barstow General Plan, June, 1997;
City of Barstow, 2006; AES, 2010

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Figure 3.8-2
City of Barstow General Plan



SOURCE: City of Barstow Planning Department. 4/28/00;
City of Barstow, 2006; AES, 2010

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Figure 3.8-3
City of Barstow Site Zoning

does not anticipate continuation of agricultural uses and prioritizes water conservation over loss of agricultural lands (City of Barstow, 1997).

Farmland Protection Policy Act

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 matter that is compatible with state and local units of government, and private programs and policies to protect farmland (7 U.S.C. § 4201).

The Natural Resource Conservation Service (NRCS), responsible for the implementation of the FPPA, categorizes farmland in a number of ways. These categories include: prime farmland, farmland of statewide importance, and unique farmland. Prime farmland is considered to have the best possible features to sustain long-term productivity. Farmland of statewide importance includes farmland similar to prime farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Unique farmland is characterized by inferior soils and generally needs irrigation depending on climate. The Land Evaluation and Site Assessment is a numeric rating system used by the NRCS to evaluate the relative agricultural importance of farmlands. This evaluation is completed on Form AD 1006, the Farmland Conversion Impact Rating Form. Consultation with the NRCS has shown that the Barstow site does not contain prime farmland, unique farmland, or farmland of statewide or local importance (**Appendix I**).

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. Under the provisions of the Williamson Act, landowners contract with the county to maintain agricultural or open space use of their lands in return for a reduced property tax assessment. The contract is self-renewing and the landowner may notify the county at any time of intent to withdraw the land from its preserve status. Withdrawal involves a ten-year period of tax adjustment to full market value before protected open space can be converted to urban uses. There are no agricultural uses on the Barstow site and there are no existing Williamson Act contracts on the parcels comprising the Barstow site.

3.8.2 LOS COYOTES SITE

Regional and Local Setting

The Los Coyotes Reservation consists of 25,050 acres in northern San Diego County, approximately 6 miles east of the town of Warner Springs. Highway 79 North provides access to the Reservation. The Los Coyotes site consists of 19 acres in the southern portion of the Reservation, just east of San Ysidro Creek (**Figure 2-9**). The Los Coyotes site is undeveloped and does not contain urban features or land uses.

Land to the east of the Los Coyotes Reservation is part of Anza-Borrego State Park. This state park includes hiking trails, off-road vehicle areas, and camping; and is the largest state park in California. Lands to the northwest are part of the Cleveland National Forest and are controlled by the U.S. Forest

Service. The BLM owns the land to the south. To the west are residential, commercial, and recreational uses associated with Warner Springs and the Vista Irrigation District. Residences in this area are typically either single-family residences on lots of one acre or less or spaced rural residential homes on lots of one to ten acres. Some rural-residential housing near Warner Springs has small orchards, fields, and storage structures associated with the property. To the west of the Reservation is Warner Springs Ranch, a resort with 240 cottages and an 18-hole golf course. To the southwest are agricultural uses near Lake Henshaw, which is approximately 7 miles southwest of the Reservation.

Approximately 52 Tribal members live on the 25,050-acre Reservation, of which 2,100 acres are identified as areas of potential development (Marc Anderson, Inc., 2004). The development areas include the San Ignacio area and the San Ysidro Creek area. Development in other areas is limited by steep topography. Lands excluded from consideration for potential development include slopes exceeding 30 percent, severely eroded land, and rock land. Potential development opportunities include Tribal housing, community facilities, a health center, a Tribal office/administration complex, campgrounds, recreational use, agriculture, and a casino. New Tribal housing, if constructed, would be located in the central portion of the Reservation (Marc Anderson, Inc., 2004). The Los Coyotes site is not regularly used for activities such as hunting, fishing, hiking, or timber harvesting.

Guidance Documents and Zoning Ordinance

Because the Los Coyotes site is located on land that is held in trust by the BIA, it is not subject to San Diego County land use jurisdiction. The Reservation is within the North Mountain Planning Community Area and is designated as Tribal Lands on the General Plan Land Use Map (San Diego County, 2004). The Los Coyotes site is not within the range of influence of an airport. Land uses on the Los Coyotes Reservation are governed by the Los Coyotes Tribal Council.

Agriculture

Soils on the Reservation which would most likely serve agricultural uses belong to the Mottsville Series which could produce small grain and forage crops. Mottsville loamy coarse sand occupies 292 acres on the Reservation. Crop yields for this type of soil are contingent upon adequate winter rainfall. Loamy alluvial land occupies 138 acres and could be used for pasture. Crouch course sandy loam occupies 177 acres and may be suitable for apple or pear orchards (Marc Anderson Inc, 2004). The primary limit to cultivation on the Reservation is the steep topography. There are currently no agricultural activities on the Los Coyotes site or the remainder of the Reservation.

Farmland Protection Policy Act

Consultation with the NRCS has shown that the Los Coyotes site contains approximately 17 acres of farmland subject to evaluation under the Farmland Protection Policy Act. The Los Coyotes site contains approximately 2.7 acres of prime and unique farmland and 14.3 acres of farmland of statewide or local importance (**Appendix I**).

Williamson Act

There are no lands under a Williamson Act contract on the Los Coyotes site.

3.9 PUBLIC SERVICES

This section describes the existing environmental conditions for the proposed Barstow and Los Coyotes sites. The general and site-specific profiles of public services contained herein provide the environmental baseline by which direct, indirect, and cumulative environmental effects are identified and measured in **Chapter 4.0**.

3.9.1 WATER SUPPLY

Barstow Site

Water is supplied in the vicinity of the Barstow site by Golden State Water Company (GSWC) and private groundwater wells. The Barstow site does not have a connection to GSWC. The nearest line is a 16-inch diameter line that runs along the west side of Lenwood Road and terminates at Mercantile Way, just north of the Barstow site (HydroScience, 2006). The Mojave Water Agency (MWA) aids in the recharge of groundwater due to the overdraft condition of the Mojave Basin. A private groundwater well on the northeast portion of the Barstow site served a former residence and is no longer in use. The well was drilled in 1983 and is approximately 360 feet deep (Merrell Engineering Company, 2003). In 1996, the water level for this well was measured at 280.25 feet below ground surface (EDR, 2006a).

Golden State Water Company

GSWC is an investor-owned public utility and is a subsidiary of American States Water Company. The Barstow site is located in GSWC Region 3, which serves Los Angeles, San Bernardino, Imperial, and Orange counties and contains 21 separate water systems. Within Region 3, the Barstow site is located in the Barstow Customer Service Area, which is a part of the Mountain/Desert District. The Barstow Customer Service Area supplies water to the City of Barstow (City) and surrounding unincorporated areas.

The Barstow Customer Service Area of the GSWC has approximately 8,910 customers. Groundwater is pumped from the Mojave River basin-Centro sub basin, where groundwater is allocated subject to adjudication decisions. The Barstow system consists of 17 active groundwater wells and a 1.0 million gallon reservoir, which provide approximately 600 gallons per minute (gpm) on average. The wells have a current total active capacity of 16,147 acre-feet per year (ac-ft/yr). Actual pumping for these wells averaged 9,556 ac-ft/yr between 2000 and 2004. The GSWC has three licenses from the State Water Resources Control Board that allow GSWC to pump a maximum of 20.0 cubic feet per second (14,479 ac-ft/yr; GSWC, 2005). Subject to the adjudication decision of the Mojave River Basin, the GSWC had a Free Production Allowance of 16,784 ac-ft from 2005 to 2006. The adjudication and Free Production Allowance are discussed in more detail under the MWA below.

Mojave Water Agency

The MWA is responsible for water resource management in areas of the High Desert in San Bernardino County. The boundaries of the agency encompass 4,900 square miles including the Barstow site. Governed by a seven-member elected Board of Directors, the MWA is a state water contractor with

access to the State Water Project via the California Aqueduct and serves as Watermaster, settling overdraft issues in the Mojave Basin (MWA, 2006).

The State Water Project delivers water from the Sierras via the California Aqueduct. One of 29 state water contractors with access to this water source, the MWA connects to the California Aqueduct via the MWA Mojave River Pipeline, which is 76 miles long and consists of 24-inch diameter pipe. The pipeline extends from the California Aqueduct north of Barstow, to just east of Barstow. There are three recharge sites near Barstow: the Hodge, Lenwood, and Daggett/Yermo sites. At these locations, groundwater is recharged to compensate for overdraft conditions. The MWA is entitled to receive an annual allotment of 75,800 ac-ft/yr from the State Water Project (MWA, 2006).

Due to overdraft conditions in the Mojave River Basin, the City and Southern California Water Company filed a lawsuit in 1990 to guarantee water from upstream users. The result of this judgment was the establishment of Free Production Allowances (FPA) for water producers. Water produced in excess of the FPA must be replaced by the producer through payment to the MWA to purchase replacement water or through the transfer of unused FPA from another producer (MWA, 2006).

Los Coyotes Site

Groundwater wells and springs supply water in the vicinity of the Los Coyotes Reservation. Spring discharge ranges from 1 to 20 gpm and is used for both private water sources as well as a community system in the San Ysidro area (Marc Anderson, Inc., 2004). The well with the largest potential yield is the Flowing Artesian Well (10S/4E-13H1), which was pumped in 1940 at a rate of 135 gpm with a resulting draw down of 7 feet (Ballog and Moyle, 1980). While the potential yield of the well may exceed 500 gpm, the safe yield for the well is 62 gpm (Marc Anderson, Inc., 2004).

The Los Coyotes water system includes an upper water system and lower water system. The lower water system supplies tribal residences and tribal facilities in the San Ysidro Creek area by a gravity-fed water system built in the 1940s. The lower water system was rehabilitated by the U.S Department of Agriculture. Water is supplied by a community well. The system includes 8,900 feet of 6-inch diameter water main, 2 pressure-reducing stations, and a 140,000-gallon steel storage tank. The upper water system served the former campground and one residence for non-potable uses and is supplied by three springs. Springs are piped by gravity flow to concrete spring boxes and have an estimated flow of 7 gpm. The upper water system includes a 62,000-gallon storage tank and 6,000 feet of water line (Marc Anderson, Inc., 2004). This water system needs improvements to provide potable water to the campground and/or future development. Current water use is estimated at 2,500 gallons per day (gpd) for domestic use by tribal households on the Reservation. The total annual water used is estimated at 912,500 gallons or 2.8 ac-ft (Marc Anderson, Inc., 2004). Nearby water systems include the Vista Irrigation District (VID), which pumps groundwater southwest of the Reservation. The VID has a well field with 24 wells ranging from 150 to 350 feet in depth. From 2002-2003, approximately 11,130 ac-ft of groundwater were pumped (Marc Anderson, Inc., 2004). There are concerns of depleting groundwater resources due to groundwater pumping in this area.

3.9.2 WASTEWATER SERVICE

Barstow Site

The Barstow site is not currently connected to a public wastewater system. Wastewater service in the vicinity of the Barstow site is provided by the City. The nearest trunk sewer lines are located on Mercantile Way located less than a mile north of the Barstow site. Currently, peak wastewater flow to the City facility is 2.7 million gallons per day (mgd) (Barbour, 2009). The wastewater treatment plant has a treatment capacity of 4.5 mgd of average daily wastewater flow and a peak flow of 7.6 mgd (City of Barstow, 2008). Components of the wastewater treatment system include aeration basins, secondary clarifiers, a chlorine contact chamber, and a chlorine contact lagoon. The wastewater treatment plant provides primary and secondary treatment. Treated effluent is disposed to effluent percolation ponds with a capacity of 3.0 mgd. During peak flows wastewater is treated and then metered out to the effluent percolation ponds so capacity is not exceeded (HydroScience, 2006). Sludge from the secondary treatment system is dried and hauled off-site to a composting facility.

Los Coyotes Site

Individual septic systems are used throughout the Reservation for residential wastewater disposal. Wastewater is disposed to leach fields. Restrooms at campgrounds were closed due to septic system problems (Springer and Anderson, Inc., 1998).

3.9.3 SOLID WASTE SERVICE

California Integrated Waste Management Act

In 1989, the State of California enacted Assembly Bill 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.

Barstow Site

The last approved diversion rate for the City was 62 percent in 2006 (CIWMB, 2009). Solid waste and recycling in the City is collected by Burrtec Waste Industries, Inc., which is the authorized franchise hauler under contract with the City. Solid waste is hauled directly to the Barstow Landfill on Barstow Road, located off of Highway 247, approximately 3 miles outside of the city limits. The City has single stream recycling collection for residential and commercial customers. Bins are provided for co-mingled materials accepted in the recycling program. Commercial customers who generate large amounts of cardboard may be provided with a separate container for cardboard. Recyclables are hauled to the Material Recover Facility in Victorville, where they are sorted and processed for recovery. The following materials are accepted for recycling: mixed papers, glass and beverage containers, plastics, cans, and scrap metals (Barbour, 2009).

The Barstow Landfill accepts non-hazardous solid waste including construction/demolition, agriculture, industrial, sludge, and mixed municipal waste. The permitted capacity is 750 tons per day. The permitted

750 tons per day includes 150 tons of liquid from sewage ponds. As of March 2007 the landfill had a remaining capacity of 924,401 cubic yards; the current life expectancy of the landfill is 2012 (CIWMB, 2009). The Environmental Impact Report (EIR) to operate and expand the landfill from a 47-acre site to a 331-acre site was certified in October 2009. After expansion of the landfill, the permitted daily limit will be 1,500 tons per day and the landfill is predicted to last until 2070 (County of San Bernardino, 2006).

Los Coyotes Site

The last board approved diversion rate for the unincorporated County of San Diego was 54 percent in 2006 (CIWMB, 2009). Federal lands, including tribal land, are considered out-of-state and not included in calculation of county diversion rates.

Solid waste at the Reservation is collected by Ramona Disposal. Solid waste is hauled to the Ramona Material Recovery Facility and Transfer Station at 324 Maple Street in Ramona, California. The transfer station has a maximum permitted throughput of 370 tons per day and accepts construction/demolition, green materials, and mixed municipal wastes (CIWMB, 2009). From the transfer station, waste is hauled to the Ramona Landfill, Sycamore Sanitary Landfill, and Otay Landfill. Ramona Landfill receives most of the solid waste that Ramona Disposal collects.

The Ramona Landfill is located at 20630 Pamo Road in Ramona, California, approximately 34 miles southwest of the Los Coyotes site. The maximum permitted capacity is 295 tons per day (CIWMB, 2009). As of 2008 there were 589,000 cubic yards remaining out of a total disposal capacity of 2,200,000 cubic yards (Mohr, 2009). Accepted waste types include agricultural, construction/demolition, mixed municipal, sludge, tires, and wood waste. The estimated closure date of the landfill is 2011 (Mohr, 2009).

The Otay Landfill is located at 1700 Maxwell Road in Chula Vista, California, approximately 85 miles southwest of the Los Coyotes site. The landfill is permitted for a maximum permitted capacity of 5,830 tons per day. As of November 30, 2006 the remaining capacity is 33,070,879 cubic yards out of a total disposal capacity of 62,377,974 cubic yards. The landfill has a disposal acreage of 230 acres. Accepted waste types include agricultural, construction/demolition, green materials, mixed municipal, sludge, tires, and other designated wastes. The estimated closure date of the Otay landfill is 2021 (CIWMB, 2009).

The Sycamore Sanitary Landfill is located at 8514 Mast Boulevard in San Diego, California, approximately 63 miles southwest of the Los Coyotes site. The landfill is permitted for a maximum permitted capacity of 3,965 tons per day. As of September 30, 2006 the remaining capacity is 47,388,428 cubic yards out of a total disposal capacity of 48,124,462 cubic yards. The landfill has a disposal acreage of 324 acres. Accepted waste types include agricultural, asbestos, contaminated soils, mixed municipal, sludge, tires, shreds, wood waste, and other designated wastes. The estimated closure date of the Sycamore Sanitary Landfill is 2031 (CIWMB, 2009).

3.9.4 ENERGY

Barstow Site

Southern California Edison Company (SCE) provides electricity to approximately 13 million people in California and has a service area of approximately 50,000 square miles. SCE provides electricity to most of San Bernardino County, including the City. Energy sources include fossil fuels, natural gas, hydroelectric power, nuclear energy, and renewable resources. The former residence on the Barstow site was served by SCEC. Overhead 12 kilovolt lines remain along the northern portion of the project site and continue onto the Barstow site short of the eastern boundary (Merrell Engineering Company, 2003).

Southwest Gas Corporation provides natural gas services to the City. Southwest Gas Corporation is an investor-owned utility with 1.7 million customers in Arizona, Nevada, and California. The company had a throughput of 2.4 billion therms in 2007 (Southwest Gas Corporation, 2007). The nearest gas line is a 4-inch diameter line located along the Lenwood Road, adjacent to the eastern boundary of the Barstow site (Merrell Engineering Company, 2003).

Los Coyotes Site

San Diego Gas & Electric supplies electricity to the southwest portion of the Reservation. An overhead electrical line enters from the western portion of the Reservation and runs east, ending at a residence after the community center. One residence relies on solar panels. Tribal residents heat their homes with propane or wood-burning stoves.

3.9.5 LAW ENFORCEMENT SERVICES

Barstow Site

The Barstow Police Department (Department) provides law enforcement services within the City limits, which encompasses approximately 40 square miles and has a service population of 23,000. The Department is funded through the City budget. The main station is located at 220 East Mountain View Street and houses the patrol, records, dispatch, and evidence functions. An annex located at 500 Melissa Avenue in Barstow houses the investigative and code enforcement bureaus, as well as the crime analysis and training functions (Burns, 2009).

There are 40 sworn staff police officers that are assigned black and white police vehicles. Non-sworn staff are assigned to records, dispatch, code enforcement, and crime analysis. The Department has a 10-member Special Response Team (SRT) which is currently staffed with 8 officers. The Department has 11 patrol vehicles, an evidence/crime scene van, an SRT van, eight unmarked vehicles, one volunteer vehicle, and three code enforcement vehicles (Harpole, 2006).

Calls are assigned on a seniority rotation. Patrol is staffed at one sergeant and four officers per shift. The desired response times are 5 minutes for priority 1 calls and 20 minutes for non-critical calls. Average response times vary from 3-8 minutes (Burns, 2009). Based on traffic and conditions, drive time from the main station to the Barstow site on Interstate 15 may take as long as 15 minutes (Harpole, 2006). The location of police stations in relation to the Barstow site is shown in **Figure 3.9-1**.



SOURCE: ESRI Data, 2006; AES, 2010

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Figure 3.9-1
Barstow Public Services

The Barstow Police Department handled 33,683 calls for service (approximately 90 per day) in 2005. In 2005, there were 5,714 police reports filed and 2,368 arrests (Harpole, 2006). A summary of reported crimes for 2007 is provided in **Table 3.9-1**.

TABLE 3.9-1
CITY OF BARSTOW CRIME

Crime	Number of Incidents
Homicide	3
Rape	21
Robbery	72
Assault	241
Burglary	402
Larceny Theft	621
Motor Vehicle Theft	186
Arson	15
Total	1,561

Source: FBI, 2007.

The Sheriff's Department does not provide primary law enforcement services within the City limits but does provide mutual aid assistance on request. The Sheriff's Department has a Desert Rescue Squad, which provides search and rescue services in the High Desert. California Highway Patrol (CHP) is the primary law enforcement for state-owned facilities in the City and traffic enforcement on freeways. CHP also provides mutual aid assistance on request.

Los Coyotes Site

In the unincorporated areas of San Diego County, including on the Reservation, the San Diego Sheriff's Department provides general patrol and law enforcement investigative services. CHP provides traffic services. Under Public Law 280, the State and other local law enforcement agencies have enforcement authority over criminal activities on tribal land. The Sheriff's Department provides primary law enforcement services by contract to several incorporated areas including the cities of Del Mar, Encinitas, Imperial Beach, Lemon Grove, Poway, San Marcos, Santee, Solana Beach, and Vista. The Sheriff's Department provides general law enforcement and detention services in a service area encompassing approximately 4,200 square miles (San Diego County Sheriff's Department, 2009).

The Department includes eight major detention facilities, seven major patrol stations, nine patrol substations, a crime laboratory, a search and rescue team, and support operations. The Sheriff's Department has approximately 4,000 employees, including sworn officers and professional support staff. The Ranchita substation serves the Reservation and is located approximately 6 miles southwest of the Los Coyotes site. The Ranchita substation is responsible for over 1,400 square miles, approximately a third of San Diego County. Staffing includes one sergeant, 8 patrol deputies and accompanying support staff. Service areas include Warner Springs, Ranchita, Borrego Springs, and the Reservation. A police office under the Ranchita substation is located in Borrego Springs (San Diego County Sheriff's Department, 2009).

3.9.6 FIRE PROTECTION AND EMERGENCY MEDICAL SERVICES

Barstow Site

The Barstow Fire Protection District (District) provides fire prevention, fire safety and paramedic services to the City and surrounding County areas within the District boundaries. The service area is 60 square miles and includes the City and the communities of Lenwood, Grandview, North Barstow, and Barstow Heights (BFPD, 2006). The District also plans to provide service to areas corresponding to City annexations. The District is a Self Governed Special District. The District has Automatic and Mutual Aid Agreements with San Bernardino County Fire, Marine Base Fire (Department Of Defense), Fort Irwin Fire, and with volunteer departments in Daggett, Yermo, and Newberry. The San Bernardino County Fire Department operates the nearest fulltime fire station, approximately 30 minutes from Barstow (Corrao, 2009).

The District operates two stations: Stations 361 and 363. Fire Station 363 is the nearest station to the Barstow site and would provide primary response. Station 363 is located at 2600 West Main Street approximately 4 miles northeast of the Barstow site (**Figure 3.9-1**). Station 363 is equipped with 2 ICS Type-1 fire engines. Fire Station 361 could also provide service to the Barstow site and is located at 861 Barstow Road (**Figure 3.9-1**). Station 361 is equipped with one quint truck with a 75-foot aerial ladder, three ICS “Type-1” fire engines, and one water tender. The District has one paramedic engine per station, staffed with three full-time personnel. The District’s target response time is 5 minutes or less to 90 percent of calls, and the current average response is approximately 8 minutes. In 2008, the District responded to 4,200 calls for service (Carrao, 2009). To aid in fire suppression, projects within the District are required to meet minimum fire flows per the 2000 Uniform Fire Code and 2001 California Fire Code (Carrao, 2006).

The District also responds to emergency medical service calls. Ambulance service is provided by Desert Ambulance located at 831 West Main Street. The nearest emergency room is located at Barstow Community Hospital at 555 South 7th Street (**Figure 3.9-1**). Emergency air services are provided by Mercy Air for all emergencies requiring transport to a Trauma Center. The nearest trauma center is Arrowhead Regional Medical Center, located approximately 97 miles away in Colton, California. Should an emergency evolve a heart attack or other heart condition, the victim must be transported to the ST-Elevation Myocardial Infarction (STEMI) Receiving Center at St. Mary Medical Center in Apple Valley, approximately 23 miles south west of the Barstow site (Carrao, 2009).

Los Coyotes Site

The Los Coyotes site receives fire and emergency medical services from California Department of Forestry and Fire Protection (CDF) and Sunshine Summit Volunteers. The CDF Warner Springs station provides primary service to the Reservation and is located at 31049 Highway 79. The station is approximately 10 miles from the Reservation. The CDF Station is open year round. The Sunshine Summit Volunteers station is located at 35227 Highway 79 in Warner Springs, which is approximately 16.5 miles from the Reservation. The Sunshine Summit Volunteers would provide service if CDF engines were unavailable (Jones, 2006).

The CDF Warner Springs station is staffed year round and is equipped with one Type-II engine and one Type III engine. The station is staffed by two to three personnel 24 hours a day. The station receives 3-5 calls per week on average. The expected response time to the Los Coyotes reservation is 10 minutes for a fire engine and 20 minutes for an ambulance (Captain Johnson, 2009). The nearest ambulance is stationed near Lake Henshaw. Mercy Air provides emergency air transport and ambulance services. The nearest hospital is Palomar Medical Center located in Escondido approximately 55 miles from the Los Coyotes site.

3.10 NOISE

This section describes the existing environmental conditions for the proposed Barstow and Los Coyotes sites. The general and site-specific profiles of noise contained herein provide the environmental baseline by which direct, indirect, and cumulative environmental effects are identified and measured in **Chapter 4.0**.

3.10.1 ACOUSTICAL BACKGROUND AND TERMINOLOGY

Noise is often defined as unwanted sound. Pressure variations occurring frequently enough (at least 20 times per second) that the human ear can detect are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second, called hertz (Hz).

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. Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel (dB) scale was devised. The decibel 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 decibel scale allows a million-fold increase in pressure to be expressed as 120 dB. Another useful aspect of the decibel scale is that changes in levels (dB) correspond closely to human perception of relative loudness.

3.10.2 NOISE EXPOSURE AND COMMUNITY NOISE

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, sound level (L_{eq}) over a given time period (usually one hour). The L_{eq} is the foundation of the Day-Night Average Level noise descriptor (L_{dn}), and shows very good correlation with community response to noise. **Table 3.10-1** contains definitions of acoustical terminology used in this section. **Table 3.10-2** shows examples of noise sources that correspond to various sound levels.

The Day-Night Average Level (L_{dn}) is based upon the average noise level over a 24-hour day, with a +10 decibel weighting applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. Additional weight is placed on nighttime readings based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment. L_{dn} -based noise standards are commonly used to assess noise effects associated with traffic, railroad, and aircraft noise sources.

TABLE 3.10-1
ACOUSTICAL TERMINOLOGY

Term	Definition
A-weighted	The A-weighted sound level has been shown to correlate with subjective responses and two sounds judged to be of similar loudness would produce similar dB(A) values, although their unweighted dB values would vary considerably. The A-weighting compares well with other noise sources. It is, therefore, the most widely used.
Ambient Noise	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
Attenuation	The reduction of noise.
Decibel or dB	Fundamental unit of sound. A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A decibel is one-tenth of a Bell.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 to 10 p.m.) weighted by a factor of 3 and nighttime hours weighted by a factor of 10 prior to averaging.
L _{dn}	The 24-hour day and night A-weighted noise exposure level that accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night ("penalizing" nighttime noises). Noise between 10:00 p.m. and 7:00 a.m. is weighted (penalized) by adding 10 dBA to take into account the greater annoyance of nighttime noises.
L _{eq}	The equivalent sound level is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The L _{eq} is the constant sound level, which would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).
L _{max}	The highest root-mean-square (RMS) sound level measured over a given period of time.
Source: Beranek, 1998.	

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
- Physiological effects such as hearing loss or sudden startling

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.

TABLE 3.10-2
TYPICAL A-WEIGHTED SOUND LEVELS OF COMMON NOISE SOURCES

Loudness Ratio	Decibels (dBA)	Description
128	130	Threshold of pain.
64	120	Jet aircraft take-off at 100 feet.
32	110	Riveting machine at operator's position.
16	100	Shotgun at 200 feet.
8	90	Bulldozer at 50 feet.
4	80	Diesel locomotive at 300 feet.
2	70	Commercial jet aircraft interior during flight.
1	60	Normal conversation speech at 5 to 10 feet.
1/2	50	Open office background level.
1/4	40	Background level within a residence.
1/8	30	Soft whisper at 2 feet.
1/16	20	Interior of recording studio.

Source: Beranek, 1998.

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 A-weighted 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 it pales in comparison to the health effects 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
- What is music to one is noise to another; the perceived unpleasantness of the sound causes annoyance.

Generally, most noise worldwide is generated by transportation systems, principally motor vehicle noise, but also including aircraft noise and rail noise. Poor urban planning may also give rise to noise pollution. Besides transportation noise, other prominent sources are office equipment, factory machinery, appliances, power tools, lighting hum, and audio entertainment systems.

Stationary point sources of noise, including stationary mobile sources, such as idling vehicles, attenuate (lessen) at a rate of six to nine dBA per doubling of distance from the source, depending on environmental conditions (i.e., atmospheric conditions and noise barriers, either vegetative or manufactured, etc.). Widely distributed noises, such as a large industrial facility spread over many acres or a street with moving vehicles would typically attenuate at a lower rate, approximately four to six dBA.

Sensitive Receptors

Some land uses are considered more sensitive to noise than others due to the amount of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities typically involved. Residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, and parks and other outdoor recreation areas generally are more sensitive to noise than are commercial and industrial land uses. A sensitive receptor is defined as any living entity or aggregate of entities whose comfort, health, or well being could be impaired or endangered by the presence of noise.

3.10.3 EXISTING NOISE LEVELS AND SOURCES

Barstow Site

Sources of Noise

Although the Barstow site is primarily open and undeveloped, several sources of noise are located in the immediate vicinity.

Noise from traffic on I-15 and activities associated with the Tanger Outlet Mall and several retail establishments (fast-food and motels) all contribute to an existing daytime ambient noise level in the area. Night time noise levels are much lower due to reduce traffic volumes on I-15 and a large percentage of businesses in the vicinity of the project site are closed. Based on existing day and night time activity and the proximity of noise sources to the project site, it is estimated that the day/night ambient noise level in the vicinity of the Barstow site is between 55 to 65 Ldn, dBA or approximately 65 CNEL.

Sensitive Receptors

The nearest sensitive receptor is a motel located approximately 600 feet west of the Barstow project site. The nearest residence is located approximately one mile west of the project site, and Lenwood School is located approximately two miles northwest of the project site.

Los Coyotes Site

Sources of Noise

The Los Coyotes site is located within six miles of the unincorporated community of Warner Springs between the Cleveland National Forest and the Anza-Borrego Desert State Park, east of Mount Palomar. The area is isolated from major noise sources and the only existing noise source of significance is local activity. Based on the existing traffic volumes on Camino San Ignacio Road, noise levels in the area are an average of about 35 to 45 dBA, which is typical of rural environments. Nighttime noise levels are about 10 decibels lower.

Sensitive Receptors

There are no off-reservation noise receptors within three miles of the project site. Remaining land in the vicinity is undeveloped.

3.11 HAZARDOUS MATERIALS

This section describes the existing environmental conditions for the proposed Barstow and Los Coyotes sites. The general and site-specific profiles relating to hazardous materials contained herein provide the environmental baseline by which direct, indirect, and cumulative environmental effects are identified and measured in **Chapter 4.0**.

3.11.1 IDENTIFICATION OF HAZARDOUS MATERIALS

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. A Phase I Environmental Site Assessment (ESA) is used to identify Recognized Environmental Conditions (RECs) on a particular site. REC refers to the presence or likely presence of conditions on a property that indicate an existing release, a past release, or a material threat of release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. This includes hazardous substances and petroleum products, even under conditions in compliance with laws. A Phase I ESA was conducted in accordance with Bureau of Indian Affairs (BIA) guidelines and the American Society for Testing and Materials (ASTM) Standard Practice E 1527-00 for the Barstow site (**Appendix J**).

The ESA includes review of federal and state regulatory agency records and databases, interviews with local officials and property owners, site inspection and aerial photography review. Such an assessment is a requirement of the Department of the Interior to avoid financial liability for cleanup of contaminants under the Comprehensive Environmental Response, Compensation on Liability Act (CERCLA) 42 U.S.C.A. Section 9607A. Regulatory agency databases are searched for records of known storage tank sites and known sites of hazardous materials generation, storage, or contamination, or where violations pertaining to storage and/or use of hazardous materials have occurred. Sites and listings up to two miles from a point roughly at the center of project site are included in the search.

Environmental database review for the project alternatives was accomplished using the services of a computerized search firm, Environmental Data Resources, Inc. (EDR). EDR reports for the Barstow and Los Coyotes sites are in **Appendix K**. EDR uses a geographical information system to plot locations of past and/or current hazardous materials involvement. The scope of the regulatory information search conducted for the sites included but was not limited to the following databases:

- Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) – Identifies sites United States Environmental Protection Agency (USEPA) is currently investigating for the release or threatened release of hazardous substances pursuant to the CERCLA of 1980.
- The National Priority List (NPL) – Identifies abandoned or uncontrolled hazardous waste sites identified by the USEPA for priority remedial action under the Federal Superfund Program.
- Resource Conservation and Recovery Act (RCRA) – Identifies registered hazardous waste generators, transporters, treatment, storage, and disposal facilities in the vicinity of the study area. The databases maintained under this Act include:

- Generators and Violators List (RCRA-G)
- Large Quantity Generators (RCRA-LQG)
- Small Quantity Generators (RCRA-SQG)
- RCRA Corrective Actions List (CORRACT)
- RCRA Treatment, Storage, or Disposal List (RCRATSD)
- Emergency Response Notification System (ERNS) database – Identifies USEPA documented releases of oil and hazardous substances. This database was reviewed to determine whether past spill events have occurred in the study area.
- US BROWNFIELDS database – Identifies USEPA documented properties which have been complicated by the presence or potential presence of hazardous substance, pollutant, or contaminant and safely clean up the area.
- Hazardous Materials Information Reporting System (HMIRS) – Identifies reported hazardous material spill incidents reported to DOT.
- Facility Index System/Facility Registry System (FINDS) – Identifies any criminal enforcement actions for all environmental statutes.
- ENVIROSTOR– Identifies potential or confirmed hazardous substance release properties.
- Leaking Underground Storage Tank (LUST) – Identifies reported leaking underground storage tank incidents.
- Underground Storage Tank (UST) – Identifies active UST facilities gathered from local regulatory agencies.
- Hazardous Substance Storage Container Database (HIST UST) – Identifies historical listings of UST sites.
- California Hazardous Material Incident Report System (CHMIRS) – Identifies information on reported hazardous material incidents (accidental releases or spills).
- Facility Inventory Database (CA FID UST) – Identifies historical listings of active and inactive underground storage tank locations from the State Water Resource Control Board.
- Indian UST List – Identifies USTs registered on Indian Land.
- Indian LUST – Identifies leaking underground storage tanks on Indian Land.
- Solid Waste Facilities Database (SWF/LF) – Identifies solid waste disposal facilities registered and tracked by the state. The facilities tracked include solid waste disposal sites as well as transfer and processing stations.
- Inactive Solid Waste Facilities (HIST LF) – Contains historical information of the location of abandoned landfills and solid waste disposal sites.

Each site was evaluated for visible signs of current or historic hazardous materials involvement on or in the vicinity of the site. Signs of possible hazardous materials involvement would include any indications of underground storage tanks existing on the site; stained soils and/or unusual odors originating from the site; indications of an excavation or removal of soils, including patched asphalt and large debris piles; and other obvious signs.

3.11.2 EXISTING CONDITIONS

Barstow Site

Descriptions of the land in the vicinity of the Barstow site are as follows: to the south is undeveloped

land, to the east is the Stoddard Valley Off-Highway Vehicle (OHV) area, to the north and west are commercially developed areas surrounding the Interstate-15/Lenwood Road interchange. Businesses in the vicinity include two outlet malls, restaurants, and hotels. Telephone inquiries were made to various agencies including the local fire department and the Regional Water Quality Control Board (RWQCB) as part of the ESA. No outstanding open environmental cases with local, state, or federal regulatory agencies for the site were identified, and no reported sites in the vicinity of the Barstow site were found to be currently under remediation. A Phase I ESA conducted in accordance with the *ASTM Standard E 1527, Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* was prepared for the Barstow site (Merrell Engineering Co., 2003). As a result, the Phase I ESA concluded that no RECs exist on the Barstow site and no further studies were warranted. The Phase I ESA will be updated prior to the land being taken into trust. The Department of the Interior Policy 602 DM2 requires that a Phase I assessment be no more than 6 months old at the time of the trust acquisition. The update is required to ensure that no changes have occurred regarding the presence of hazardous material since the Phase I ESA documenting the original conditions on the site (**Appendix J**).

Additional site reconnaissance conducted on May 3 and 4, 2006 confirmed that the Barstow site is undeveloped with the exception of concrete and asphalt fragments as well as structural debris. None of these remains (ferrous metal, plastics, modern window glass, electrical wire) are hazardous materials. There were no stained soils, strong chemical odors, or other signs of hazardous materials present during the site visit.

An updated database report for the Barstow site was reviewed in March 2006 (EDR, 2006a) and February 2009 (EDR, 2009a). The Barstow site was not listed on federal or state regulatory agency databases that were searched by EDR. The EDR report listed one site in the vicinity of the Barstow site. A Chevron Station was listed on the CA FID UST and HIST UST databases due to the presence of two 10,000-gallon USTs one 5,000-gallon UST containing gasoline and one 1,000-gallon UST containing waste oils. Based on the current regulatory status and lack of violations reported, this site is not considered to represent a likely past, present, or material threat of release on the Barstow site (**Appendix K**).

Los Coyotes Site

The Los Coyotes site is located on undeveloped Tribal land situated on an interior portion of the Reservation. A site visit in May 2006 revealed no visual indications of stained soils, unauthorized dumping, petrochemical storage, or other hazardous materials involvement on the site. Areas adjacent to the project site are also undeveloped.

Observations made during the May 2006 site visit of surrounding properties revealed no threat to the environment quality of the Los Coyotes site. AES reviewed an updated database report for the Los Coyotes site in April 2006 (EDR, 2006b) and February 2009 (EDR, 2009b). The Los Coyotes site was not listed on any regulatory agency database that was searched by EDR. There were no adjacent sites listed with hazardous materials releases that would affect the surface and subsurface conditions on the Los Coyotes site (**Appendix K**).

3.12 AESTHETICS

This section describes the existing environmental conditions for the proposed Barstow and Los Coyotes sites. The general and site-specific profiles of aesthetics contained herein provide the environmental baseline by which direct, indirect, and cumulative environmental effects are identified and measured in **Chapter 4.0**.

3.12.1 VIEWSHED CHARACTERISTICS

A viewshed comprises one or more viewing corridors, or vistas. Each vista provides a line-of-sight that can be characterized uniquely from among other vistas within the viewshed. The following constituent elements compose the visual experience within each vista:

- 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.
- 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.

3.12.2 BARSTOW SITE

Local Plans and Ordinances

Development in the area of the Barstow site is guided in part by the Lenwood Specific Plan (LSP). Components of the plan relevant to the topic of aesthetics include landscaping, building height, lighting, and signage. With regard to landscaping, the LSP seeks to create a sense of project identity throughout the area (City of Barstow, 1988). Specific requirements include using undulating berms and ground covers, as well as planting trees of similar species. Light fixtures are limited to 30 feet high, and are prohibited from extending above the roofline of the building. According to the LSP, lighting must be designed to confine direct rays to the premises. Types of signage prohibited by the LSP include roof signs, flashing signs, and animated signs. Signs are not to exceed 150 square feet, and must not extend above the roofline of the building. The name of the business shall be the dominant message on the sign, and the sign must be architecturally compatible with the building.

Barstow Site Viewshed

The Barstow site lies on the outskirts of the visually developed area of the City. The topography surrounding the Barstow site inclines immediately to the northeast and to the southwest, across I-15 from the site. Upland areas also occur further south, but not in the immediate viewing area of the Barstow site. Residential areas are located approximately 2 miles northwest and approximately 1.5 miles northeast of the Barstow site. The residential area to the northeast has no view to the Barstow site as topographical features occlude these views. A partial view of the Barstow site and vicinity is afforded to a limited number of residences northwest of the site. These residences are situated on or near Main Street, in or southwest of the community of Lenwood. From the Barstow site, they are located approximately 1.8 to 3.5 miles away, in an approximately west to northwest direction. The view of the Barstow site from these residences is obscured by the two outlet malls and other commercial and retail development adjacent to the site. Other views come from surface streets in the vicinity and from I-15, which passes the Barstow site to the west and northwest.

Scenic Highways

There are no state- or county-designated scenic highways or roads adjacent to the Barstow site. The portion of I-15 extending from State Route 58 near Barstow to State Route 127 near Baker, California is eligible for designation as a State Scenic Highway (Caltrans, 2007).

3.12.3 LOS COYOTES SITE

Local Plans and Ordinances

The Los Coyotes site is located on land that is held in trust by the United States and is therefore not subject to any local or regional land use regulations of San Diego County. The Los Coyotes Tribal Council has jurisdictional authority over aesthetic matters within the Los Coyotes Reservation.

Los Coyotes Site Viewshed

The region surrounding the Los Coyotes site is generally mountainous, and it is this formation that frames the project area viewshed within its valley environment. The valley itself shapes the course of the San Ysidro Creek, which generally flows north to south adjacent to the western boundary of the Los Coyotes site. At the site, the valley floor is essentially flat and level. Oak and pine woodlands occludes the view of the site from up the valley. Likewise, the view from down the valley is occluded by groups of trees, primarily oak and pine, which traverse the valley.

The Los Coyotes site is visible from adjacent hills; from Camino San Ignacio Road, which is a dirt road that provides primary access through the area; and from Kupanil Road, which runs generally north-south atop a ridgeline formed by the mountains immediately to the east. The site is not visible from locations outside the Los Coyotes Reservation.

Scenic Highways

There are no state- or county-designated scenic highways or roads in the vicinity of the Los Coyotes site. A portion of I-15, extending from State Route 76 State Route 91 is eligible for designation as a State Scenic Highway (Caltrans, 2007).