SECTION 3.0

AFFECTED ENVIRONMENT

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AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This section describes the existing environment of the area that may be affected by the Proposed Project or alternatives as required by CEQ Guidelines (40 C.F.R. § 1502.15). Resources that are described include Land Resources, Water Resources, Air Quality, Biological Resources, Cultural Resources, Socioeconomic Conditions, Resource Use Patterns, and other values including Noise and Hazardous Materials.

3.2 LAND RESOURCES

This section describes the topography, soils, geology, seismicity, and mineral resources at the Madera and North Fork sites and in the Madera County region.

3.2.1 GENERAL ISSUES

GEOLOGICAL SETTING

Madera County's geological profile includes portions of two geological provinces, the "Great Valley Province" and the "Sierra Nevada Province." The Great Valley Province consists of the San Joaquin and Sacramento Valleys, and is approximately 435 miles in length along its north-south axis, and approximately 93 miles wide along its east-west axis. Its north-south axis is bounded by the Klamath Mountains to the north and the Transverse Ranges to the south. The province's east-west axis is bounded by the Sierra Nevada Province, consisting of the Sierra Nevada Mountains to the east, and the Coast Ranges to the west.

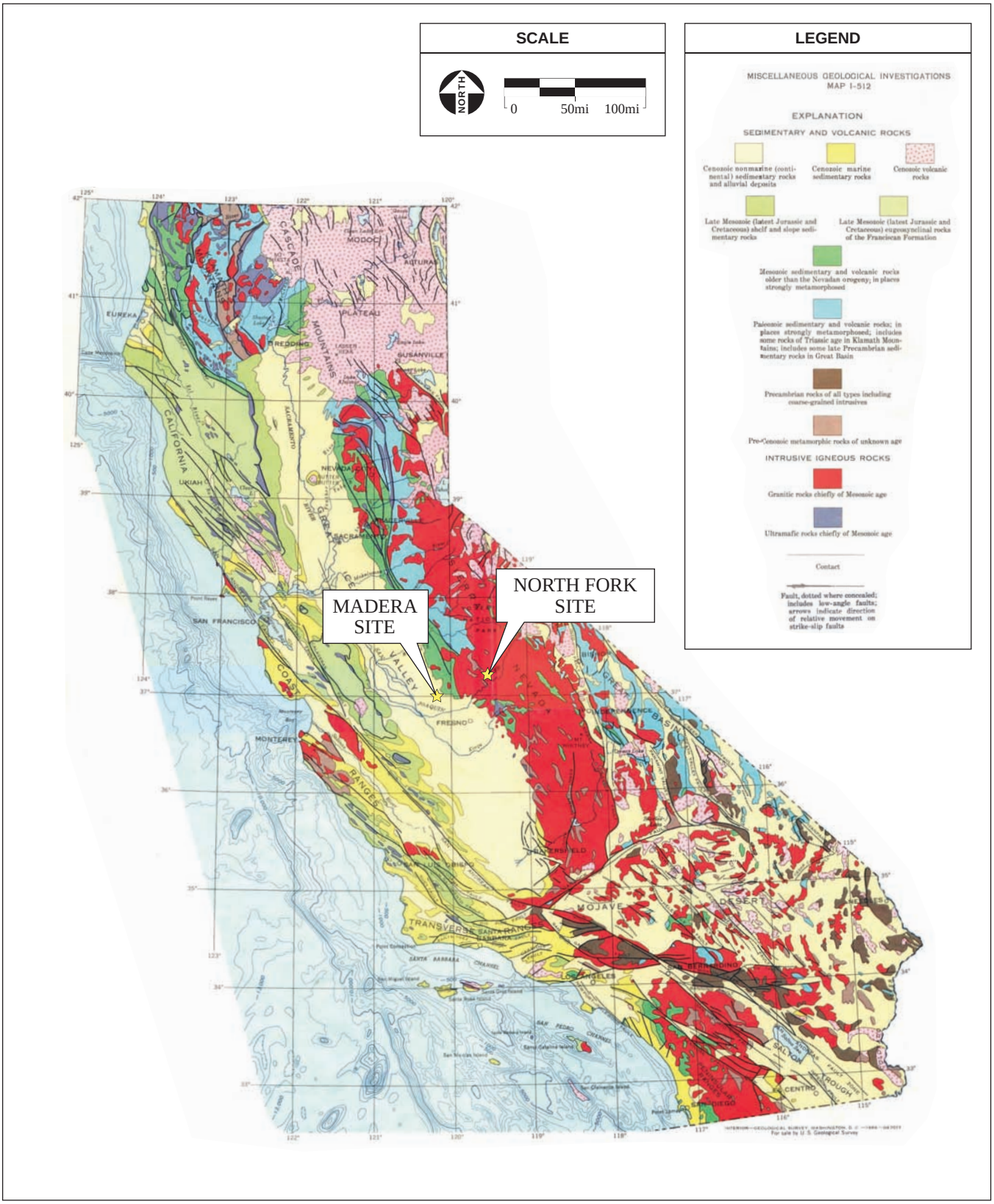
The Sierra Nevada portion of Madera County is shown in **Figure 3.2-1** to be composed primarily of granitic rock structures of Mesozoic age. The intermediate area, shaded in green, is identified as Mesozoic age sedimentary and volcanic rock structures, in some places strongly metamorphosed. Rock formations in western Madera County, in the Great Valley Province, are shown as sedimentary rock and alluvial deposits of Cenozoic age (approximately 65 million years ago to the present). Further discussion on geology appears under the ***Paleontological Resources*** heading in **Section 3.6**. Site-specific discussion on geology appears below.

MADERA COUNTY TOPOGRAPHY

A color shaded relief map of the region including and around Madera County appears in **Figure 3.2-2**. The topographical profile of Madera County is characterized as elevated in the Sierra Nevada Province to the east, and lower in its western portion, which lies within the San Joaquin Valley. The highest point in Madera County is found at Mt. Ritter (13,157 feet) among the Sierra Nevada Mountains and in the northeast, near Madera County's border with Mono County. In this portion of the County, the elevation varies greatly, owing to the peak-and-saddle topography of the Sierra Nevada Mountains. The lowest elevations in Madera County are found in the western portion, with elevations of 115 feet found along the border with Merced County, at the town of Dos Palos. Site-specific discussion on topography appears below.

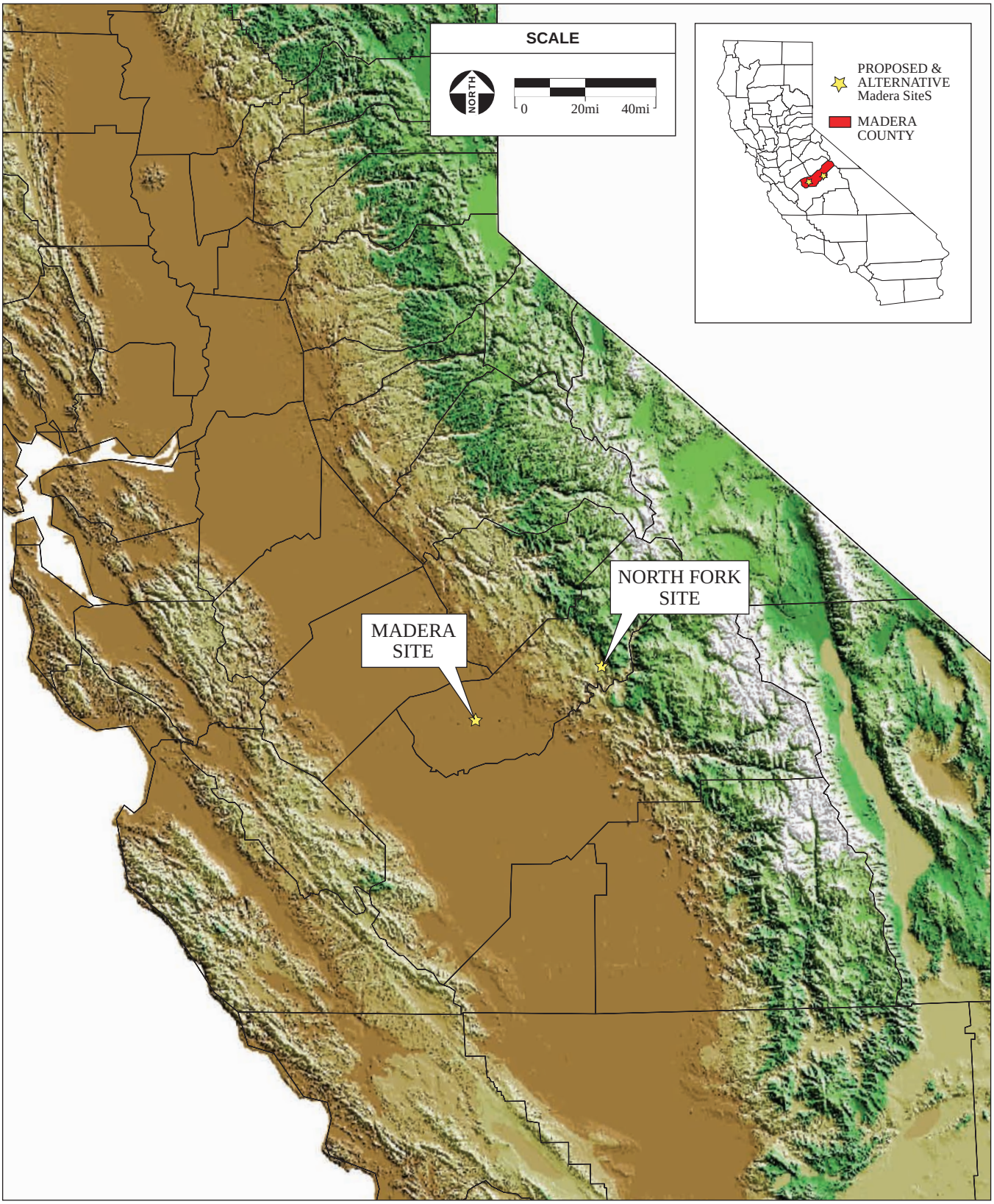
MADERA COUNTY SOILS

The ground surface of the Great Valley province was formed by long-term deposition of sediments, from the late Mesozoic era (approximately 150 million years ago) and the Cenozoic era, originating in many locales from the Sierra Nevada Province to the east. The result is a



SOURCE: Department of Interior U.S. Geological Survey, 1966; AES, 2006

Figure 3.2-1
Central California Geological Profile



SOURCE: ESRI Data; AES, 2006

Figure 3.2-2
Madera County Topography – Color Shaded Relief

variety of soil types and provenances. Older alluvial deposits are sometimes exposed on the eastern edge of the Great Valley province. In this area, older river channels marked by fluvial debris had become covered with other sediments or igneous and pyroclastic materials, derived from volcanic processes. Soils in the Sierra Nevada Province and the foothills are generally shallower, with common outcroppings of granitic rocks. Because of the iron content of the mafic parent rocks, soils in the Sierra Nevada Province are reddish in color in many areas. Site-specific discussion on soils appears below.

SEISMICITY

Seismic Intensity: The Modified Mercalli Intensity Scale

The Modified Mercalli Intensity (MMI) scale (**Table 3.2-1**) 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), and intensities ranging from IV to X could cause moderate to significant structural damage. The damage level represents the estimated overall level of damage that will occur for various MMI intensity levels. The damage, however, will not be uniform. Some buildings will experience substantially more damage than this overall level, and others will experience substantially less damage. Not all buildings perform identically in an earthquake. The age, material, type, method of construction, size, and shape of a building all affect its performance. Maximum peak ground acceleration intensities at the site are expected to cause MMI (VII) ground shaking. Ground shaking effects of this intensity include moderate structural damage to ordinary buildings, but negligible damage to buildings of good design and construction.

Magnitude

On a Richter Scale, the magnitude of an earthquake is determined from the logarithm of the amplitude of waves recorded by seismographs. Adjustments are included for the variation in the distance between the various seismographs and the epicenter of the earthquakes. Magnitude is expressed in whole numbers and decimal fractions. For example, a magnitude 5.3 might be computed for a moderate earthquake, and a strong earthquake might be rated as magnitude 6.3. Because of the logarithmic basis of the scale, each whole number increase in magnitude represents a tenfold increase in measured amplitude; as an estimate of energy, each whole number step in the magnitude scale corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number value.

Earthquakes with magnitude of about 2.0 or less are usually called microearthquakes; they are not commonly felt by people and are generally recorded only on local seismographs. Events with magnitudes of about 4.5 or greater are strong enough to be recorded by sensitive seismographs all over the world. Great earthquakes, such as the 1964 Good Friday earthquake in Alaska, have magnitudes of 8.0 or higher. The Richter scale is not used to express damage.

TABLE 3.2-1
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, Bruce A., *Earthquakes*, W. H. Freeman and Company, New York, 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 ground water is within a depth of 50 feet or less, and submerged loose, fine sands occur within that depth. Liquefaction potential decreases with increasing grain size and clay and gravel content, but increases with increasing ground acceleration and duration of shaking.

3.2.2 MADERA SITE

TOPOGRAPHY

The Madera site is situated within the Great Valley Province; its mean elevation is 252 feet above sea level, with localized elevations ranging between 242 and 261 across the surface of the entire site. There are minor slopes resulting from the differences in elevation, however most of the ground surface is flat. An artificial drainage ditch, known as the Airport Ditch, lines the western boundary of the Madera site. A creek bed enters the Madera site from the southeast quadrant, and is channeled through the middle of the southern half of the Madera site. The channel proceeds directly west until it runs off site. There are no other remarkable topographical features on the Madera site.

SOILS

Madera County Soil Survey

The Natural Resource Conservation Service (NRCS) soil survey for Madera County (1990) identifies and plots soil units, and provides a summary of major physical characteristics for each unit for management considerations. In the land capability classification system used by the NRCS, soils are grouped by Soils Capability Class. A Soils Capability Class indicates limitations for practical use for food, fiber, or forage production. Classes are designated by Roman numerals I through VIII, with additional coding by subclass indicated by lower case letters. Class I is the least restricted with Class VIII being severely limited and nearly precluded from use for commercial crop production. Prime soils are those located on land which has a combination of physical and chemical characteristics best suited to produce forage, feed, food, and other crops. Soils Capability Class I and II soils form prime crop and pasture land, which, under provisions of the Farmland Protection Policy Act of 1980 (FPPA), must be evaluated in implementation of the National Environmental Policy Act (NEPA) for potential environmental effects if they are to be used for non-agricultural development. Further discussion related to the FPPA appears in **Section 3.8.3**.

The Land Capability Classification System is broken down into capability classes, subclasses and units, as applicable to the site. The Land Capability Classification System reflects a degree of limitation on soils for the suitability of most kinds of field crops. The soils in one capability unit are similar enough to require like constraints and management planning.

Madera Site Soils

The Madera site consists of the soils shown on **Table 3.2-2**. The spatial distribution of these soils is shown on **Figure 3.2-3**. San Joaquin sandy loam (SaA) soils constitute the majority of soils on the Madera site. Areas of Atwater loamy sand, Hanford sandy loam, and Tujunga sandy loam are also present on the site. The San Joaquin, Atwater, and Hanford soils are all underlain by hardpans, while the Tujunga soil is associated with former and current drainages and swales. All of the soils listed are identified as alluvial deposits.

Alamo series soils are generally poorly drained clays that overlie an iron-silica hardpan. The parent materials are mainly derived from granitic materials. Soils bearing the AsA symbol are typically associated with San Joaquin and Madera soils, usually in small areas. These soils are variable in depth, with poor drainage and very slow internal drainage. The erosion hazard of these soils is severe, with a moderate available water capacity. Runoff usually becomes ponded.

Soils of the Atwater series are well drained, and typically very deep, and are derived from parent materials comprising older granitic alluvium. Soil under the AwA symbol is moderately deep to deep over hardpan and well drained, with rapid internal drainage. Erosion hazard is severe, with a moderate available water capacity and very slow runoff.

Hanford series soils are generally textured, young alluvium derived from granitic materials with a high micaceous content; that is, containing high aluminum-silica compounds. Soils under the HfA symbol are moderately deep and well drained, with rapid internal drainage. The available water capacity of these soils is low. Erosion hazard is low, with moderately rapid runoff characteristics. Soils under the HgA symbol are shallow and well drained, with rapid internal drainage. Erosion hazard is slight, with a low available water capacity. Runoff characteristics are moderately rapid.

Soils of the Pachappa series are characteristic of alluvial fans mainly comprising older granitic alluvium. PaA soils are very deep, with good drainage and medium internal drainage. Erosion hazard is slight, with a moderate available water capacity. Runoff is very slow.

San Joaquin series soils are basically shallow hardpan consisting of micaceous materials derived from granitic rocks. SaA soils are shallow, with good external drainage and slow internal drainage. Erosion hazard is slight, with a low available water capacity. Runoff is slow, and in

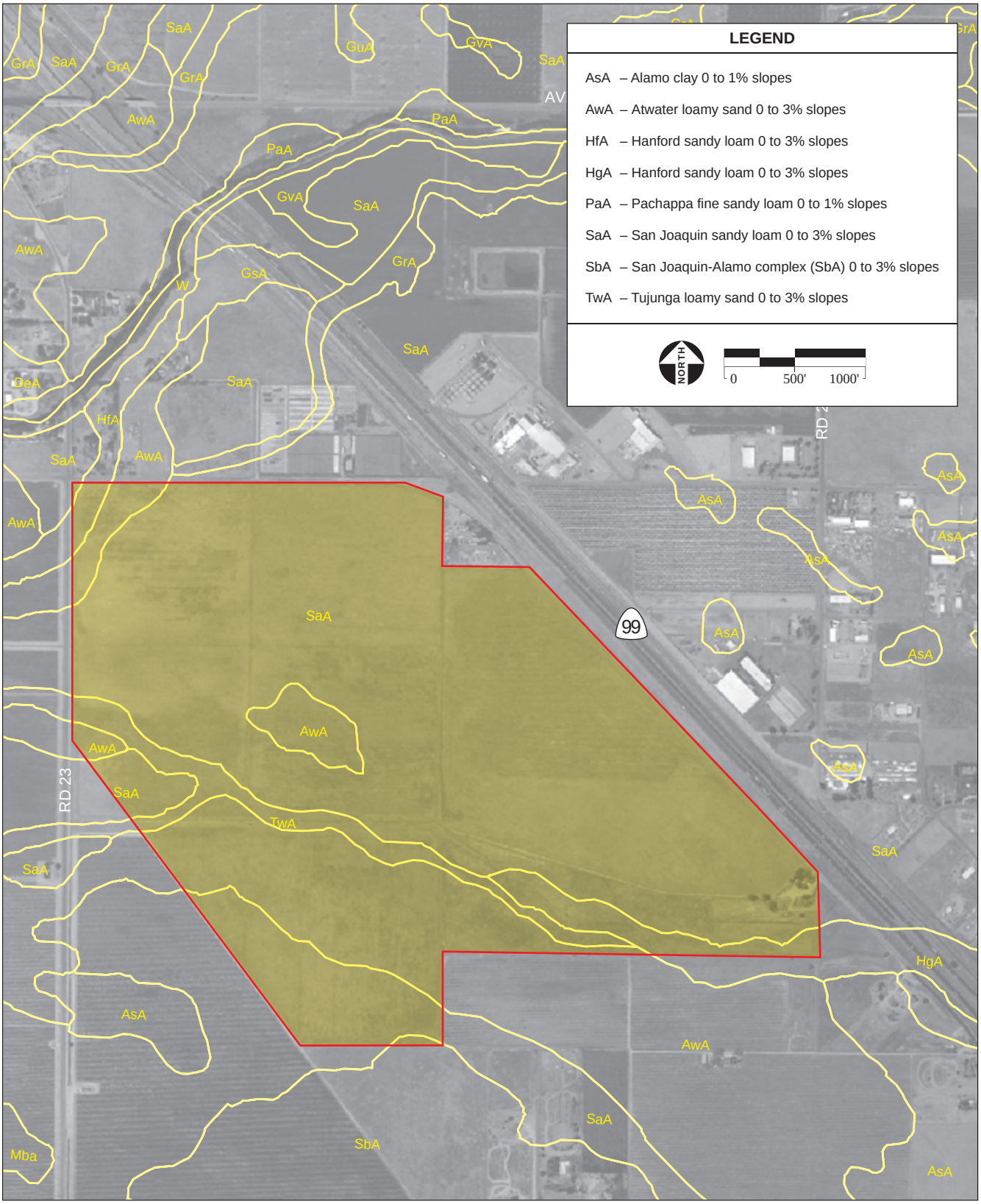
some places very slow. Soils in the San Joaquin-Alamo complex (SbA) differ in that they are variable in depth, with poor drainage and very slow internal drainage. While there is no erosion hazard, the available water capacity is moderate, and runoff is often ponded.

TABLE 3.2-2
SOIL LIMITATIONS

Soils	Depth	Drainage	Internal Drainage	Erosion	Available Water Capacity	Runoff	Storie Index Rating	Capability Subclass
Alamo clay (AsA) 0 to 1% slopes	Variable	Poor	Very slow	None	Moderate	Ponded	13	IIIW-5
Atwater loamy sand (AwA) 0 to 3% slopes	Variable	Well drained	Moderately rapid	Severe	Moderate	Very slow	76	IIIe-4
Hanford sandy loam (HfA) 0 to 3% slopes	Moderately deep	Well drained	Rapid	Slight	Low	Moderately rapid	95	I-1
Hanford sandy loam (HgA) 0 to 3% slopes	Shallow	Well drained	Rapid	Slight	Low	Moderately rapid	67	IIIs-3
Pachappa fine sandy loam (PaA) 0 to 1% slopes	Very deep	Good	Medium	Slight	Moderate	Very slow	95	I-1
San Joaquin sandy loam (SaA) 0 to 3% slopes	Shallow	Good	Slow	Slight	Low	Slow to very slow	27	IVs-3
San Joaquin-Alamo complex (SbA) 0 to 3% slopes	Variable	Poor	Very slow	None	Moderate	Ponded	17	IVs-3
Tujunga loamy sand (TwA) 0 to 3% slopes	Moderate	Somewhat excessive	Very rapid	Severe	Low	Very slow	56	IIIe-4

NOTE: Capability Class: Class I soils are considered to be very good for crops, with few limitations; Class III soils have severe limitations that reduce the choice of plants, that require special conservation practices, or both; Class IV soils have very severe limitations that can restrict the choice of plants or require very careful management.

SOURCE: NRCS 1990 Madera County Soil Survey; AES 2005.



SOURCE: U.S. Dept. of Agriculture, Natural Resources Conservation Service; AES, 2006

Figure 3.2-3
Madera Site Soils

Tujunga series soils are derived from granitic alluvium. Soils under the TwA symbol are moderately deep, with somewhat excessive drainage. Internal drainage is very rapid, and there is a severe erosion hazard. The available water capacity of these soils is low. Runoff is very slow.

Madera Site Seismicity

The nearest seismic hazard is the San Andreas Fault, which is approximately 40 miles southwest of the Madera site, affecting the overall seismic risk factor for Madera County. **Figure 3.2-4** shows the seismic hazards associated with the region in and around Madera County. The Madera site is shown by the United States Geological Survey (USGS) to lie within an area considered subject to 0.2g to 0.3g maximum peak acceleration, with a 2 percent chance of exceedance in 50 years. On **Table 3.2-1** above, the Modified Mercalli Intensity Scale value assigned to such an event would be VIII. The description provided lists the following conditions: 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 and walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes occur in well water. Persons driving motorcars disturbed.

MINERAL RESOURCES

No mineral resources are known to exist on the Madera site. No mineral extraction or other mining activities take place on or in the vicinity of the Madera site.

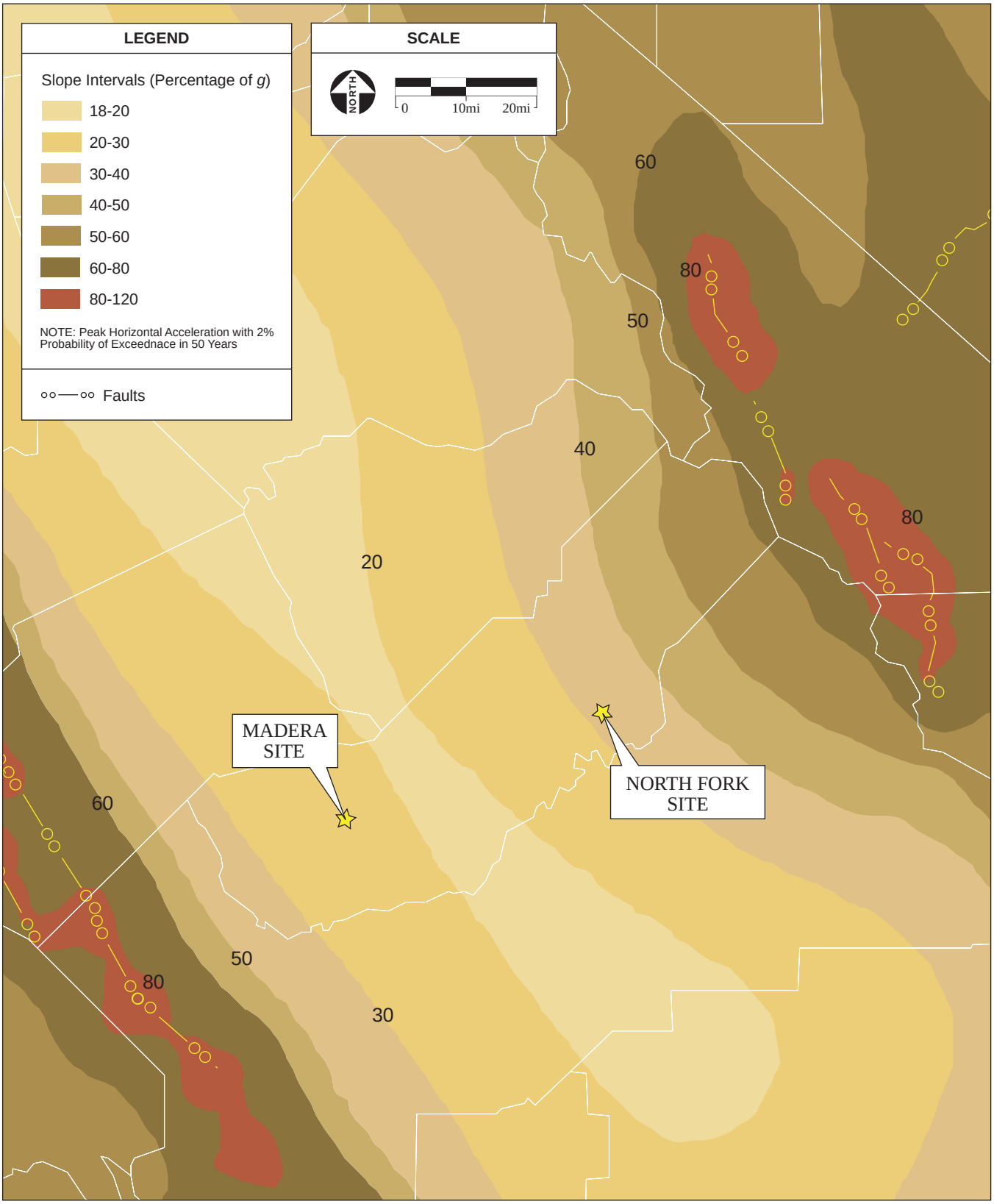
3.2.3 NORTH FORK SITE

TOPOGRAPHY

The North Fork Rancheria is located in the Sierra Nevada Geomorphic Province. Its maximum elevation is 3,340 ft in the northeast corner, while its minimum elevation is 2,860 ft in the southwest corner, resulting in a slope of approximately 17% from the northeast to southwest corners.

SOILS

The soils of the North Fork site are unmapped by the NRCS. The nearest regional soils to the North Fork Rancheria have been identified as belonging to the Holland-Tollhouse association. Holland series soils are developed from coarse-grained granitic rocks, and are grayish-brown and reddish-brown in color. These soils are found at altitudes comparable to the North Fork site. Tollhouse soils are typically shallow, and are also derived from weathered granitic rocks. Topography generally ranges from hilly to very steep for soils in this association. Rock outcroppings are common in Tollhouse soil areas, though no such outcroppings were observed on the North Fork site. The Holland soils are deep, whereas the Tollhouse soils are generally shallow, and found on sharper inclines.



SOURCE: USGS National Seismic Hazard Map, 1996; AES, 2006

Figure 3.2-4
Madera County Seismic Hazard Map

PROJECT AREA SEISMICITY

Figure 3.2-4 shows the seismic hazards associated with the region in and around Madera County. The North Fork Rancheria is approximately 80 miles northeast of the San Andreas Fault, with the continued uplift of intrusive igneous matter creating another fault system approximately six miles to the northeast. The North Fork site is shown by the USGS to lie within an area considered subject to 0.3g to 0.4g maximum peak acceleration, with a 2 percent chance of exceedance in 50 years. On **Table 3.2-1** above, the Modified Mercalli Intensity Scale value assigned to such an event would be between VIII and IX. The description provided lists the following conditions in a seismic event with an intensity value of 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.

MINERAL RESOURCES

Historical records indicate extensive gold mining in the eastern Madera County town of Coarsegold. While some mining operations continue for the extraction of other mineral resources in the area, there is no known mineral resources contained on the North Fork site and no mining activity has taken place on the site.

3.3 WATER RESOURCES

This section addresses the existing water resources of the Madera County region, the Madera site and the North Fork site. Issues discussed in this section include a description of associated watersheds, existing runoff from the Madera and North Fork sites, the potential for flooding, and a characterization of surface and groundwater features and quality. Other sections of this document also address water resources. **Section 3.5** *Biological Resources* provides a detailed characterization and map of the streams and wetlands on the Madera and North Fork sites. **Section 3.9** *Public Services* describes the water supply for the City of Madera and groundwater wells on and near the Madera and North Fork sites. **Section 3.9** also provides details on existing water supply facilities, and regulatory requirements for wastewater treatment and disposal.

3.3.1 SURFACE WATER, DRAINAGE, AND FLOODING

REGIONAL SETTING

The topography of Madera County is composed of flat to moderately sloped alluvial fans and plains. Precipitation varies from year to year, but averages 11 to 12 inches annually. Most precipitation falls as rain in the winter, with a 25 year, 24 hour precipitation rainfall event of about 2.1 inches [Western Regional Climate Center (WRCC), 2005a] and a 100 year, 24 hour precipitation rainfall event of about 2.4 inches (WRCC, 2005b). The annual average evapotranspiration in the Madera region is 57.9 inches, with the highest evapotranspiration rates occurring during the summer months. Stream flow is dominated by precipitation and snowmelt in the Sierra Nevada. Dams and reservoirs regulate major streams and rivers, and water is diverted for irrigation.

Regionally, Madera County is located entirely within the San Joaquin River Hydrological Drainage Basin, the boundaries of which are formed by the ridgelines of the Sierra Nevada, the Tehachapi, and the Coast Ranges. The San Joaquin Drainage Basin covers an area over 10 million acres and includes all tributary watersheds for the San Joaquin River and the Delta south of the Sacramento River. Principal streams and larger tributaries in Madera County are the San Joaquin, Fresno, and Chowchilla Rivers. Runoff from the City of Madera is drained from east to west by several small rivers and streams, which are tributaries to Dry Creek. Dry Creek flows west from the City of Madera where it drains into the Fresno River and the Chowchilla River from the North. These rivers run parallel to each other and flow westward into the San Joaquin River. The San Joaquin River originates in the Sierra Nevada at an elevation over 10,000 feet above mean sea level (amsl) and enters the San Joaquin Valley near Friant. Below Friant Dam, the river flows west to the center of the valley, turns sharply north at Mendota Pool and flows through the valley to the Delta. Along the valley floor, the San Joaquin River receives flow from

the Merced, Tuolomne, and Stanislaus rivers, and from smaller tributaries draining the east and west sides of the valley.

Madera County has experienced flooding on an average of every nine years since 1861; however, the construction of Hidden and Buchanan Dams in 1975 eliminated major flood concerns in the County. Flooding in Madera County can occur as a result of heavy rains, dam failure, excessive snowmelt and runoff, levee failure, and localized drainage problems. Principal flood problems, as identified in a Flood Insurance Study completed by the Federal Emergency Management Agency (FEMA) in 1987, lie along Cottonwood, Root, Dry, and Schmidt Creeks, and the Schmidt Creek Tributary (Madera County, 1995b). All have perennial flow, and all of the channels are poorly defined and subject to flooding. The most recent flooding occurred in January of 1993, in which parts of Madera County experienced flooding and soil erosion along the Fresno River and its tributaries. The construction of Buchanan, Hidden, and Friant dams, as well as levee improvements along the sloughs and rivers, have eliminated major flooding problems along the San Joaquin, Fresno, and Chowchilla Rivers.

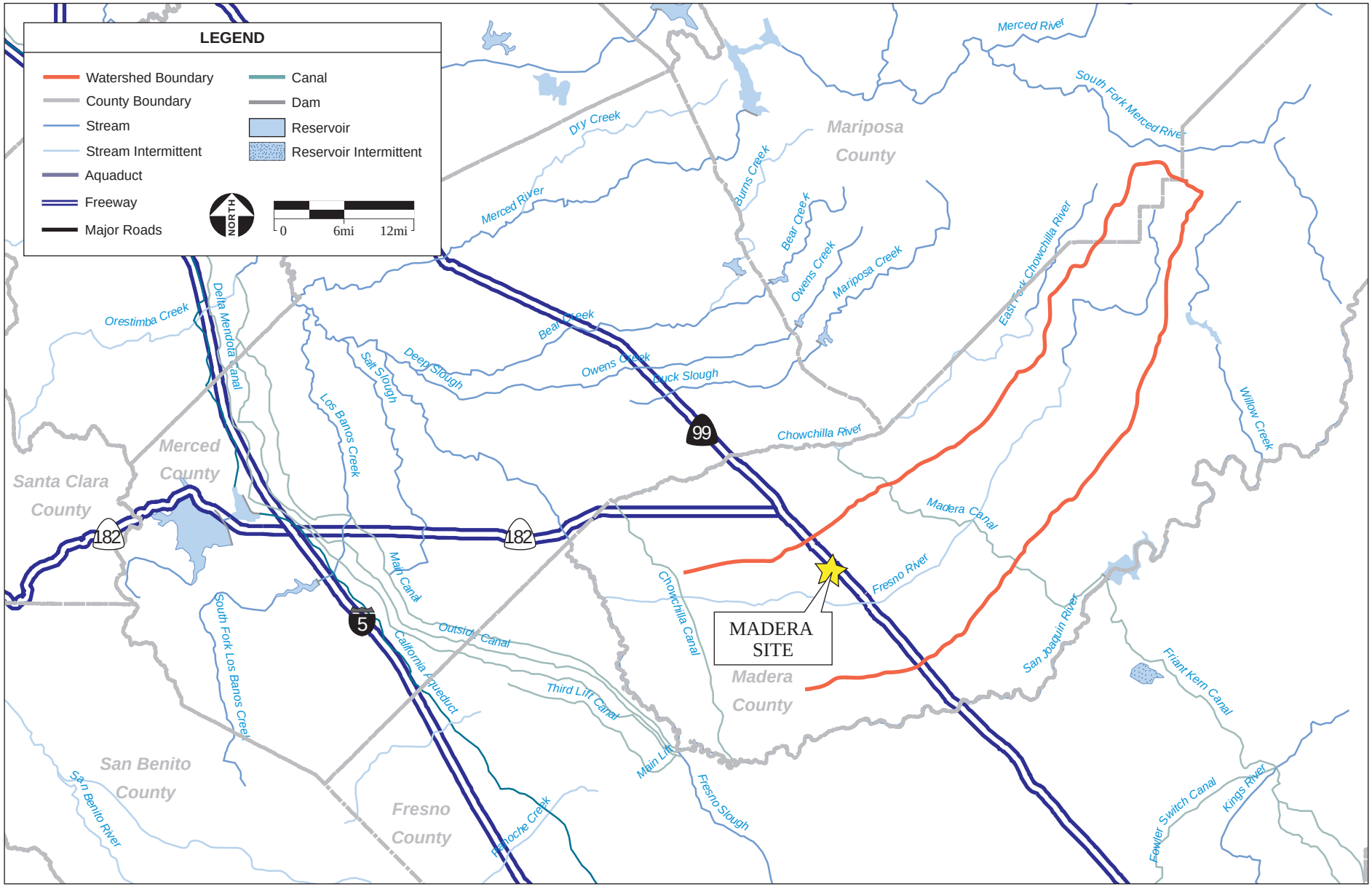
MADERA SITE

Watershed

The Madera site lies within the Middle San Joaquin-Lower Chowchilla River Basin [United States Geologic Survey (USGS) Hydrologic Unit Catalog (HUC) No. 18040001], which includes the lower portions of the Chowchilla and Fresno Rivers (**Figure 3.3-1**). The Madera site lies approximately 2.25 miles north of the Fresno River, and less than 0.25 mile south of Dry Creek. Schmidt Creek is an ephemeral stream, flowing onto the Madera site along its eastern boundary. This stream is now channelized across the Madera site. Airport Ditch, a canal operated by Madera Irrigation District, runs along the western site boundary.

Drainage

The existing topography of the Madera site is relatively flat. The site slopes from its easterly boundary to Road 23 passing through the property at an average slope of 0.1 percent. Schmidt Creek flows westerly through the site from State Highway 99 to Road 23 and into Dry Creek. Existing storm runoff from the site sheet flows into tributary ditches of Schmidt Creek then to Dry Creek, then to the Fresno River. Schmidt Creek Ditch is a realigned channel of Schmidt Creek that was historically within a shallow swale of the site and flowed to the west according to the USGS "Kismet, CA" 7.5 Minute Topographic Quadrangle map. An irrigation canal (Airport Ditch) parallels Road 23 along the western edge of the property; however, it is not hydrologically connected with the Schmidt Creek Ditch (H. T. Harvey & Associates, 2004; **Appendix K**).



SOURCE: UC Davis ICEMAPS, 2005; AES, 2006

Figure 3.3-1
Fresno River Watershed Map

Floodplain

Schmidt Creek is the nearest water body that may cause potential flooding problems on the Madera site. The Madera site is currently situated within the boundaries of a delineated special flood hazard inundation zone as shown on the FEMA Flood Insurance Rate Maps (FIRM), panel numbers 0601700605B and 0601700600B (FEMA, 1987). The specific inundation zone is "Zone AO," which represents an area of "100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet." In addition, oral interviews with the current land tenant who has lived on site for 10 years indicates that the Madera site floods often during the winter months (Flower, pers. communication, 2005). **Figure 3.3-2** depicts the delineated 100-year floodplain boundary in relationship to the Madera site.

Average flood depths for the Madera site are one foot, which are derived from the detailed hydraulic analyses shown within the flood zone map (Komex, 2005). Floodwaters on site progress from east to west as a result of excess runoff associated with Dry Creek and Schmidt Creek. The average floodplain width in proximity to the Madera site is about 11,100 feet (2± miles), and the overall terrain slope is mild from east to west. A small linear area along the eastern edge of the property boundary adjacent to Highway 99 is designated as Zone X, which is determined to be outside the 100-year and 500-year floodplains. Aside from this zone, the remaining area of the Madera site is designated as flood Zone AO, as described above.

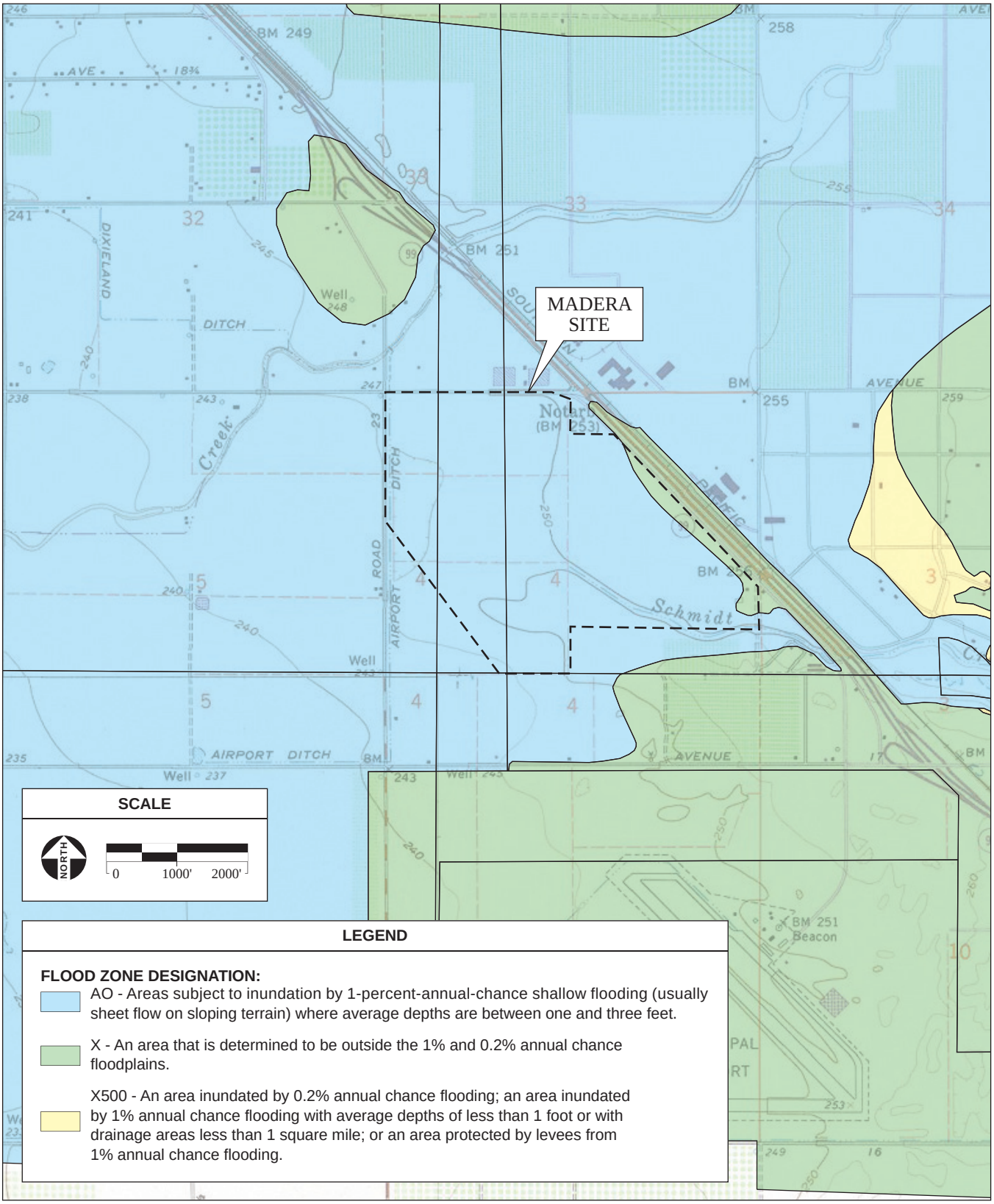
NORTH FORK SITE

Watershed

Locally, the North Fork site lies within the Upper San Joaquin Watershed Sub-basin (USGS HUC No. 18040006) (**Figure 3.3-3**), which includes the Middle, North, and South Forks of the San Joaquin River. A tributary stream to Whisky Creek flows across the eastern part of the North Fork site. Another stream, tributary to Willow Creek, originates near the southwestern corner of the property. Whisky Creek is located about 400± feet from the southeast corner of the property at the most adjacent location (**Figure 1-5**).

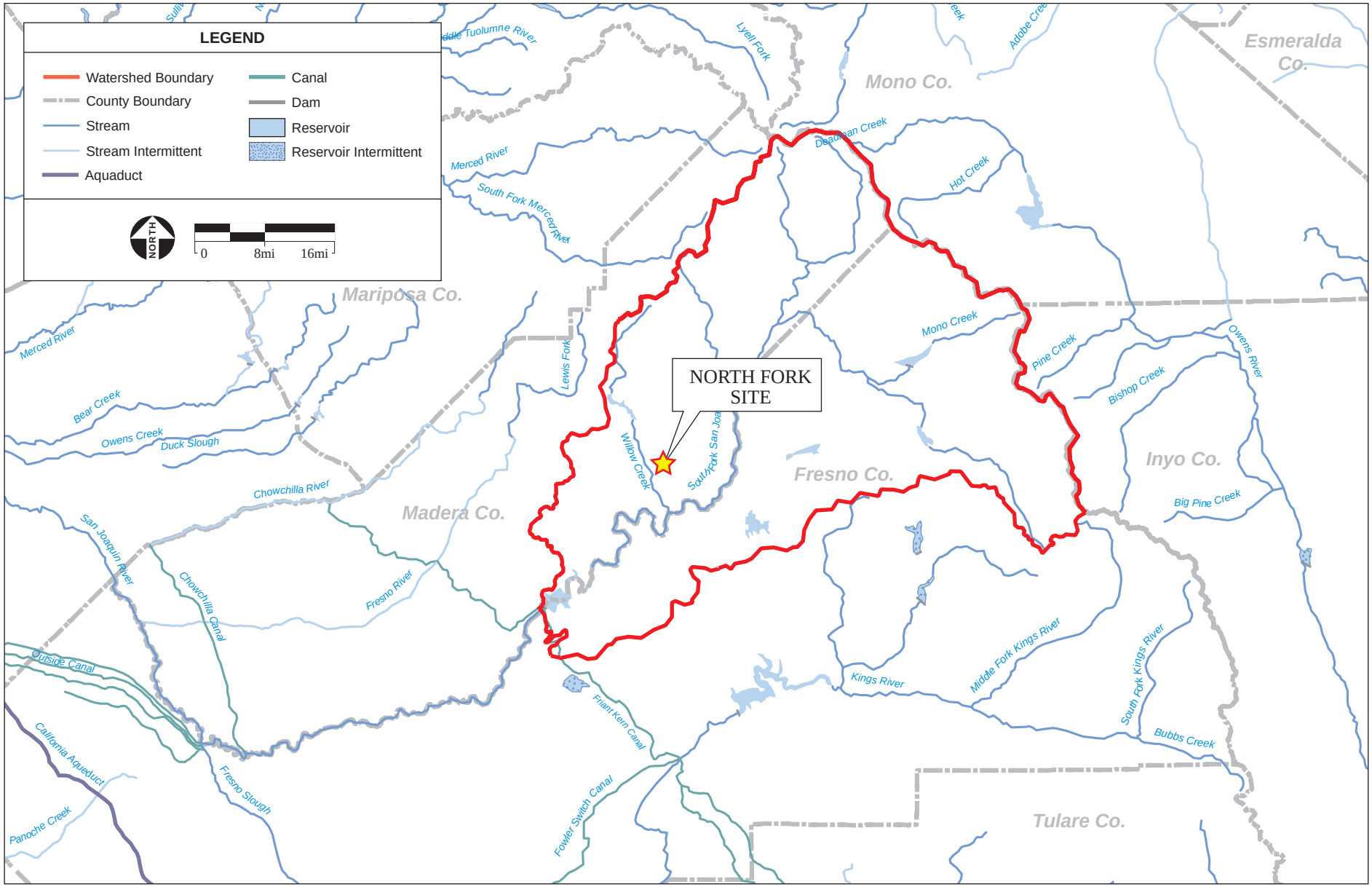
Drainage

The North Fork site occupies wooded, south-facing slopes of the Sierra foothills, ranging in elevation from approximately 2,920 feet amsl in the southwest, to approximately 3,480 portion of the property to the eastern portion of the property. The site accepts runoff from the property east of Mission Drive and runoff sheet flows to the westerly property line into Whisky Creek. Whisky Creek flows south from the North Fork site into Willow Creek, which is a tributary of the San Joaquin River.



SOURCE: "Berenda, CA" & "Kismet, CA" USGS 7.5 Minute Topographic Quadrangles, Sections 32 & 33, T10S, R17E and Section 4, T11S, R17E, Mt. Diablo Baseline and Meridian ; FEMA National Flood Insurance Program Q3 Flood Data, May 1996; AES, 2006

Figure 3.3-2
Madera Site FEMA Flood Zone Map



SOURCE: AES, 2006

Figure 3.3-3
Upper San Joaquin Watershed Map

Floodplain

Whiskey Creek is the nearest water body that may cause potential flooding problems on the North Fork site. Based on the FIRM, panel number 0601700375B prepared by FEMA, the entire site is contained within Zone D, which is the flood insurance rate zone that corresponds to "an area of undetermined but possible flood hazards." Based on the topography (**Figure 1-5**) and the relatively low flow of streams crossing the North Fork site, flooding is unlikely to occur, except in areas immediately adjacent to streambeds. In those adjacent areas, flooding is likely to be minor and temporary, possibly occurring during heavy storm events.

3.3.2 GROUNDWATER

REGIONAL SETTING

Groundwater is the water occurring beneath the earth's surface that completely fills (saturates) the void space of rocks or sediment. Given that all rock has some open space (voids), groundwater can be found underlying nearly any location. In the San Joaquin Valley of western Madera County, potable groundwater occurs mainly in the unconsolidated alluvial deposits of Pleistocene and Holocene age [California Department of Water Resources (CDWR), 2004]. In the foothills to the east, groundwater occurs predominantly in fractured bedrock, but also in gravel- and silt-filled stream courses and meadows (Komex, 2005).

The Madera Sub-basin No. 5-22.06 of the larger San Joaquin River Hydrologic Unit underlies both the Madera site and the North Fork site. According to California's Groundwater Bulletin 118, the Madera Sub-basin (the Sub-basin) contains no apparent groundwater barriers (CDWR, 2004). The Sub-basin consists of lands overlying the alluvium in Madera County. Although younger alluvium and flood-basin deposits yield small quantities of water to wells, the most important aquifer in the area is the older alluvium, which consists mostly of intercalated lenses of clay, silt, sand, and some gravel. The estimated average specific yield of the groundwater Sub-basin is 10.4 percent (CDWR, 2004).

Ground surface elevations in Madera County range from less than 300 feet amsl in the west to over 13,000 feet amsl in the east. Groundwater flow is generally southwestward in the eastern part of the Sub-basin and to the northwest in the southern portion, away from the recharge area along the San Joaquin River. On average, the sub-basin water level has declined nearly 40 feet from 1970 through 2000 (CDWR, 2004). According to calculations using an estimated specific yield of 10.4 percent and water levels collected by the CDWR, the total storage capacity of the Sub-basin is estimated to be 18,500,000 acre feet (af) to a depth of 300 feet and 40,900,000 af to the base of fresh groundwater.

MADERA SITE

The Madera site lies within the Madera Sub-basin of the San Joaquin Valley Groundwater Basin. Water-bearing units in the Madera Sub-basin comprise unconsolidated deposits of Pleistocene and Holocene age (CDWR, 2004). Borehole logs drilled near to the Madera site, obtained from CDWR, indicate alternating sandy and clayey layers to at least 700 feet below ground surface (bgs) with the sandier horizons generally accounting for between 25 percent and 40 percent of the total thickness (Komex, 2005). These drillings indicate the Madera site overlies the Older Alluvium aquifer found within Madera County (Komex, 2005). According to Komex (2005), an important regional aquitard, the E-clay or Corcoran Clay, is not thought to be present beneath the Madera site; its eastern boundary lies about 4 miles to the southwest.

On-Site Groundwater Wells

One active agricultural well exists on the property. Komex attempted to measure the depth to groundwater, but an obstruction was met before groundwater was reached on each occasion. In lieu of direct measurements, maps produced by CDWR were used to approximate groundwater elevation levels as interpreted from spring measurements in designated wells. CDWR interpretations based on records for nearby wells exhibit an overall decline in groundwater levels of approximately 80 feet between 1958 and 2003, with the current groundwater level interpolated to be about 145 feet bgs (**Appendix L**). The dominant influence on groundwater flow direction in the area over the last 15 years appears to be a pumping depression located northwest of the Madera site, beneath an area approximately half way between the Cities of Madera and Chowchilla (Komex, 2005). Comparison of local well hydrographs, precipitation records and reservoir storage data shows short-term correlations between rainfall amount/storage and groundwater levels, but also a long-term decline in groundwater levels that is independent of climatic factors (**Appendix L**).

Municipal Water Supply

Currently, no municipal water supply exists at the Madera site. The City of Madera uses groundwater as its municipal supply and is regulated by the City's Public Works Department. Municipal Well Number 26 is located about one mile south of the Madera site at the intersection of Airport Drive and Aviation Drive. This well is approximately 600 feet deep and has a capacity of approximately 1,300 gpm. Municipal Well Number 25 is also located about 1.5 miles southeast of the Madera site, and is approximately 500 feet deep with a capacity of approximately 2,200 gpm. According to the *City of Madera Comprehensive General Plan and Environmental Impact Report*, the groundwater level has been dropping in the region; however, the City has not experienced any significant problems with supply or quality (City of Madera, 1992). Accordingly, the City plans to use groundwater to serve future development. Unincorporated areas generally rely on individual wells, but some are linked to the City's water system. New development in the State Center Community College Area is proposed to hook up to the City's

water and sewer systems. The Fresno River runs through the center of Madera, but is not used for domestic water supply.

The Madera site is also located within the Madera Irrigation District (MID), which is one of four irrigation districts that manage surface water supply for agricultural irrigation in Madera County. The MID is the main water supplier in the County, covering the most acreage and managing the Madera Canal (located east of the Madera site) for the United States Army Corps of Engineers (USACE). A MID water supply ditch is located along the western border of the Madera site and the nearest public residential water supply lines are located about ½ mile south of the property along Airport Drive. The majority of the Madera site is classified by MID as capable of receiving irrigation water from the MID ditch; however, the existing owner of the property utilizes private groundwater wells for water supply and is currently not under contract to receive MID water.

NORTH FORK SITE

The North Fork site overlies granitic basement rocks, within which groundwater is present in fractures. Little information is available on groundwater occurrence, levels, flow, or storage; however, groundwater is widely used for domestic supply in the area, with wells reportedly achieving yields of between 10 and 240 gallons per minute (gpm).

On-Site Groundwater Wells

Domestic water supply is currently provided by four active wells located at private residences. The water level in one of these wells was measured at approximately 60 feet below ground surface (bgs) on April 13, 2005 (Komex, 2005, **Appendix L**). The depth of the wells was not determined, but the yield of the well was estimated to be less than 10 gallons per minute (gpm). Several springs were also reportedly located near the residences and had historically been developed for water supply; however, the capacities of these springs are not known. Anecdotal evidence from current residents and other local residents suggests that a number of springs and wells exist on land allotments adjacent to the North Fork site. One of these wells was reportedly drilled to 400 feet bgs, and yielded 55 gpm at the time of installation. Another well reportedly tested at 100 gpm, with no measurable drawdown. Other wells are reported to have been drilled to at least 700 feet bgs.

Based on a study conducted by Madera County in 2002, the median well yield of 1,492 well log records in the foothills region of eastern Madera County is 8.5 gpm and average well yield is 22 gpm (HydroScience Engineers, 2006). These well yields are based on drillers' airlift tests, so actual production may be lower. According to the property owner on the North Ranch Property, the four wells on the North Fork site are not drilled as deep as the City wells located near the Madera site; however, water production from each well is strong, with capacities ranging from 332 to 783 gpm (AES, 2004). Overall water balance and current water demands in the foothill

region suggest that a sufficient quantity of water is available on a regional basis to meet current demands and support some future development (City of Madera, 1992; Madera County, 1995b). Therefore, groundwater appears to be plentiful in the area of the North Fork site.

Municipal Water Supply

Currently there is no municipal water supply at the North Fork site. The North Fork Maintenance District 8A supplies water to the Town of North Fork, which is located approximately 5 miles west of the site. The water system has one 520-feet deep groundwater well, pumping 240 gpm into a 200,000-gallon storage tank. In 2002, water shortages had not been reported as an issue for this district (Komex, 2005). An additional existing well is currently inactive but available for future use.

Cascadel Water Company additionally supplies a community located about 4,000 feet northeast of the North Fork site. Water has been supplied from a spring and three wells. Wells 1 (525 feet deep) and 1A (650 feet deep) produce 57 gpm combined, and Well 2 (600 feet deep) produces 25 gpm (Cascadel Water Company, 2005).

3.3.3 WATER QUALITY

REGULATORY SETTING

In 1972, Congress passed the Federal Clean Water Act, which sets forth national goals for the quality of surface waters, applying to both point and non-point sources of pollution (33 USC Sections 402 and 319 respectively). These goals include maintaining waters safe for fishing and swimming, eliminating harmful discharges of pollution, and the protection of the nation's wetlands. The Clean Water Act also requires states to establish beneficial uses and set water quality standards for all contaminants in the surface waters and to review and update them on a triennial basis (Section 303(c)).

As a result of the 1987 Clean Water Act amendments, the USEPA established the National Pollutant Discharge Elimination System (NPDES), pursuant to the Clean Water Act (Sections 1251 to 1387). NPDES is a national program for regulating and administering permits for discharges to receiving waters. In some states, including California, the USEPA has delegated permitting authority to the state water quality management agencies; however, the USEPA continues to regulate discharges originating on Tribal lands into receiving waters. Under the Clean Water Act, Indian Tribes can be treated as states, implying the use of Tribal Government Regulations, for the purpose of NPDES program [33 USC § 1377(e)].

Section 303(d) of the Clean Water Act requires states to periodically prepare a list of all surface waters in the state for which beneficial uses of the water are impaired by pollutants. These are estuaries, lakes, streams, and groundwater basins that fall short of state surface water quality

standards, and are not expected to improve within the next two years. States are also required to establish a priority ranking of these impaired waters for purposes of developing plans that include Total Maximum Daily Loads (TMDLs). A TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards and an allocation of that amount to the pollutant's sources. These plans describe how an impaired water body will meet water quality standards through the use of TMDLs.

The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB) have adopted a Water Quality Control Plan for the State of California. The purpose is to provide a program of actions designed to preserve and enhance water quality and to protect the water supply for beneficial uses. The SWRCB has primary responsibility for establishing water quality standards in the County. In addition, the California Department of Fish and Game (CDFG) and the County Environmental Health Department have codes and ordinances, which also provide for water quality protection.

While the RWQCB does not have approval authority over the project alternatives, the goals and policies relating to Fresno River, Dry Creek, Schmidt Creek, and its tributaries contained within the Water Quality Control Plan for the Sacramento-San Joaquin Region (Basin Plan) are summarized to characterize the water quality issues in the project area.

Under the mandate of the Safe Drinking Water Act, the USEPA defines National Primary Drinking Water Regulations for groundwater (primary standards). These are legally enforceable standards that apply to public water systems. These standards are established to protect human health by limiting the levels of contaminants in drinking water. The USEPA also defines National Secondary Drinking Water Regulations (secondary standards). These secondary standards are non-enforceable. They regulate contaminants that cause cosmetic effects or aesthetic effects. USEPA recommends these standards to water systems but does not require systems to comply.

Both primary and secondary drinking water standards are defined as either Maximum Contaminant Levels (MCL) which are the highest level allowed in drinking water, or Maximum Contaminant Level Goals (MCLG) which are the level of contaminant below which there is no known or expected risk to health. The 1996 amendments to the Safe Drinking Water Act also require that states complete source water assessments for all public drinking water systems and include MCLs or MCLGs for all potential contaminants. Contaminants that may be present in untreated water include microbial contaminants, inorganic contaminants, pesticides and herbicides, radioactive contaminants, and organic chemical contaminants.

REGIONAL SETTING

Surface water quality in Madera County differs from east to west and from north to south, due to varying degrees of turbidity, color, odor and chemical characteristics. The differences in surface water quality are caused by the climate and the differences in the physical character of the geology in the smaller watersheds. The Sierra Nevada Mountains dispense low amounts of dissolved solids into east side streams and rivers, while the west side streams have a much higher salinity rate due to the sediments that comprise the Diablo Range of the Coastal Mountains. Similarly, the stream flow into the Merced River in the northern part of the County is of very good quality, but gradually decreases south through the Valley due to the inflow of excess irrigation waters.

The majority of the Madera Sub-basin is generally a calcium-sodium bicarbonate type, with sodium bicarbonate and sodium chloride at the western margin of the Sub-basin along the San Joaquin River (CDWR, 2004). The quality of groundwater is determined primarily by salt concentrations, and to a lesser degree by levels of nutrients, pesticides and other contaminants. Low quality groundwater is found throughout much of the San Joaquin Valley Basin with high levels of soil boron and total dissolved solids occurring west of the San Joaquin River. Additionally, concentrations of nitrates and pesticides are generally found in shallow wells northwest of Atwater. Overall groundwater quality is generally similar to surface water quality; it is good to excellent in the high foothill areas and decrease in quality toward the Valley center low areas.

Concentrations of total dissolved solids (TDS) within the Madera Sub-basin are in the 100 to 300 parts per million (ppm) range, but several wells in the Hillview Water Company systems had TDS concentrations that exceeded 10,000 ppm. Although these levels do not present a health concern, a more mineralized taste may result (HydroSceience Engineers, 2005). Some water quality problems do occur in the County systems, including elevated concentrations of total coliform bacteria, gross alpha/uranium, arsenic, iron, and manganese. Although naturally occurring and typically related to the granitic rocks of the Sierra Nevada, elevated concentrations of gross alpha uranium and arsenic have rendered some sources of supply nonpotable. Elevated concentrations of iron and manganese seem to correlate to elevated turbidity in the sample and may indicate iron and manganese that are in soil/rock particles in the sample and not actually dissolved in the water (Madera County, 1995b).

MADERA SITE

Surface Water Quality

The Madera site is located within the Middle San Joaquin-Lower Chowchilla Watershed area of the southern portion of the San Joaquin River Basin. The beneficial and potential beneficial uses

of the Fresno River, Chowchilla River, and related tributaries are identified in the Sacramento-San Joaquin Basin Plan as follows:

- Municipal and Domestic Supply
- Agricultural Supply
- Water Contact Recreation
- Non-Contact Recreation
- Warm Freshwater Habitat
- Wildlife Habitat

The water quality objectives for the Sacramento-San Joaquin River Basin inland surface waters, including the Fresno River, are summarized in **Table 3.3-1** below.

Schmidt Creek and Fresno River are not designated as part of the RWQCB's 303(d) listing of impaired water bodies; however, the Fresno River drains into the San Joaquin River, which is listed as an impaired water body. The receiving waters are designated by the RWQCB to have existing beneficial uses as previously described.

TABLE 3.3-1
WATER QUALITY OBJECTIVES FOR INLAND SURFACE WATERS OF THE SACRAMENTO-SAN JOAQUIN RIVER BASIN

Constituent	Water Quality Objective
Bacteria	In waters designated for contact recreation (REC-1) the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 ml, nor shall more than ten percent of the total number of samples taken during any 30-day period exceed 400/100 ml.
Chemical Constituents	Waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. Water designated for use as domestic or municipal (MUN) water supply shall not contain concentration of chemical constituents in excess of the maximum contaminant levels specified in the provisions of Title 22 of the California Code of Regulations. Water designated for use as MUN shall not contain lead in excess of 0.015 mg/l.
Color	Water shall be free of discoloration that causes nuisance or adversely affects beneficial uses.
Dissolved Oxygen	The dissolved oxygen concentrations shall not be reduced below the following minimum levels at any time for the following designated waters: 1. Cold Freshwater Habitat – 5.0 mg/l 2. Warm Freshwater Habitat – 7.0 mg/l 3. Spawning, Reproduction, and/or Early Development – 7.0 mg/l
Floating Material	Water shall not contain floating material in amounts that cause nuisance or adversely affect beneficial uses.
Oil and Grease	Waters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating of the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.
pH	The pH shall not be depressed below 6.5 nor raised above 8.5. changes in normal ambient pH levels shall not exceed 0.5 in waters designated cold freshwater habitat or warm fresh water habitat.
Pesticides	Water quality objectives for pesticides include the following:

Constituent	Water Quality Objective
	1. No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses. 2. Discharges shall not result in pesticide concentrations in bottom sediments or aquatic life that adversely affect beneficial uses 3. Total identifiable persistent chlorinated hydrocarbon pesticides shall not be present at concentrations detectable within the accuracy of analytical methods approved by the Environmental Protection Agency or the Executive Officer. 4. Pesticide concentrations shall not exceed those allowable by applicable anti-degradation policies. 5. Pesticide concentrations shall not exceed the lowest levels technically and economically achievable. 6. Waters designated for domestic or municipal supply shall not contain concentrations in excess of the Maximum Contaminant Levels set forth in the California Code of Regulations, Title 22, Division 4, Chapter 15. 7. Waters designated for domestic or municipal supply shall not contain concentrations of thiobencarb in excess of 1.0 µg/l.
Radioactivity	Radionuclides shall not be present in concentrations that are harmful to human, plant, animal or aquatic life that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to those life beings.
Sediment	The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
Settleable Material.	Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.
Suspended Material	Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.
Tastes and Odors	Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic municipal water supplies or to fish flesh or other edible produces of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses.
Temperature	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses. At no time shall the temperature of Cold Freshwater Habitat or Warm Freshwater Habitat be increased more than 5 degrees Fahrenheit above natural receiving water temperature.
Toxicity	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses to human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances as specified by the Regional Water Board and other appropriate agencies to evaluate compliance with this objective.
Turbidity	Increased in turbidity attributable to controllable water quality factors shall not exceed the following: 1. Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs) increases shall not exceed 1 NTU. 2. Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent. 3. Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs. 4. Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

SOURCE: California RWQCB, 1998.

Groundwater Quality

Since the protection of designated beneficial uses are also relevant to groundwater quality, water quality objectives for the Sacramento-San Joaquin River Basin ground waters are also included in the Sacramento-San Joaquin Basin Plan (RWQCB, 1998). **Table 3.3-2** summarizes groundwater quality objectives.

TABLE 3.3-2
WATER QUALITY OBJECTIVES FOR GROUND WATERS OF THE SACRAMENTO-SAN JOAQUIN RIVER BASIN

Constituent	Water Quality Objective
Bacteria	In ground waters used for domestic or municipal supply the most probably number of coliform organisms over any seven day period shall be less than 2.2/100 ml.
Chemical Constituents	Ground waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. At a minimum, ground waters designated for use as domestic or municipal supply shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCL's) specified by the applicable provisions of Title 22 of the California Code of Regulations. At minimum, water designated for use as domestic or municipal supply shall not contain lead in excess of 0.015 mg/l.
Radioactivity	At a minimum ground waters designated for use as domestic or municipal supply shall not contain concentrations of radionucliedes in excess of the maximum in excess of the maximum contaminant levels (MCL's) specified by the applicable provisions of Title 22 of the California Code of Regulations.
Tastes and Odors	Ground waters shall not contain taste – or odor- producing substances in concentrations that cause nuisance or adversely affect beneficial uses.
Toxicity	Ground waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life associated with designated beneficial uses. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances.

SOURCE: California RWQCB, 1998.

Groundwater quality is generally good, but manganese levels tend to increase with depth north of the City (HydroScience Engineers, Inc., 2006). Nitrogen problems appear to be the dominant land use related pollution problem. Sources of groundwater nitrogen pollution include fertilizers, animal manures, treated sewage from percolation ponds or land disposal, septic systems, natural geologic sources and plant residues from cropland and native vegetation.

According to the Madera County General Plan, there appears to be adequate groundwater in the county to sustain growth in the near term. According to Marvin Ward, Water Quality Specialist for the Madera Public Works Department, existing water supply capacity is approximately 25 million gallons per day (mgd), with an average demand of 6 mgd. He stated that some of the extra capacity was used to provide a buffer during droughts and maintenance. Mr. Ward also noted that two new wells were planned, with the first to be completed in May 2004.

A source water assessment conducted for the City of Madera water system during February and March 2004 was included as an Appendix in the Water and Wastewater Feasibility Report (HydroScience Engineers, 2006) (**Appendix I**).

The summary of the assessment indicated that City Water Well No. 26, the nearest potential source of offsite water supply for the Madera site, was considered most vulnerable to airport activities (maintenance/fueling areas), automobiles (gas stations), historic waste dumps/landfills, and metal plating/finishing/fabricating. The activities indicated above were not associated with any detected contaminants and no current MCL exceedances from the Water Quality Inquiry database or from the State Department of Health Services exist for City Water Well No. 26. **Table 3.3-3** shows the contaminants found in the City of Madera water system. The State allows the City to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of the data, though representative, is more than one year old, with data ranging from 1996-2005.

Wastewater Effluent Quality

The nearest public sewer main is located about ½ mile south of the Madera site along Airport Drive. This main is operated by the City of Madera, which is served by a municipal wastewater treatment plant. The City of Madera has a trickling filter wastewater treatment plant, which is located at 13048 Road 21½ (at the intersection of Road 21½ and Avenue 13), and is approximately 5 miles southwest of the Madera site. The wastewater treatment plant currently treats an average of about 5 million gallons per day (mgd) and has a capacity of 7 mgd. Expansion to a 10 mgd capacity is planned to accommodate anticipated growth. During the expansion, the trickling filter system will be replaced with an activated sludge system. The treated wastewater is conveyed to percolation beds for disposal. Wastewater effluent is treated to USEPA standards prior to discharge.

NORTH FORK SITE

Surface Water Quality

The North Fork site is located within the Upper Chowchilla-Upper Fresno Watershed area of the southern portion of the San Joaquin River Basin. The beneficial and potential beneficial uses of the Fresno River, Chowchilla River, and related tributaries are identified in the Sacramento-San Joaquin Basin Plan as follows:

- Municipal and Domestic Supply
- Agricultural Supply
- Water Contact Recreation
- Non-Contact Recreation
- Warm Freshwater Habitat
- Wildlife Habitat

TABLE 3.3-3
CITY OF MADERA SOURCE WATER ASSESSMENT

Chemical Compound	MCL	MCLG	Range of Detection	Average	Typical Source of Contaminant
Primary Standards					
Aresenic (µg/L)	50	n/a	n/d – 4	0.67	Erosion of natural deposits; runoff from orchards; glass and electronics production wastes.
Barium (µg/L)	1,000	2,000	n/d – 180	30	Discharges of oil drilling wastes and from metal refineries; erosion of natural deposits.
Nitrate (mg/L) [as NO_3]	45	45	3 – 29	8.89	Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits.
DBCP (µg/L)	0.20	n/a	n/d – 0.20	0.02	Banned nematocide that may still be present in soils due to runoff/leaching from former use on soybeans, cotton, vineyards, tomatoes, and tree fruit.
Ethylene dibromide (µg/L)	0.05	0.01	0.00 – **0.51**	0.03	
Tetrachloroethylene (µg/L)	5	n/a	n/d – 2	0.22	Discharge from factories, dry cleaners, or auto shops.
Secondary Standards					
Chloride (mg/L)	500		16 – 42	22.40	Runoff/leaching from natural deposits; seawater influence.
Iron (µg/L)	300		n/d – 220	14.67	Leaching from natural deposits; industrial waste
Odor (TON)	3		1 – 1	1	Naturally occurring organic materials
pH (Std. Units)	6.5 – 8.5		5.9 – 7.4	6.55	
Specific Conductance (umho/cm)	1,600		190 – 600	273.33	Substances that form ions when in water, seawater influence.
Total Filterable Residue (mg/L)	1,000		140 – 400	200	Runoff/leaching from natural deposits.
Sulfate (mg/L)	500		3 – 17	6.75	Runoff/leaching from natural deposits, industrial waste.
Lab Turbidity (NTU)	5		0 – 0.40	0.12	
General Minerals					
Copper (mg/L)	1.30	0.17	0 – 0.19	0.114	Internal corrosion of household plumbing systems, erosion of natural deposits, leaching from wood preservatives.
Fluoride (µg/L)	2,000	100	n/d – 100	13.35	Erosion of natural deposits, from water additive that promotes strong teeth.
Lead (mg/L)	0.02	0.002	n/d – 0.01	0.0002	Internal corrosion of household plumbing systems, discharge from industrial manufacturers, erosion of natural deposits.
Organics					

Chemical Compound	MCL	MCLG	Range of Detection	Average	Typical Source of Contaminant
Tetrachlorethylene (µg/L)	5	60	0 – 2	0.22	Discharge from factories, dry cleaners and auto shops (metal degreaser)
Radioactivity					
Gross Alpha (pCi/L)	15		-0.24 – 11.3	0.96	Erosion of natural and man-made deposit.
Uranium (pCi/L)	20		-0.05 – 8.41	0.97	Erosion of natural deposits.

NOTES: Numbers shown in bold represent an exceedance of the correlating MCL. This exceedance was not representative of contaminants found at Well No. 26.
MCL = maximum contaminant level; DBCP = dibromochloropropane; g/L = micrograms per liter or parts per billion; mg/L – milligrams per liter or parts per million; NTU = nephelometric turbidity units; MCLG = maximum contaminant level goal; n/a = not applicable; n/d = non-detect.
SOURCE: City of Madera, 2004.

The water quality objectives for the Sacramento-San Joaquin River Basin inland surface waters, including the Fresno River, are summarized in **Table 3.3-1** above.

Neither Whiskey Creek, the Fresno River, nor the Chowchilla River are designated as part of the RWQCB's 303(d) listing of impaired water bodies; however, the Fresno River drains into the San Joaquin River, which is listed as an impaired water body. The receiving waters are designated by the RWQCB to have existing beneficial uses as previously described for the Madera site.

Groundwater Quality

The Sacramento-San Joaquin Basin Plan includes water quality objectives for the Sacramento-San Joaquin River Basin ground waters for additional protection of designated beneficial uses (RWQCB, 1998). **Table 3.3-2** summarizes groundwater quality objectives above.

Although a source water assessment has not been conducted for wells on the North Fork site, a Phase I was performed by AES in 2005 (**Appendix P**). The Phase I included interviews with tribal residents and record searches for on site water quality testing. According to tribal residents, the domestic water from the well located on the North Fork site has an unpleasant taste and odor. The water was tested in 1998 and 2004 for general minerals, inorganic chemicals, and fecal coliform. The analytical results were compared to USEPA Title 22 drinking water standards that are protective of human health. The water samples from 1998 exceeded both maximum contaminant levels (MCLs) for iron and manganese. Elevated iron and manganese concentrations may be due to elevated turbidity in the sample and may not reflect actual groundwater concentrations. The resident only uses the water for bathing and no longer drinks the water from the well. Additionally, according to a member of the Tribe, a sheen on the surface of the water has been known to be present (AES, 2005).

Wastewater Effluent Quality

Currently there are no wastewater treatment facilities located on the North Fork site. Residential units currently utilize individual septic systems. The County-operated wastewater treatment plant (WWTP) for the community of North Fork is located approximately one mile northwest of the site, near the intersection of Road 225 and Road 228. The WWTP uses extended aeration treatment for the 31,000 gpd it treats. Effluent is disposed of in sprayfields. Plans are underway to expand the existing wastewater treatment plant in the town of North Fork to a capacity of 60,000 gpd. The wastewater treatment plant expansion will use leachfields, in addition to the existing spray fields, for disposal of the disinfected effluent.

3.4 AIR QUALITY

3.4.1 REGIONAL METEOROLOGY

The Madera site is located in southwest Madera County, just north of the City of Madera and adjacent to State Route 99 in the San Joaquin Valley (SJV). The North Fork site is also in Madera County, but in the mountainous areas at around 3,000 feet elevation. Madera County is part of the SJVAB. The California Air Resources Board (CARB) has divided California into regional air basins according to topographic air drainage features. The SJVAB is approximately 250 miles long and averages 35 miles in width, and is the second largest air basin in the State. Air pollution is directly related to a region's topographic features. The entire SJVAB is defined by the Sierra Nevada mountains in the east (8,000 to 14,000 feet in elevation), the Coast Ranges in the west (averaging 3,000 feet in elevation), and the Tehachapi mountains in the south (6,000 to 8,000 feet in elevation). The valley is basically flat with a slight downward gradient to the northwest. The valley opens to the sea at the Carquinez Straits where the San Joaquin-Sacramento Delta empties into San Francisco Bay. Thus, the SJV could be considered a "bowl" open only to the north.

Although marine air generally flows into the basin from the San Joaquin River Delta, the region's topographic features restrict air movement through and out of the basin. The Coast Ranges hinder wind access into the SJV from the west, the Tehachapis prevent southerly passage of airflow, and the high Sierra Nevada range is a significant barrier to the east. These topographic features result in weak airflow, which becomes blocked vertically by high barometric pressure over the SJV. As a result, the valley floor of the SJVAB is highly susceptible to pollutant accumulation over time. Most of the surrounding mountains are above the normal height of summer valley inversion layers (1,500 to 3,000 feet).

CLIMATE

Local climatological effects, including wind speed and direction, temperature, inversion layers, and precipitation and fog, can exacerbate the air quality problem in the valley portion of the SJVAB. In addition, microclimate conditions can exist that influence air quality within the mountainous areas of the SJVAB.

Wind Speed and Direction

Wind speed and direction play an important role in dispersion and transport of air pollutants. Wind at the surface and aloft can disperse pollution by mixing vertically and by transporting it to other locations.

During the summer, wind speed and direction data indicate that summer wind usually originates at the north end of the SJV and flows in a south-southeasterly direction through the SJV, through

Tehachapi pass, into the Southeast Desert Air Basin. The dominant wind flow pattern (day or night) in the valley portion of the SJVAB is from the northwest to the southeast, along the axis of the valley.

During the winter, wind speed and direction data indicate that wind occasionally originates from the south end of the SJV and flows in a north-northwesterly direction. Also during the winter months, the SJV experiences light, variable winds, less than 10 mph.

Superimposed on this seasonal regime is the diurnal wind cycle. In the SJV this cycle takes the form of a combination of sea breeze-land breeze and mountain-valley regimes. The sea breeze-land breeze regime has a sea breeze flowing into the SJV from the north during the day and a land breeze flowing out of the SJV at night. The mountain-valley regime has an upslope (mountain) flow during the day and a downslope (valley) flow at night. These phenomena add to the complexity of regional wind flow and pollutant transport within the SJVAB.

At night, the same general wind flow pattern continues, with some important exceptions. First, the air is no longer able to exit the southern end of the SJVAB because it encounters cooler drainage winds from the surrounding mountains. Consequently, it is forced back north to set up a circular flow pattern known as the Fresno eddy. The eddy circulates pollutants in a counterclockwise pattern, and returns polluted air to urban areas where more precursors are added the next day. Another important difference about the nighttime winds in the SJVAB is that they typically are caused by a jet stream of fast moving air at an altitude of about 1000 ft and a speed of up to 30 mph. Lastly, some of the pollutants transported to higher altitudes from daytime heating return to the valley at night because of drainage winds from the mountains.

Temperature

The SJVAB has an "inland Mediterranean" climate averaging over 260 sunny days per year. The valley floor (including the Madera site) is characterized by warm, dry summers and cooler winters. Summer high temperatures in the valley floor often exceed 100 ºF, averaging in the low 90s in the northern valley and high 90s in the south. In the entire valley, high daily temperature readings in summer average 95 ºF. Over the last 30 years, the valley averaged 106 days a year 90 ºF or hotter, and 40 days a year 100 ºF or hotter. The daily summer temperature variation can be as high as 30 ºF.

Climate in the North Fork site area is demonstrated by data from the Western Regional Climate Center (2005) for the North Fork Ranger Station, approximately 2 miles south southwest of the North Fork site. Maximum high temperatures at the North Fork Ranger station since 1948 have averaged 90.7 ºF during the summer months and the minimum nighttime temperatures have averaged 31.3 ºF during the winter months. This station has recorded extremes of up to 110 ºF in

October of 1951 and down to 6 ºF in January of 1950. In the summer, the site can expect over 60 days above or equal to 90 ºF and in the winter, over 50 days of sub freezing nights.

In winter, as the cyclonic storm track moves southward, the storm systems moving in from the Pacific Ocean bring a decidedly maritime influence to the SJV. The high mountains to the east prevent the cold, continental air masses of the interior from influencing the valley. Thus, winters are mild and humid. Temperatures below freezing are unusual. Average high temperatures in the winter are in the 50s, but highs in the 30s and 40s can occur on days with persistent fog and low cloudiness. The average daily low temperature is 45 ºF.

Temperature Inversions

The vertical dispersion of air pollutants in the SJV is limited by the presence of persistent temperature inversions. Because of expansional cooling of the atmosphere, air temperature usually decreases with altitude. A reversal of this atmospheric state, where the air temperature increases with height, is termed an inversion. Inversions can exist at the surface, or at any height above the ground. The height of the base of the inversion is known as the "mixing height". This is the level to which pollutants can mix vertically. Semi-permanent systems of high barometric pressure fronts frequently establish themselves over the SJVAB, deflecting low-pressure systems that might otherwise bring cleansing rain and winds.

Air above and below the inversion base does not mix because of differences in air density. Warm air above the inversion is less dense air than below the base. The inversion base represents an abrupt density change where little exchange of air occurs. This phenomenon is similar to that of the abrupt density change that separates skim and whole milk. Pollutant concentration levels are often directly related to inversion layers due to the limitation of mixing space.

Precipitation and Fog

Precipitation and fog tend to reduce or limit some pollutant concentrations, especially those reliant on sunlight. Precipitation in the SJV is strongly influenced by the position of the semi-permanent subtropical high-pressure belt located off the Pacific coast (Pacific High). In the winter, this high-pressure system moves southward, allowing Pacific storms to move through the SJV. These storms bring in moist, maritime air that produces considerable precipitation on the western, upslope side of the Coast Ranges. Significant precipitation also occurs on the western side of the Sierra Nevada. On the valley floor, however, there is some downslope flow from the Coast Ranges. The resultant evaporation of moisture from associated warming results in minimal precipitation. Nevertheless, the majority of the precipitation in the SJV is produced by those storms during the winter. Precipitation during the summer months is in the form of convective rain showers and is rare. It is usually associated with an influx of moisture into the SJV through the San Francisco area during an anomalous flow pattern in the lower layers of the atmosphere.

Although the hourly rates of precipitation from these storms may be high, their rarity keeps monthly totals low.

Precipitation on the SJV floor and in the Sierra Nevada decreases from north to south. Stockton in the north receives about 20 inches of precipitation per year; Fresno in the center receives about 10 inches per year; and Bakersfield at the southern end of the valley receives less than 6 inches per year. This is primarily because the Pacific storm track often passes through the northern part of the State while the southern part of the State remains protected by the Pacific High. Precipitation in the SJVAB is confined primarily to the winter months with some also occurring in late summer and fall. Average annual rainfall for the entire SJV is 9.25 inches on the SJV floor. The North Fork Ranger Station has had an average of 31.59 inches of rain per year since 1948 with 67 percent occurring in the months of December through March.

Snowstorms, hailstorms, and ice storms occur infrequently in the SJV and severe occurrences of any of these are very rare. The winds and unstable air conditions experienced during the passage of storms result in periods of low pollutant concentrations and excellent visibility. Between winter storms, high pressure and light winds allow cold moist air to pool on the SJV floor. This creates strong low-level temperature inversions and very stable air conditions. This situation leads to the SJV's famous Tule Fogs[1]. The formation of natural fog is caused by local cooling of the atmosphere until it is saturated (dew point temperature). This type of fog, known as radiation fog, is more likely to occur inland. Cooling may also be accomplished by heat radiation losses or by horizontal movement of a mass of air over a colder surface. This second type of fog, known as advection fog, generally occurs along the coast.

3.4.2 REGULATORY CONTEXT

FEDERAL CLEAN AIR ACT (CAA)

The CAA was first signed into law in 1963 with the purpose of controlling air pollution and providing a framework for national, state, and local air pollution control efforts. Congress amended the CAA in 1970, 1977, and 1990 (42 USC 7401 *et seq.*). Basic components of the CAA and its amendments include national ambient air quality standards (NAAQS) for major air pollutants, hazardous air pollutants standards, state implementation plan (SIP) requirements, motor vehicle emissions standards, and enforcement provisions.

National Ambient Air Quality Standards (NAAQS)

The NAAQS are ambient air quality standards that define clean air and are established to protect even the most sensitive individuals. An air quality standard defines the maximum amount of a

[1] Tule fog is a dense night and morning valley fog that is commonly known as "tule fog" because of its prevalence in marshy areas populated by tule reeds or cattails. Technically, it's a radiation fog, which forms as the ground cools off at night and radiates heat into space. (Null, 2001)

pollutant that can be present in outdoor air without harm to the public's health. NAAQS have been established for ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM), and lead.

State Implementation Plan (SIP)

The CAA requires states containing areas with air quality violating the NAAQS to prepare an air quality control plan, referred to as the State Implementation Plan (SIP). The SIP contains the strategies and control measures that states such as California will use to attain the NAAQS. The SIP is not a single document, but a compilation of new and previously submitted plans, programs, rules, regulations, and controls. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, rules, and regulations of air basins as reported by the agencies with jurisdiction over them. Many of California's SIP documents rely on the same control strategies, including emission standards for cars and heavy trucks, fuel regulations, and limits on emissions from consumer products.

CALIFORNIA CLEAN AIR ACT (CCAA)

The CCAA was first signed into law by the State in 1988 (and amended in 1992), with the purpose of providing additional air quality planning requirements and other standards independent of the CAA. The CCAA delineates California's air quality goals, planning mechanisms, regulatory strategies, and standards of progress. The CCAA requires air districts like the SJVAPCD to develop and implement plans to attain California ambient air quality standards (CAAQS) established by CARB. In general, the district plans must be designed to achieve and maintain State ambient air quality standards through emission reductions from stationary and transportation sources by the "earliest practicable date," and must reduce excessive emissions of pollutants by five percent or more per year.

IMPLEMENTING AGENCIES

U.S. Environmental Protection Agency (EPA)

The EPA has been charged with implementing the CAA at the national level. Unlike many Federal laws, the CAA calls for primary state and local oversight at the state and local level. If states are unsuccessful in regulating air quality, there are provisions in the CAA that allow the EPA to assume authority from the state. For instance, the EPA reviews SIPs to determine if they conform to the mandates of the CAA and will achieve air quality goals when implemented. If the EPA determines a SIP to be inadequate, it may prepare a Federal Implementation Plan (FIP) for the non-attainment area and impose additional control measures.

Thus, the EPA deals primarily with global, international, national, and interstate air pollution issues. Its primary role at the state level is one of oversight of state air quality agencies and

programs. The EPA sets Federal standards for vehicle and stationary sources and provides research and guidance in air pollution programs.

California Air Resources Board (CARB)

CARB is the agency responsible for coordination and oversight of State and local air pollution control programs in California; for implementing the CCAA; and for implementing much of the CAA within California. CARB's primary responsibilities include establishing CAAQS, approving local air plans, submitting the SIP to the EPA, regulating mobile emission sources, and overseeing and providing technical support to California's 35 air districts, which are organized at the county or regional level. State law makes CARB the lead agency for all purposes related to the SIP. Local air districts and other agencies, such as the Bureau of Automotive Repair, prepare SIP elements and submit them to CARB for review and approval.

San Joaquin Valley Air Pollution Control District (SJVAPCD)

Air districts have the primary responsibility for control of air pollution from all sources other than motor vehicle emissions, which are the responsibility of CARB and EPA. Air districts adopt and enforce rules and regulations to achieve State and Federal ambient air quality standards and enforce applicable State and Federal law. Both the Madera and North Fork sites are located within the SJVAPCD. The SJVAPCD has jurisdiction over air quality matters in the San Joaquin Valley Air Basin (SJVAB). Its headquarters are located in Fresno with regional offices located in Bakersfield in the Southern Region and Modesto in the Northern Region. Its jurisdiction includes the entire Counties of Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare and the central and western portion of Kern County.

Until the passage of the CCAA and 1990 CAA amendments, the primary role of air districts was controlling stationary sources of pollution, such as industrial processes and equipment. Air districts are now required to implement transportation control measures and are encouraged to adopt indirect source control programs to reduce mobile source emissions. These mandates created the necessity for air districts to work closely with cities, counties, and regional transportation planning agencies to develop new programs.

The SJVAPCD entered into a memorandum of understanding with the transportation planning agencies of the eight counties in the SJVAB in 1992. This memorandum of understanding ensures a coordinated approach in the development and implementation of transportation plans throughout the valley. This action has helped the regional transportation planning agencies comply with pertinent provisions of the CAA and CCAA, as well as related transportation legislation (such as the Intermodal Surface Transportation Efficiency Act).

AIR QUALITY STANDARDS, RULES, AND REGULATIONS

Federal and State Ambient Air Quality Standards

NAAQS and CAAQS have been established for certain "criteria pollutants" to protect public health and welfare. NAAQS have been established for ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM), and lead. For some of the pollutants, the EPA and States have identified air quality standards expressed in more than one averaging time in order to address the typical exposures found in the environment. For example, CO is expressed as a one-hour averaging time and an eight-hour averaging time. Regulation of air pollution is achieved holding an area accountable to both national and state ambient air quality standards, as shown in **Table 3.4-1,** and setting emission limits for individual sources of air pollutants.

The EPA has classified air basins or portions thereof as "unclassifiable[2]/attainment[3]" or "non-attainment[4]", based on whether or not the NAAQS have been achieved or whether a determination is possible with available data. The EPA has also classified the non-attainment areas according to the severity of pollution in each with each level requiring a different projected attainment date. There are five classes of non-attainment areas, ranging from marginal (relatively easy to clean up quickly) to extreme (will take a lot of work and a long time to clean up). The CAA uses the classification system to design cleanup requirements appropriate for the severity of the pollution and set realistic deadlines for reaching cleanup goals. Unclassified areas are those for which air monitoring has not been conducted but which are assumed to be in attainment.

As shown in **Table 3.4-2**, Madera County is part of the SJVAB, which was designated non-attainment under the Federal 8-hour ozone standard under subpart 2[5] and classified as "serious" with an attainment deadline of June 2013. The entire County of Madera is also classified serious non-attainment for PM_{10} and non-attainment for $PM_{2.5}$. Madera County meets the Federal standards or is unclassifiable for all other pollutants.

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2 Unclassifiable – any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

3 Attainment – any area that meets the national primary or secondary ambient air quality standard for the pollutant.

4 Non-attainment – any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for a pollutant.

5 Under subpart 2, areas are classified based on each area's ozone design value. Control requirements depend on an area's subpart 2 classification. Areas with more serious ozone pollution are subject to more prescribed requirements and are given longer to attain the standard. The requirements are designed to bring areas into attainment by their specified attainment dates.

TABLE 3.4-1
AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	Standard		Violation Criteria	
		CAAQS	NAAQS	CAAQS	NAAQS
Ozone	1 hour	0.09 ppm	0.12ppm[a]	If exceeded	Revoked June 15, 2005
	8 hour	0.070 ppm	0.08 ppm	N/A	Average of the annual fourth highest daily maximum is greater than standard
Carbon monoxide	1 hour	20 ppm	35 ppm	If exceeded	If exceeded on more than 1 day per year
	8 hour	9 ppm	9 ppm	If exceeded	If exceeded on more than 1 day per year
Nitrogen dioxide	Annual average	N/A	0.053 ppm	N/A	If exceeded
	1 hour	0.25 ppm	N/A	If exceeded	N/A
Sulfur dioxide	Annual arithmetic mean	N/A	0.03 ppm	N/A	If exceeded
	24 hours	0.04 ppm	0.14 ppm	If exceeded	If exceeded on more than 1 day per year
	1 hour	0.25 ppm	N/A	If exceeded	N/A
Hydrogen sulfide	1 hour	0.03 ppm	N/A	If equaled or exceeded	N/A
Vinyl chloride	24 hours	0.01 ppm	N/A	If equaled or exceeded	N/A
Respirable particulate matter	Annual arithmetic mean	20 µg/m^3	50 µg/m^3	If exceeded	If exceeded
	24 hours	50 µg/m^3	150 µg/m^3	If exceeded	If expected number of days is < 1
Fine particulate matter	Annual arithmetic mean	12 µg/m^3	15 µg/m^3	If exceeded	If exceeded
	24 hours	N/A	65 µg/m^3	N/A	If 98% of daily averages, averaged over 3 years, greater than standard
Sulfate particles	24 hours	25 µg/m^3	N/A	If equaled or exceeded	N/A
Lead particles	Calendar quarter	N/A	1.5 µg/m^3	N/A	If exceeded no more than 1 day per year
	30-day average	1.5 µg/m^3	N/A	If equaled or exceeded	N/A

NOTES: National standards shown are the primary (health effects) standards.
N/A = not applicable.
[a] This Standard was revoked June 15, 2005.
ppm = parts per million.
µg/m^3 = micrograms per cubic meter.
SOURCE: CARB, 2005; AES, 2005.

TABLE 3.4-2
MADERA COUNTY NAAQS ATTAINMENT STATUS

Pollutant	Federal Attainment Status Designation – Classification
Ozone (8-hour)	Non-attainment[10] -- Serious
Respirable Particulate Matter (PM_{10})	Non-attainment -- Serious
Fine Particulate Matter ($PM_{2.5}$)	Non-attainment[11]
Carbon Monoxide	Unclassifiable/Attainment
Nitrogen Dioxide	Unclassifiable/Attainment
Sulfur Dioxide	Unclassifiable
Lead	Unclassifiable/Attainment

SOURCE: CARB 2005; AES, 2005.

CARB has classified air basins, or portions thereof, as unclassified[12], transitional, attainment[13], or non-attainment[14], based on whether or not the CAAQS have been achieved or whether a determination is possible with available data. A non-attainment designation indicates a violation of the State standard. A non-attainment-transitional designation indicates improving air quality, with occasional violations or exceedances of the State standard. In contrast, an attainment designation indicates no violation of the State standard. Finally, an unclassified designation indicates either no or incomplete air quality data. CAAQS have been established for ozone (O_3), carbon monoxide (CO), particulate matter (PM), nitrogen dioxide, sulfur dioxide, sulfates, lead, hydrogen sulfide, and visibility-reducing particles.

In June 2002, CARB adopted a new State standard for fine particulate matter or $PM_{2.5}$. The State $PM_{2.5}$ standard is 12 micrograms per cubic meter ($\mu g/m^3$), measured as an annual arithmetic

[10] Ozone 8-hour non-attainment areas are those that have violated, or have contributed to violations of, the national 8-hour ozone standard over a three-year period.

[11] $PM_{2.5}$ non-attainment areas are those areas with air quality levels exceeding the standards, plus nearby areas contributing to such violations.

[12] Unclassified – a pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or non-attainment.

[13] Attainment – a pollutant is designated attainment if the state standard for that pollutant was not violated at any site in the area during a three-year period.

[14] Non-attainment – a pollutant is designated non-attainment if there was at least one violation of a State standard for that pollutant in the area.

mean. When CARB adopted the State $PM_{2.5}$ standard, it also made modifications to the existing State PM_{10} and sulfates standards. CARB lowered the existing State annual PM_{10} standard from 30 µg/m^3 to 20 µg/m^3 and revised the averaging method (from an annual geometric mean to an annual arithmetic mean). In addition, CARB changed the measurement method for the State sulfates standard, but left the level of the standard unchanged at 25 µg/m^3 for a 24-hour averaging time. The old method for sulfates was based on total suspended particulate matter or TSP measurements, while the new method is based on PM_{10} measurements. All of these changes became effective on July 5, 2003. In addition, on April 28, 2005, CARB approved an 8-hour ozone standard of 0.070 ppm that became effective in May 17, 2006.

According to CARB and as presented in **Table 3.4-3**, the entire County of Madera has been designated non-attainment and classified severe under the 1-hour ozone designation, and is non-attainment for the State PM_{10} 24-hour and annual average standards and the $PM_{2.5}$ annual average standard. Madera County is either in attainment or unclassified for all other State standards.

TABLE 3.4-3
MADERA COUNTY CAAQS ATTAINMENT STATUS

Pollutant	State Attainment Status Designation – Classification
Ozone – 1-hour	Non-attainment – Severe
Respirable Particulate Matter (PM_{10}) – 24-hour and annual average	Non-attainment
Fine Particulate Matter ($PM_{2.5}$) – annual average	Non-attainment
Carbon Monoxide – 8-hour and 1-hour	Unclassified
Nitrogen Dioxide – annual average and 1-hour	Attainment
Sulfur Dioxide – 24-hour and 1-hour	Attainment
Lead – 30-day average	Attainment
Particulate Sulfate – 24-hour	Attainment
Hydrogen Sulfide – 1-hour	Unclassified
Visibility Reducing Particles – 8-hour	Unclassified

SOURCE: CARB, 2005; AES, 2005.

A district with an area designated as non-attainment for any of the remaining pollutants is not subject to any specific statutory planning requirements. However, such districts must adopt and enforce rules and regulations to expeditiously attain the State standards for these pollutants (H&SC §§ 40001 and 40913). Furthermore, a non-attainment district has the option of developing and implementing an attainment plan or adopting regulations to control the emissions that contribute to these pollutants (H&SC § 40926).

State law does not impose any specific planning requirements upon districts with areas designated as attainment or unclassified. However, State law does require that the State standards not only be attained but also maintained. State law requires the districts and the Board to make a coordinated effort to protect and enhance the ambient air quality (H&SC §§39001 through 39003). As part of this effort, the districts must adopt rules and regulations sufficiently effective to achieve and maintain the State standards (H&SC §§40001 and 41500).

Health and Safety Code Section 39614

In 2003, the Legislature enacted Senate Bill 656, codified as Health and Safety Code (H&SC) Section 39614, to reduce public exposure to PM_{10} and $PM_{2.5}$. Under H&SC Section 39614, CARB was required to develop, by January 1, 2005, a list of the most readily available, feasible, and cost-effective PM control measures available as of January 1, 2004 based on consultation with local air districts throughout the state of California. The resultant list is a collection of 103 rules that have been adopted by various air districts to reduce directly emitted PM or PM precursors (including oxides of nitrogen (NO_x), oxides of sulfur (SO_x), volatile organic compounds (VOCs)), carbon monoxide (CO), air toxic emissions, and ammonia. By July 31, 2005, Section 39614 required CARB and air districts to adopt implementation schedules for appropriate CARB and air district measures. Finally, no later than January 1, 2009, CARB must prepare a report describing actions taken to fulfill the requirements of the legislation as well as recommendations for further actions to assist in achieving the State PM standards. The bill requirements would sunset on January 1, 2011, unless extended.

SJVAPCD analyzed CARB measures and concluded that all but one of the measures that apply to District sources have been implemented or are in one of the District's attainment plans for adoption within the next two years. The exception was District Rule 4621 (Gasoline Transfer into Stationary Storage Containers, Delivery Vessels, and Bulk Plants), which was to be amended in the third quarter of 2007. This rule is a control measure in the District's Extreme Ozone Attainment Demonstration Plan, but not within the two-year schedule window required by the State law. As a control measure in a Federal attainment plan, the rule did not represent a new commitment on the part of the District in order to meet the provisions of H&SC Section 39614. The District was already planning to adopt this control measure as part of the District's ozone control strategy.

Air Toxics Rules

Provisions in Title I of the CAA that address the control of hazardous air pollutant (HAP) emissions, or air toxics, are found in Section 112 of the CAA. Section 112 of the CAA includes provisions for the promulgation of National Emissions Standards for Hazardous Air Pollutants (NESHAP), or maximum achievable control technology (MACT) standards, as well as several related programs to enhance and support the program. The EPA has identified 188 hazardous air pollutants. These pollutants are addressed by the NESHAP. The NESHAP are additional Federal

emission limitations established for less widely emitted, but highly dangerous or toxic air pollutants that are not covered by the NAAQS. The 1990 Clean Air Act Amendments direct the EPA to set standards for all major sources of air toxics (and some area sources that are of particular concern). The activities and responsibilities required under Section 112 directly affect not only the EPA, but State and local regulatory agencies as well. The complexity and number of these requirements necessitate a high degree of coordination and cooperation between the regulators to ensure that these programs are carried out effectively.

The SJVAPCD has regulations that require compliance with the asbestos demolition and renovation requirements developed by the EPA in the NESHAP regulation, 40 CFR, Part 61, Subpart M. Regulated facilities subject to the NESHAP include all commercial buildings, residential buildings with more than four dwelling units, other structures, and non-portable equipment. A single-family dwelling or residential building with four or fewer dwelling units may be exempt, depending on its past use and future use of the property. The EPA has extensive policy on NESHAP applicability to these structures.

The California Air Toxics Program establishes the process for the identification and control of toxic air contaminants and includes provisions to make the public aware of significant toxic exposures and for reducing risk. CARB's statewide comprehensive air toxics program was established in the early 1980's. California regulates air toxics through AB 1807, the Toxic Air Contaminant Identification and Control Act of 1983 and AB 2588, the Air Toxics "Hot Spots" Information and Assessment Act of 1987. Under AB 1807, CARB and the Office of Environmental Health Hazard Assessment (OEHHA) are required to list TACs based on a risk assessment process that evaluates the potential for human exposure and the health effects of a substance. AB 2588 supplements the AB 1807 program by requiring a Statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks. Individual emitters of toxic air contaminants (TAC) are required by AB 2588 to prepare Toxic Emission Inventory Plans and Reports, allowing the local air quality management district to identify and inventory toxic emissions. In 1993, the California Legislature passed AB 2728, requiring that the listed Federal hazardous air pollutants be identified as State TACs.

SJVAPCD Rules and Plans

SJVAPCD exercises permit authority through its rules and regulations. California Health and Safety Code Section 40702 specifies the SJVAPCD's rule-making authority. In addition, the District's rules and regulations are based on other Federal and State air quality requirements. Air quality rules and regulations are developed by District staff and adopted by the District's Board of Directors with specific requirements for public notification and public comment periods during the rule development process. Details of SJVAPCD rules and plans can be seen at http://www.arb.ca.gov/drdb/sju/cur.htm.

These plans include a 2003 PM_{10} Plan, which met an annual 5 percent reduction requirement and provides for the implementation of best available control measures (BACM). The SJVAPCD is in the process of implementing the BACM contained in that plan and is also working on a 2006 PM_{10} Plan as specified in EPA's approval notice. On May 19, 2005, the Board adopted the 2005 Amendments to the 2003 PM_{10} Plan, primarily to revise the contingency measure discussion and to update schedules for rule adoption.

Air districts continuously monitor their progress in implementing attainment plans and must periodically report on progress to CARB and the EPA. They also periodically revise attainment plans to reflect new conditions and requirements in compliance with schedules mandated by the CCAA and the Federal CAA amendments. The California Health and Safety Code (CH&SC) requires non-attainment districts to prepare reports every three years summarizing progress in meeting the schedules for developing, adopting, and implementing the air pollution control measures contained in each district's plan for attaining the California standards. The CH&SC also requires districts to review and revise their State air quality attainment plans once every three years, beginning in 1994, to correct for deficiencies in meeting the interim measures of progress and to incorporate new data into the plan. To meet federal CAA requirements, the SJVAPCD submitted all required "Rate of Progress" and "Reasonable Further Progress" plans to show that programs adopted by the District would reduce air pollutant emissions.

The 1994 Ozone Attainment Demonstration Plan outlined the SJVAPCD's control strategy for meeting the Federal one-hour NAAQS by November 15, 1999. However, the SJVAB did not attain the Federal 1-hour ozone standard by November 15, 1999, which led to a series of EPA actions requesting additional rulemaking and plan development activities. In response to SJVAPCD and CARB requests, the EPA eventually classified the SJVAB as extreme non-attainment for the Federal 1-hour ozone standard (effective May 17, 2004), which requires attainment of the standard by November 15, 2010.

In December 2002, the SJVAPCD's Governing Board adopted the Amended 2002/2005 Rate of Progress (ROP) Plan for San Joaquin Valley Ozone. This plan demonstrated that the SJVAPCD's VOC and NO_x emissions reductions met Federal requirements for 2002 and 2005. This plan satisfied all of the EPA's requirements except demonstration of attainment of the Federal 1-hour ozone standard. In July 2003, EPA found the motor vehicle emissions budget in this plan to be adequate for transportation conformity purposes. In September 2003, EPA found the 2002/2005 ROP Plan to be complete.

In 2003 and 2004, the SJVAPCD prepared the Extreme Ozone Attainment Demonstration Plan (OADP). The Extreme OADP demonstrates attainment of the Federal 1-hour ozone standard by November 15, 2010, demonstrates that VOC and NO_x emission reductions in the SJVAB meet Federal rate of progress requirements for 2008 and 2010, and fulfills State of California

requirements for a triennial progress report on and revision of the District's 1991 Air Quality Attainment Plan, which is directed at attainment of the California ozone air quality standard.

The CARB submitted the 2004 Extreme OADP to EPA on schedule on November 15, 2004. The Plan has been deemed complete and is currently in review at EPA. The Extreme OADP sets forth the emission reductions and timeline for attaining the Federal 1-hour ozone ambient air quality standards in the SJVAB by November 15, 2010. The SJVAPCD, in conjunction with CARB, the EPA, and the eight regional Transportation Planning Agencies (TPAs) in the valley, developed the plan to provide healthy air for all of the valley's people and to meet Federal and State requirements for ozone planning documents.

On April 30, 2004 EPA issued a final rule revoking the Federal 1-hour ozone standard, effective June 15, 2005 (69 FR 23858). Therefore, effective June 15, 2005, the SJVAB was no longer non-attainment for the Federal 1-hour standard, and the November 15, 2010 date for attainment was eliminated. While the Federal 1-hour ozone standard was officially revoked on June 15, 2005, the new 8-hour rule also addresses anti-backsliding provisions in the Clean Air Act; so 8-hour ozone non-attainment areas remain subject to control measure commitments that applied under the 1-hour ozone standard. SJVAPCD focus has now shifted to the attainment of the 8-hour standard, and SJVAPCD and State emission control measures committed to in the Extreme OADP will be implemented for their contribution toward reducing 8-hour ozone levels.

Climate Change

Federal

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 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, GHGs were offered as one example of a cumulative effect.

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. We have attempted to briefly summarize these laws and policies below.

Assembly Bill 1493 (AB 1493)

Signed by the Governor in 2002, AB 1493 requires that the California Air Resources Board (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, however recently the USEPA has denied a Clean Air Act waiver, which the state needs in order to implement AB 1493. Although the state is apparently planning to appeal this decision, at this time it is unclear whether AB 1493 will be implemented (Bee, 2007).

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" or "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 (**Appendix W**).

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; **Appendix W**). 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; **Appendix W**). 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.

According to AB 32 this scoping plan must be in place no later than January 1, 2009. CARB has initiated preparation of the scoping plan and plans on adopting a final plan in late 2008 (CARB, 2007b).

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.

Western Regional Climate Initiative

The Western Regional Climate Initiative creates a coalition of western states (California, Washington, Oregon, Arizona, New Mexico) and British Columbia, Canada that have agreed to collaborate on identifying, evaluating, and implementing regional mechanisms for reducing GHG emissions. In light of this goal, the Initiative creates a regional emissions registry and plans the creation of a regional market-based multi-sector emissions reduction mechanism by August 2008.

Senate Bill 97 (SB 97)

Signed by the governor on August 24, 2007, SB 97 requires that no later than July 1, 2009, the state 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 Resources Agency is required to certify and adopt these guidelines by January 1, 2010. It is anticipated that this guidance would establish standardized significance criteria for the purposes of assessing project impacts pursuant to CEQA. In the absence of current guidelines, OPR has referred CEQA document authors to existing guidelines, examples of impact analysis in existing CEQA documents (which OPR acknowledges ranges greatly from little analysis due to the speculative nature of climate change impact analysis to the calculation of GHG emissions and the inclusion of mitigation), and to a variety of white papers on the subject of GHG impact analysis, including one prepared by the Association of Environmental Professionals (OPR, 2007).

3.4.3 POLLUTANTS OF CONCERN

Air pollution comes from many different sources. Sources are subdivided into four major emission categories: stationary sources, area-wide sources, mobile sources, and natural sources. Stationary source emissions are based on estimates made by facility operators and local air districts. Emissions from specific facilities can be identified by name and location. CARB and local air districts estimate area-wide emissions. Emissions from area-wide sources may be either from small individual sources, such as residential fireplaces, or from widely distributed sources that cannot be tied to a single location, such as consumer products and dust from unpaved roads. CARB staff estimates mobile source emissions with assistance from districts and other government agencies. Mobile sources include on-road cars, trucks, and buses and other sources

such as boats, off-road recreational vehicles, aircraft, and trains. CARB staff and the air districts also estimate natural sources. These sources include biogenic hydrocarbons, geogenic hydrocarbons, natural wind-blown dust, and wildfires. These pollution sources can emit a wide variety of pollutants, which can affect air quality in many ways. Following are the pollutants of particular concern in the SJVAB.

CARBON MONOXIDE

Carbon monoxide (CO) is a colorless, odorless gas that is formed when carbon in fuel is not burned completely. It is a component of motor vehicle exhaust, which contributes about 56 percent of all CO emissions nationwide. Other non-road engines and vehicles (such as construction equipment and boats) contribute about 22 percent of all CO emissions nationwide. Higher levels of CO generally occur in areas with heavy traffic congestion. In cities, 85 to 95 percent of all CO emissions may come from motor vehicle exhaust. Other sources of CO emissions include industrial processes (such as metals processing and chemical manufacturing), residential wood burning, and natural sources such as forest fires. Woodstoves, gas stoves, cigarette smoke, and unvented gas and kerosene space heaters are sources of CO indoors. The highest levels of CO in the outside air typically occur during the colder months of the year when inversion conditions are more frequent. Under inversion conditions warm air is unable to rise and the air pollution becomes trapped near the ground beneath a layer of warm air.

CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. The health threat from lower levels of CO is most serious for those who suffer from heart disease, like angina, clogged arteries, or congestive heart failure. For a person with heart disease, a single exposure to CO at low levels may cause chest pain and reduce that person's ability to exercise; repeated exposures may contribute to other cardiovascular effects. High levels of CO can affect even healthy people. People who breathe high levels of CO can develop vision problems, reduced ability to work or learn, reduced manual dexterity, and difficulty performing complex tasks. At extremely high levels, CO is poisonous and can cause death.

Motor vehicles are the dominant source of CO emissions in most areas. CO is described as having only a local influence because it dissipates quickly. High CO levels develop primarily during winter when periods of light winds combine with the formation of ground level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Because CO is a product of incomplete combustion, motor vehicles exhibit increased CO emission rates at low air temperatures. High CO concentrations occur in areas of limited geographic size, sometimes referred to as hot spots. Since CO concentrations are strongly associated with motor vehicle emissions, high CO concentrations generally occur in the immediate vicinity of roadways with high traffic volumes and traffic congestion, in active parking lots, and in automobile tunnels. Areas adjacent to

heavily traveled and congested intersections are particularly susceptible to high CO concentrations.

State and Federal CO standards have been set for both 1-hour and 8-hour averaging times. The State 1-hour standard is 20 parts per million (ppm) by volume, while the Federal 1-hour standard is 35 ppm. The 8-hour standard for both is 9 ppm. Madera County is designated unclassified for the State ambient CO standards and unclassifiable/attainment for the Federal CO standards.

OZONE

Ozone is a highly reactive gas molecule composed of three oxygen atoms (O_3); it has a light blue color at very high concentrations. Ozone occurs naturally at altitudes high in the stratosphere (35,000 to 65,000 feet, depending on latitude and season) where it shields life on earth from harmful ultraviolet radiation. Depletion of stratospheric ozone by chemical reactions involving anthropogenic chemicals (principally chlorofluorocarbons) allows this radiation to reach the earth's surface, thereby endangering the biosphere. Ozone is also present in the first few hundred feet of elevation above ground level (in the troposphere) due to chemical reactions between hydrocarbons and nitrogen oxides from natural and anthropogenic sources in the presence of sunlight. Because of its reactivity, tropospheric ozone present in high enough concentrations as an air pollutant adversely affects human health and damages crops and materials. All references to "ozone" in this document refer to tropospheric ozone.

Ozone is not emitted directly into the air, but is formed by a photochemical reaction in the atmosphere. Ozone is the product of a series of chemical reactions involving sunlight, reactive organic gases (ROG)[15], and nitrogen oxides (NO_x). ROG and NO_x are "ozone precursors" and are considered primary pollutants because they are emitted directly into the atmosphere. ROG is composed of hydrocarbon compounds that contribute to the formation of smog by its involvement in atmospheric chemical reactions. Ozone is considered a secondary pollutant because it is formed in the atmosphere from primary pollutants via photochemical reactions. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem and often the effects of the emitted ROG and NO_x are felt a distance downwind of the emission sources.

Generally, the higher the temperature, the more ozone is formed within the valley, since reaction rates increase with temperature. However, extremely hot temperatures can "lift" or "break" the inversion layer. Typically, if the inversion layer doesn't lift to allow the build-up of contaminants to be dispersed into the Southeast Desert, the ozone levels will peak in the late afternoon,

[15] Reactive organic gases are also sometimes called volatile organic compounds (VOCs). CARB originally expressed hydrocarbon emissions data as reactive organic gases rather than volatile organic compounds. However; CARB now considers the terms to be synonymous. VOC emissions are a subset of ROG emissions.

sometimes as late as 3 to 7 p.m. If the inversion layer breaks and the resultant afternoon winds occur, the ozone will peak in the early afternoon and decrease in the late afternoon as the contaminants are transported to the Southeast Desert.

Because sunlight is required to form ozone and the chemical reactions are not instantaneous, the greatest concentrations of ozone are usually downwind of urban centers and usually occur on summer afternoons when sunlight is most intense. Occasionally during the summer months ozone levels are built up in the valley floor and get transported with the upslope (mountain) flow during the day, creating exacerbated air quality conditions in the foothills and lower mountains of the Sierras. In fact, Sequoia/Kings Canyon and Yosemite National Parks periodically experience some of the worst air quality in the National Park Service.

In summer, as weather systems move through the area, a cycle of stable and less-stable air masses over the valley results in alternating periods of higher and lower ozone concentrations. During the winter months, a number of factors contribute to reduced ozone concentrations: clouds and fog block the required solar radiation at ground level, the sun angle is lower, the days are shorter, wintertime storms produce good dispersion conditions that inhibit the buildup of pollutants, and temperatures are not high enough to produce ozone in great quantities.

Ozone can irritate lung airways and cause inflammation much like a sunburn. Other symptoms include wheezing, coughing, pain when taking a deep breath, and breathing difficulties during exercise or outdoor activities. People with respiratory problems are most vulnerable, but even healthy people that are active outdoors can be affected when ozone levels are high. Repeated exposure to ozone pollution for several months may cause permanent lung damage. Anyone who spends time outdoors in the summer is at risk, particularly children and other people who are active outdoors. Even at very low levels, ground-level ozone triggers a variety of health problems including aggravated asthma, reduced lung capacity, and increased susceptibility to respiratory illnesses like chronic obstructive pulmonary disease, pneumonia, and bronchitis.

In setting the 8-hour ozone standard, EPA concluded that replacing the existing 1-hour standard with an 8-hour standard was appropriate to provide adequate and more uniform protection of public health from both short-term (1 to 3 hours) and prolonged (6 to 8 hours) exposures to ozone. In addition, the State adopted an 8-hour standard for ozone on April 28, 2005 of 0.070 ppm but the standard is not expected to become effective until early 2006.

Due to the fact that ozone is created over a period of time and sometimes miles downwind of the pollutant sources, ozone is considered a regional pollutant, i.e. entire regions are classified non-attainment. Ozone precursors can be transported well away from the source area before ozone concentrations peak. The SJVAB, which includes both valley and mountainous areas, has been designated as a “serious” non-attainment area for the Federal 8-hour ozone standard with an

attainment deadline of June 2013. The region is also designated non-attainment for the State 1-hour ozone standard.

PARTICULATE MATTER

Particle matter (PM) is a mixture of microscopic solids and liquid droplets suspended in air. Like ozone, PM is considered a regional pollutant in part because of its tendency to remain suspended in the air over long periods of time. PM 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. Small particles less than 10 micrometers in diameter pose the greatest problems because they can get deep into the lungs, and some may even get into the bloodstream. Exposure to such particles can affect both the lungs and the heart. Larger particles are of less concern, although they can irritate the eyes, nose, and throat. Particulate matter may be divided into many size fractions, measured in microns (a micron is one-millionth of a meter). CARB regulates two size classes of particles: particles up to 10 microns (PM_{10}) and particles up to 2.5 microns in size ($PM_{2.5}$). $PM_{2.5}$ particles are a subset of PM_{10}. **Figure 3.4-1** shows the relative sizes of particulate matter.

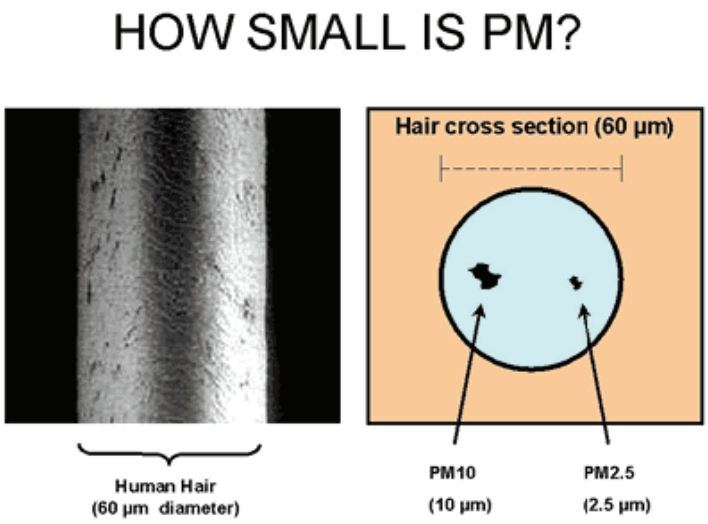


Figure 3.4-1 – Relative sizes of particulate matter pollution
Source: CARB, 2005.

Particle exposure can lead to a variety of health effects. For example, numerous studies link particle levels to increased hospital admissions and emergency room visits, and even to death from heart or lung diseases. Both long- and short-term particle exposures have been linked to health problems. Long-term exposures, such as those experienced by people living for many years in areas with high particle levels, have been associated with problems such as reduced lung function and the development of chronic bronchitis, and even premature death. Short-term exposures to particles (hours or days) can aggravate lung disease, causing asthma attacks and acute bronchitis, and may also increase susceptibility to respiratory infections. In people with heart disease, short-term exposures have been linked to heart attacks and arrhythmias. Healthy children and adults have not been reported to suffer serious effects from short-term exposures, although they may experience temporary minor irritation when particle levels are elevated.

EPA first established NAAQS for PM in 1971. The primary standards (measured by the indicator total suspended particulates or TSP) were 260 micrograms per cubic meter (µg/m^3), 24-hour average, and 75 µg/m^3, annual geometric mean. In 1987, EPA changed the indicator for particles from TSP to PM_{10}, the latter including particles with a mean aerodynamic diameter less than or equal to 10 µm, which delineates that subset of inhalable particles small enough to penetrate to the thoracic region of the respiratory tract. The standards were changed to 150 µg/m^3 for 24-hours and 50 µg/m^3 for annual geometric mean. In July 1997, while it was determined that the PM NAAQS should continue to focus on particles less than or equal to 10 µm in diameter, it was also determined that the fine and coarse fractions of PM_{10} should be considered separately. EPA recently promulgated a new standard for $PM_{2.5}$, or fine particulate matter. The new NAAQS were 65 µg/m^3 for a 24-hour sample, and 15 µg/m^3 for an annual arithmetic mean. Due to the fact that specific monitoring data did not exist at the time, official designations did not occur until December 17, 2004. Now that non-attainment designations have taken effect, the State and local governments have three years to develop implementation plans for reducing air pollutant emissions contributing to fine particle concentrations, in order to lower PM levels.

In 1982, CARB adopted California standards for PM_{10}, i.e. 50 µg/m^3 as a 24-hour average and 30 µg/m^3 as an annual geometric mean. On July 5, 2003 the State modified the PM CAAQS with a new $PM_{2.5}$ standard of 12 µg/m^3 as an annual arithmetic mean, lowered the annual average PM_{10} to 20 µg/m^3, and retained the 24-hour PM_{10}.

The SJVAB has an extensive network of PM_{10}/$PM_{2.5}$ monitors; however, there are no PM_{10} or $PM_{2.5}$ monitors within 20 miles of the Madera site and none within 30 miles of the North Fork site. The closest PM_{10}/$PM_{2.5}$ monitor to the Madera site is in Fresno on 1st Street, which is about 25 miles southeast, but since Fresno is a larger metropolitan area than Madera, the PM_{10}/$PM_{2.5}$ monitor in Merced, which is 29 miles northwest of the Madera site, would probably be more representative. The closest PM_{10}/$PM_{2.5}$ monitor to the North Fork site is in Clovis on Villa Avenue, approximately 31 miles south southwest.

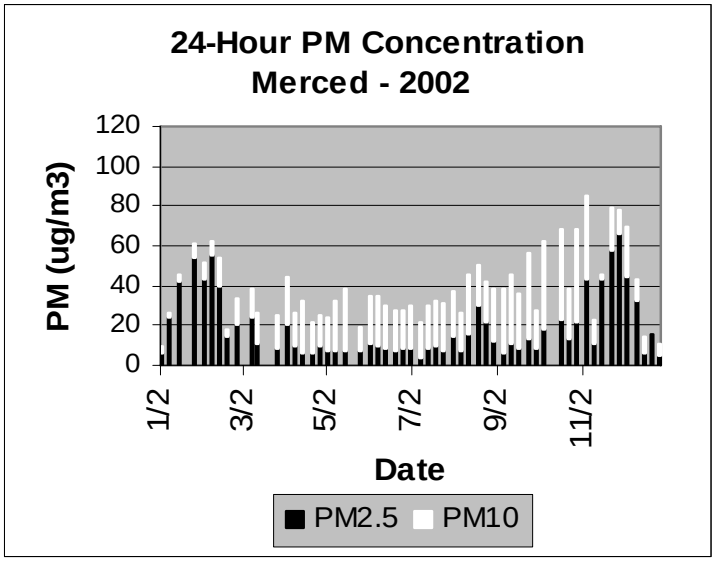


Figure 3.4-2 – Particulate matter concentrations in Merced in 2002
Source: CARB, 2005.

However, since the Clovis monitor is in the valley at only 86 feet elevation, it is not considered representative for the North Fork site area.

Figure 3.4-2 illustrates the variation in PM_{10} and $PM_{2.5}$ levels throughout 2002 in Merced. The total height of each bar represents the PM_{10} concentration, while the height of the black portion of each bar represents the $PM_{2.5}$ fraction. In Merced, the highest PM_{10} and $PM_{2.5}$ concentrations occurred during the winter. The colder, more stagnant conditions during this time of the year are conducive to the buildup of $PM_{2.5}$, including the formation of secondary ammonium nitrate. In addition, increased activity from residential wood combustion may also occur.

In contrast, the coarse fraction (particles between $PM_{2.5}$ and PM_{10} in size) was highest during the spring through the early fall. The coarse fraction is primarily due to activities that resuspend dust, such as emissions from paved and unpaved roads and construction. Based on 2000-2003 monitoring data, CARB estimates that throughout the entire valley portion of the SJVAB, $PM_{2.5}$ makes up approximately 70 percent of ambient PM_{10} during the winter (November through February). $PM_{2.5}$ makes up approximately 30 percent of ambient PM_{10} during the rest of the year. On an annual average basis, $PM_{2.5}$ makes up approximately 50 percent of ambient PM_{10}. Data does not exist to give a clear picture of the component make-up for the mountainous North Fork site area.

The County of Madera is designated non-attainment for the Federal PM_{10} standard and unclassifiable/attainment for the Federal $PM_{2.5}$ standard. It is classified non-attainment for both the State PM_{10} and $PM_{2.5}$ standards.

TOXIC AIR CONTAMINANTS

In addition to the above-listed criteria pollutants, Toxic Air Contaminants (TACs) are another group of pollutants of concern. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Cars and trucks release at least forty different toxic air contaminants. The most important, in terms of health risk, are diesel particulates, benzene, formaldehyde, 1,3-butadiene, and acetaldehyde. Public exposure to TACs can result from emissions from normal operations, as well as accidental releases. Health effects of TACs include cancer, birth defects, neurological damage, and death.

OTHER CRITERIA POLLUTANTS

The standards for nitrogen dioxide (NO_2), sulfur dioxide (SO_2), sulfates, hydrogen sulfide, vinyl chloride, lead, and visibility-reducing particles are being met or are unclassifiable in the Madera County area, and the latest pollutant trends suggest that these standards will not be exceeded in the foreseeable future. Madera County is designated attainment or unclassified for all other State and Federal standards.

INDOOR AIR QUALITY

The total quantity of air pollutants emitted indoors is less than that emitted by outdoor sources. However, once emitted, indoor air pollutants are diluted much more slowly, due to the partial trapping effect of the building shell. Additionally, indoor emissions occur in closer proximity to people; Californians, like others from industrialized nations, spend most of their time indoors. California adults spend an average of 87 percent of their time indoors, and children under 12 years of age spend about 86 percent of their time indoors. Most of the time spent indoors is spent in the home; however, working adults spend about 25 percent of their time at other indoor locations such as office buildings, stores, and restaurants, primarily for work, while children spend about 21 percent of their time in school on a school day. Because of these time budgets, the trapping effect of buildings, and people's proximity to indoor emissions, there is a much higher likelihood that people will be exposed to indoor pollutants than outdoor pollutants. Investigators have calculated that pollutants emitted indoors are 1,000 times more likely to be inhaled than those emitted outdoors (CARB, 2005b).

Chemicals found in indoor air pollution can cause a variety of impacts on human health, from irritant effects to respiratory disease, cancer, and premature death. Indoor air pollutants can be elevated to levels that may result in adverse health effects. The major indoor pollutants that can have a substantial impact on Californians' health are listed in **Table 3.4-4**, along with their sources and associated health impacts. The health impacts of greatest significance include asthma, cancer, premature death, respiratory disease and symptoms, and irritant effects.

TABLE 3.4-4
SOURCES AND POTENTIAL HEALTH EFFECTS OF MAJOR INDOOR AIR POLLUTANTS

Pollutant	Major Indoor Sources	Potential Health Effects Associated with One or More of The Pollutants Listed*
Asbestos	Building materials in older homes disturbed during renovation. Naturally occurring in some soils.	Lung cancer, asbestosis, mesothelioma.
Biological Agents (bacteria, fungi, viruses, house dust mites, animal dander, cockroaches, microbial VOCs)	House and floor dust; bedding; poorly maintained air conditioners, humidifiers, dehumidifiers; moist structures; insect infestation; building occupants; pets.	Allergic reactions; asthma; eye, nose, and throat irritation; humidifier fever, influenza, other infectious diseases.
Carbon Monoxide	Unvented/malfunctioning gas and propane appliances, woodstoves, fireplaces, tobacco smoke, vehicles in garages.	Headache; nausea; angina; impaired vision and mental functioning; fatal at high concentrations.
Endocrine Disruptors (PBDEs, some phthalates, some pesticides)	Flame retardants, plastics, pesticides.	Mimic or block natural effects of hormones (estrogen and others); developmental abnormalities.
Environmental Tobacco Smoke (ETS)	Cigarettes, cigars, and pipes.	Respiratory irritation, bronchitis and pneumonia in children; asthma in preschool children; lung cancer; heart disease; aggravated asthma; decreased lung function.

Pollutant	Major Indoor Sources	Potential Health Effects Associated with One or More of The Pollutants Listed*
Formaldehyde, Other Aldehydes	Composite wood products such as plywood and particleboard, furnishings, wallpaper, durable press fabrics, paints, combustion appliances, tobacco smoke.	Cancer; eye, nose, and throat irritation; headache; allergic reactions; aggravated asthma, decreased lung function.
Lead	Lead paint chips, contaminated soil.	Learning impairment.
Nitrogen Dioxide	Unvented or malfunctioning gas appliances, other combustion appliances.	Aggravated asthma; decreased lung function; eye, nose, and throat irritation; increased respiratory disease in children.
Organic Chemicals (benzene, chloroform, paradichlorobenzene, methylene chloride, perchloroethylene, others)	Solvents, glues, cleaning agents, pesticides, building materials, paints, treated water; moth repellents, dry-cleaned clothing, air fresheners.	Cancer; eye, nose, throat irritation; aggravated asthma; decreased lung function; at high levels: loss of coordination, damage to liver, kidney, brain.
Ozone	Infiltration of outdoor air, some air "purifiers", office machines.	Lung inflammation, aggravated asthma, cough, wheeze, chest pain.
Particulate Matter	Cigarettes, wood stoves, fireplaces, cooking, candles, aerosol sprays, house dust.	Increased mortality and hospital admissions; lung cancer; irritation; susceptibility to sinus and respiratory infections; bronchitis; aggravated asthma; decreased lung function.
Pesticides	Insecticides, herbicides, sanitizers or disinfectants used indoors or tracked in or blown in from outdoors.	Neurological impairment; nausea, headache, dizziness; skin and eye irritation; hormone disruption.
Polycyclic Aromatic Hydrocarbons (PAH)	Cigarette smoke, cooking, wood burning.	Cancer, gene mutation.
Radon	Uranium-bearing soil under buildings, groundwater, construction materials.	Lung cancer (especially in smokers).

NOTE: *When multiple pollutants are listed in a group, each pollutant may not cause all of the health effects listed in the third column.
SOURCE: CARB, 2005b.

GREENHOUSE GASES

Introduction

The Fourth Assessment Report, issued by the International Panel on Climate Change (IPCC) in 2001, anticipates that the average global temperature between the years 2000 and 2100 could rise from 0.6 (33.0) to 4.0 ^{o}C (39.2 ^{o}F) (IPCC, 2007). The extent to which human activities affect global client change is a subject of considerable scientific debate. While many in the scientific community contend that global climate variation is a normal cyclical process that is not necessarily related to human activities, the IPCC report identifies anthropogenic greenhouse gases (GHGs) as a contributing factor to changes in the Earth's climate (Michaels, 2004; IPCC, 2007).

Preferring to error on the side of caution, the analysis in this Environmental Impact Statement (EIS) assumes anthropogenic GHGs are in fact contributing to global climate changes.

The U.S. Supreme Court has affirmed the authority of the U.S. Environmental Protection Agency (USEPA) to list GHGs as pollutants under the Federal Clean Air Act (CAA). To date, however, regulatory action at the federal level has not occurred. The State of California, on the other hand, recently passed the Global Warming Solutions Act of 2006 (Assembly Bill 32 [AB 32]), legislation designed to result in substantial reductions GHG emissions generated by human activities in California.

The Greenhouse Effect and Climate Change

The Earth's temperature is regulated by a system known as the "greenhouse effect." GHGs are primarily water vapor (H_2O), carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) that trap the heat of the sun, preventing radiation from dissipating into space. Water vapor is the most abundant GHG and CO_2 is a distant second. Without the effect of these GHGs, which are both naturally occurring and anthropogenic, the average temperature on the Earth would be approximately –18 °C (-64.4 ^{o}F), instead of the current average of 15 °C (59 ^{o}F).

IPCC modeling estimates that anthropogenic CO_2 in the lower atmosphere has increased by approximately 31 percent since 1750. At the same time, average temperature in the lower atmosphere has increased approximately 0.6 (33.0) to 0.8 ^{o}C (33.4 ^{o}F). Due to the challenges inherent in modeling the complexities of the Earth's climate, the proportional importance of anthropogenic activities as opposed to natural feedback systems is exceptionally difficult to establish. Nonetheless, the IPCC concludes that "Most of the observed increase in globally-averaged temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic GHG concentrations." As noted above, this EIS assumes that an increase in anthropogenic GHG concentration is in fact contributing to global warming.

IPCC theorizes that a continuation of this warming trend could have profound implications, including flooding, erratic weather patterns, increased sea levels, and reduced arctic ice. The IPCC projects a number of future GHG emissions scenarios leading to a varying severity of impacts on the environment and the global economy. According to the 2007 IPCC report if anthropogenic GHG continue to increase in the atmosphere there will be a point at which the above impacts would become irreversible, this point is commonly referred to as the "tipping point." Although the 2007 IPCC Report states the tipping point may be as far off as 20 years, some experts contend the tipping point has already been reached.

Table 3.4-5 illustrates the state contribution to the global increase in GHG emissions. The 2020 estimates assume "business as usual." As shown, without modifications in human activities or the introduction of new technologies, GHG emissions are anticipated to increase.

TABLE 3.4-5
GLOBAL GREENHOUSE GAS EMISSIONS

Regions	Estimated GHG Emissions
	Million metric tons per year of CO_2e[1]
	1990
Global Emissions	626,395
California Emissions	427
	2020
Global Emissions	882,246
California Emissions	600

[1]Carbon Dioxide Equivalent (see methodology in Section 4.12)
Source: CARB, 2007; IPCC. 2007

3.4.4 EXISTING AIR QUALITY DATA

The following is a description of existing air quality conditions in the Madera County area.

Madera County Emissions Summary

Table 3.4-6 summarizes estimated 2004 emissions in tons per year and tons per day of key criteria air pollutants from major categories of air pollutant sources. For each pollutant, estimated emissions are presented for Madera County as a whole and no further spatial refinement is available (CARB, 2005).

Since ozone is a reaction between reactive organic gases (ROGs) and nitrous oxides (NO_x), to get a clearer picture of the relative contribution to ozone, you have to evaluate emissions of both. NO_x is primarily a product of complete combustion of fossil fuels, and on-road vehicular influence on Madera County emissions is apparent. On-road motor vehicles contribute 31.3% of the total NO_x. However, industrial processes contribute an additional 26.9%, and other mobile sources contribute an additional 22.1%. For the on-road motor vehicles component, the vast majority of NO_x comes from heavy-duty diesel trucks, while the industrial processes component is primarily made up of food and agricultural operations. The other mobile sources component's primary contributors are farm equipment and trains. ROG is largely an evaporative emission, albeit also from combustion sources; therefore major contributors are less definitive. The largest single category of ROG emissions is also from on-road motor vehicles, but with only 26.6% of the total. Miscellaneous processes add another 23.8% and other mobile sources add another 19.7%. The primary on-road motor vehicles component is light-duty autos and trucks; the

TABLE 3.4-6
MADERA COUNTY 2004 ANNUAL EMISSIONS IN TONS PER DAY *(tpd)* AND TONS PER YEAR (*tpy)*

Emission Category	ROG		CO		NO_x		PM_{10}		$PM_{2.5}$	
	tpd	tpy	tpd	tpy	tpd	tpy	tpd	tpy	tpd	tpy
Fuel Combustion										
Electrical Utilities	0.0	2	0.2	64	0.3	101	0.2	69	0.2	65
Cogeneration	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Oil and Gas Production (Combustion)	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Manufacturing and Industrial	0.0	3	0.1	27	0.6	225	0.0	10	0.0	10
Food and Agricultural Processing	0.1	48	0.6	208	1.5	555	0.1	38	0.1	37
Service and Commercial	0.0	4	0.1	22	0.5	168	0.0	7	0.0	7
Other (Fuel Combustion)	0.0	13	0.0	18	0.1	36	0.0	1	0.0	1
Waste Disposal										
Other (Waste Disposal)	0.0	4	0.0	0	0.0	0	0.0	0	0.0	0
Cleaning and Surface Coatings										
Laundering	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Degreasing	0.0	16	0.0	0	0.0	0	0.0	0	0.0	0
Coatings and Related Process Solvents	0.4	151	0.0	0	0.0	0	0.0	0	0.0	0
Printing	0.1	28	0.0	0	0.0	0	0.0	0	0.0	0
Adhesives and Sealants	0.0	10	0.0	0	0.0	0	0.0	0	0.0	0
Other (Cleaning and Surface Coatings)	0.1	53	0.0	0	0.0	0	0.0	1	0.0	1
Petroleum Production and Marketing										
Oil and Gas Production	0.0	1	0.0	0	0.0	0	0.0	0	0.0	0
Petroleum Marketing	0.3	120	0.0	0	0.0	0	0.0	0	0.0	0
Industrial Processes										
Chemical	0.1	19	0.0	0	0.0	0	0.0	1	0.0	1
Food and Agriculture	1.6	600	1.5	553	6.1	2,210	0.4	155	0.2	79
Mineral Processes	0.2	58	0.0	1	1.3	486	0.5	182	0.4	138
Metal Processes	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Wood and Paper	0.0	0	0.0	0	0.0	0	0.0	17	0.0	10
Glass and Related Product	0.0	3	0.1	54	1.4	518	0.1	54	0.1	51
Other (Industrial Processes)	0.0	1	0.0	0	0.0	0	0.0	13	0.0	9

Emission Category	ROG		CO		NO_x		PM_{10}		$PM_{2.5}$	
	tpd	tpy	tpd	tpy	tpd	tpy	tpd	tpy	tpd	tpy
Solvent Evaporation										
Consumer Products	1.0	363	0.0	0	0.0	0	0.0	0	0.0	0
Architectural Coatings and Related Process Solvents	0.4	151	0.0	0	0.0	0	0.0	0	0.0	0
Pesticides/Fertilizers	0.9	316	0.0	0	0.0	0	0.0	0	0.0	0
Asphalt Paving/Roofing	0.0	15	0.0	0	0.0	0	0.0	0	0.0	0
Miscellaneous Processes										
Residential Fuel Combustion	0.6	227	7.3	2,647	0.3	101	1.0	383	1.0	369
Farming Operations	2.7	990	0.0	0	0.0	0	5.6	2,027	1.4	517
Construction and Demolition	0.0	0	0.0	0	0.0	0	0.5	174	0.1	36
Paved Road Dust	0.0	0	0.0	0	0.0	0	4.2	1,520	1.8	667
Unpaved Road Dust	0.0	0	0.0	0	0.0	0	3.3	1,195	0.6	231
Fugitive Windblown Dust	0.0	0	0.0	0	0.0	0	2.2	803	0.5	177
Fires	0.0	2	0.1	20	0.0	1	0.0	3	0.0	3
Waste Burning and Disposal	1.1	391	10.1	3,672	0.5	190	1.3	466	1.2	440
Cooking	0.0	5	0.0	0	0.0	0	0.0	15	0.0	9
On-Road Motor Vehicles										
Light-Duty Passenger	1.6	579	16.6	6,041	1.6	585	0.1	25	0.0	15
Light-Duty Trucks	1.8	675	22.9	8,364	2.4	896	0.1	27	0.1	18
Medium-Duty Trucks	0.3	120	4.1	1,489	0.6	212	0.0	6	0.0	4
Light Heavy-Duty Gas Trucks	0.2	77	1.4	520	0.1	58	0.0	1	0.0	1
Medium Heavy-Duty Gas Trucks	0.2	85	1.8	643	0.1	41	0.0	0	0	0.0
Heavy Heavy-Duty Gas Trucks	0.2	67	3.2	1,172	0.2	86	0.0	0	0.0	0
Light Heavy-Duty Diesel Trucks	0.0	8	0.1	24	0.3	115	0.0	1	0.0	1
Medium Heavy-Duty Diesel Trucks	0.0	9	0.2	61	0.7	272	0.0	9	0.0	8
Heavy Heavy-Duty Diesel Trucks	0.2	71	0.8	303	3.6	1,300	0.1	32	0.1	27
Motorcycles	0. 1	38	0.8	306	0.0	8	0.0	0	0.0	0
Heavy Duty Urban Buses	0.1	46	1.2	443	0.2	89	0.0	1	0.0	1
School Buses	0.0	6	0.2	63	0.1	48	0.0	1	0.0	1
Motor Homes	0.1	23	1. 7	610	0.2	60	0.0	0	0.0	0
Other Mobile Sources										
Aircraft	0.1	20	1.7	631	0.0	2	0.0	3	0.0	2
Trains	0.1	29	0.3	106	1.9	694	0.1	19	0.0	18

Emission Category	ROG		CO		NO_x		PM_{10}		$PM_{2.5}$	
	tpd	tpy	tpd	tpy	tpd	tpy	tpd	tpy	tpd	tpy
Recreational Boats	1.5	540	9.0	3,285	0.4	147	0.1	41	0.1	31
Off-Road Recreational Vehicles	0.9	334	3.4	1,256	0.1	23	0.0	0	0.0	0
Off-Road Equipment	0.4	159	4.2	1,522	1.2	422	0.1	31	0.1	28
Farm Equipment	0.5	194	3.5	1,284	3.7	1,351	0.2	90	0.2	83
Fuel Storage and Handling	0.1	55	0.0	0	0.0	0	0.0	0	0.0	0
TOTAL	**18.4**	**6,727**	**97.0**	**35,408**	**30.1**	**10,971**	**20.3**	**7,424**	**8.5**	**3,095**

SOURCE: CARB, 2005.

primary miscellaneous processes components are farming operations, and waste burning and disposal; and the other mobile sources primary contributors are recreational boats and off-road recreational vehicles.

On road motor vehicles are the primarily contributor of CO in Madera County, with 56.2% of the total CO. Other mobile sources contribute an additional 22.7%. Again, light-duty vehicles and recreational boats are the major contributors.

Both PM_{10} and $PM_{2.5}$ are almost completely the result of miscellaneous processes (88.2% of PM_{10} and 77.8% of $PM_{2.5}$ emissions). The major contributors of PM_{10} emissions from miscellaneous processes are farming operations and paved road dust. Since $PM_{2.5}$ is more likely from combustion sources, the major contributors of $PM_{2.5}$ emissions from miscellaneous processes are farming operations, paved road dust, waste burning and disposal, and residential fuel combustion.

AIR QUALITY MONITORING

CARB and local air districts operate a regional monitoring network that measures the ambient concentrations of the six criteria pollutants. The major pollutants of concern in the project area are ozone, CO, and particulate matter. Existing and probable future levels of air quality in the project area can generally be inferred from ambient air quality measurements conducted by the SJVAPCD and CARB at their monitoring stations. There is only one monitoring site in the County of Madera. It is the Madera Pump Yard site, located at Avenue 8 and Road 29½ in Madera, about 11 miles south southeast of the Madera site but 38 miles southwest of the North Fork site. The Madera Pump Yard site measures ozone, nitrogen oxides (NO_2), and total non-methane hydrocarbons. Other stations affecting the Madera site are in the more metropolitan areas north and south of Madera. The nearest monitoring station that measures CO is the Fresno Skypark Site, which is located about 18 miles southeast of the Madera site on Chennault Avenue in Fresno. The Fresno Skypark Site monitors NO_2 and ozone as well as CO. The nearest particulate samplers are about 25 miles southeast of the Madera site in Fresno on North First Street and about 29 miles northwest of the Madera site in Merced on M Street.

The North Fork site is in a more rural mountainous setting. Monitoring is predominantly limited to the urbanized areas. In the SJVAB, the monitoring sites are almost exclusively on the valley floor. In fact, the nearest monitor of any kind to the North Fork site is in Clovis at an elevation of 85 feet. All the other sites mentioned with regards to the Madera site are between 35 and 55 miles from the North Fork site and, again, represent more urbanized conditions at elevations of less than 100 feet. The most representative monitoring station for the North Fork site would probably be the Turtleback Dome site in Yosemite. It is about 36 miles north northwest of the North Fork site and is at 1,746 feet elevation.

Table 3.4-7 provides the latest three-year summary of monitoring data for ozone, CO, PM_{10}, and $PM_{2.5}$ from these monitors.

When interpreting the data presented below, it is essential to understand the difference between an exceedance and a violation. An exceedance is any concentration that is higher than the level of the standard. In contrast, violations are a subset of the exceedances. A violation is any exceedance that is not affected by a highly irregular or infrequent event, and therefore cannot be excluded from the area designation process. An area is designated as non-attainment for a pollutant if air quality data show that a standard for the pollutant was violated at least once during the previous three calendar years. As explained above, exceedances that are affected by highly irregular or infrequent events are not considered violations of a standard and are not used as a basis for designating an area as non-attainment.

TABLE 3.4-7
AIR MONITORING RESULTS

Pollutant (Location)	CAAQS	NAAQS	2002	2003	2004
Ozone (Madera Pump Yard)					
Highest 1-Hour Average (ppm)	0.09	0.12	0.141	0.120	0.097
Highest 8-Hour Average (ppm)	0.070	0.08	0.110	0.102	0.084
Days > State 1-Hour Standard			21	15	3
Days > Federal 1-Hour Standard			2	0	0
Days > Federal 8-Hour Standard			18	14	0
Ozone (Fresno Skypark)					
Highest 1-Hour Average (ppm)	0.09	0.12	0.157	0.130	0.111
Highest 8-Hour Average (ppm)	0.070	0.08	0.132	0.112	0.095
Days > State 1-Hour Standard			66	35	16
Days > Federal 1-Hour Standard			15	1	0
Days > Federal 8-Hour Standard			78	32	12
Ozone (Yosemite Turtleback Dome)					
Highest 1-Hour Average (ppm)	0.09	0.12	0.106	0.135	0.137
Highest 8-Hour Average (ppm)	0.070	0.08	0.095	0.102	0.124
Days > State 1-Hour Standard			15	6	6
Days > Federal 1-Hour Standard			0	1	1
Days > Federal 8-Hour Standard			24	10	8
Carbon Monoxide (Fresno Skypark)					
Highest 8-Hour Average (ppm)	9.0	9	1.91	1.68	2.19
Days > State 8-Hour Standard			0	0	0
Days > Federal 8-Hour Standard			0	0	0
PM_{10} (Merced M Street)					
Highest State 24-Hour Average ($\mu g/m^3$)	50		88	75	57
Highest Federal 24-Hour Average ($\mu g/m^3$)		150	85	74	56
Calculated Days > State Standard			84.8	44.4	12.3
Calculated Days > Federal Standard			0	0	0
State Annual Average	20		39.6	32.7	28.7
National Annual Average		50	38.8	32.1	27.9
PM_{10} (Fresno First Street)					
Highest State 24-Hour Average ($\mu g/m^3$)	50		100	74	58
Highest Federal 24-Hour Average ($\mu g/m^3$)		150	96	74	54
Calculated Days > State Standard			90.4	79.6	30.2
Calculated Days > Federal Standard			0	0	0
State Annual Average	20		28.0	35.0	31.3
National Annual Average		50	38.9	34.7	30.9

$PM_{2.5}$ (Merced M Street)					
Highest Federal 24-Hour Average ($\mu g/m^3$)		65	66	46.7	53.1
Days > Federal Standard			1	0	0
State Annual Average	12		18.7	15.7	15.2
National Annual Average		15	18.8	15.7	15.2
$PM_{2.5}$ (Fresno First Street)					
Highest Federal 24-Hour Average ($\mu g/m^3$)		65	84	63	71
Days > Federal Standard			13	0	2
State Annual Average	12		N/A	17.7	16.8
National Annual Average		15	21.6	17.7	16.4

NOTES: The number of days that at least one measurement was greater than the level of the State or national standard is not necessarily the number of violations of the standard for the year, since the 1-hour and 8-hour standards can be violated more than once per day.
The 1-hour Federal ozone standard was in effect for these three monitoring years, even though it is now inapplicable.
ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter.
Calculated days = days above the standard if measurements were made on a daily basis (PM is normally only measured once every six days).
SOURCE: CARB, 2005.

Based on the data shown in **Table 3.4-7**, the following interpretations can be made:

- **Ozone Ambient Data**
  - While the Fresno station also showed 15 exceedances of the 1-hour ozone NAAQS in 2002, only 1 in 2003, and none in 2004, the Madera station only had 2 exceedances in 2002 and none in either 2003 or 2004.
  - The Yosemite station showed no exceedances of the Federal 1-hour standard in 2002 and only one per year in 2003 and 2004.
  - The Federal 8-hour ozone standard was exceeded many times at the Fresno station (from 78 times in 2002 to 12 times in 2004), but even though the Madera station also showed multiple exceedances of the standard in 2002 and 2003 (18 and 14 respectively), the site had no exceedances in 2004.
  - The Yosemite station had multiple exceedances of the Federal 8-hour standard in the three monitoring years (from 24 in 2002 to only 8 in 2004).

- **CO Ambient Data**
  - There were no exceedances of the CAAQS or NAAQS for CO at either monitoring station during the last three years.

- **PM_{10} Ambient Data**
  - The 24-hour Federal PM_{10} standard was not exceeded at either the Merced M Street monitoring station or the Fresno First Street station in 2002, 2003, or 2004.
  - The State 24-hour PM_{10} standard was exceeded at both stations in all three years. In fact, it was calculated that the State standard was exceeded on over 90 days per year in 2002 at the Fresno station and on almost 85 days per year at the Merced station in

2002. By 2004 those calculated exceedances were down to over 30 days per year at Fresno and to just over a dozen days per year at Merced.

- The State annual average for PM_{10} was exceeded in each year for which data were available.
- The Federal annual average PM_{10} was not exceeded at either site during 2002, 2003, or 2004.

- **$PM_{2.5}$ Ambient Data**
  - The Federal $PM_{2.5}$ 24-hour standard was exceeded at both the Fresno and Merced stations in 2002. Neither station exceeded the standard in 2003. In 2004 the Fresno station exceeded the standard while the Merced did not exceed it.
  - The annual averages for both the State and Federal standards were exceeded at both stations in all three years.

ODORS

Existing odor sources in the area of the Madera site are primarily limited to those associated with various agricultural activities, including fertilization and scattered cattle grazing activities. There is one potential odor source in the area of the Madera site. An existing facility that uses fiberglass in its product is located about a mile southeast. That facility is discussed in more detail below. During site visits, AES observed no detectable odors from the Madera site area.

Existing odor sources in the area of the North Fork site are limited. During site visits, AES observed no detectable odors from the North Fork site area.

TOXIC AIR CONTAMINANTS

A major source of toxics is defined as a source that emits 10 tons per year of any listed toxic air pollutant or 25 tons per year of a mixture of air toxics. An area source is defined as a source that emits less than these levels of air toxics and which is a concern because there are a large number of these small emitters within a single area. A search of the EPA Toxic Release Inventory shows a major source of toxic emissions located about a mile southeast of the Madera site. Florestone Products Company, located on Falcon Drive, is a manufacturing plant producing products like molded shower receptors, gel-coated fiberglass reinforced bathtubs, showers, tub/showers and whirlpools. The company also produces acrylic bathtubs, whirlpools, shower receptors and utility sinks and shower doors. Florestone was reported to have emitted over 50 tons of styrene in 2002 (EPA, 2005). The SJVAPCD (McVeigh, 2005) stated that the Florestone facility is not considered a “Hot Spot” at this time; styrene is exempt unless emitted in copious quantities.

No major source of toxics has been identified in the area surrounding the North Fork site.

SENSITIVE RECEPTORS

Current land uses in the vicinity of the Madera site are largely agricultural. There are some rural residential land uses near the northwest corner of the Madera site. Just southwest of the Madera site is another collection of rural residential land uses, near the northern entrance to the Madera Airport. Whereas there are mostly commercial operations immediately adjacent to State Highway 99 (SR-99) on the northeastern side, there is a collection of residential units west of the Madera site.

Several private and public school facilities are within a 3-mile radius of the Madera site. Two private schools are located about 2 miles east of the Madera site on Road 26 (Crossroads Christian and Madera Christian School); a private day care center is located about 3 miles southeast on Schnoor Street (Kiddie Kountry Club); and a Merced County Office of Education facility is located about 3 miles east on Road 26.

Current land uses in the vicinity of the North Fork site are largely open space and unused. There are few rural residential land uses in the area of the North Fork site.

3.5 BIOLOGICAL RESOURCES

The assessment of existing conditions and analysis of effects to biological resources was based upon biological field surveys conducted to document existing habitat types and determine the potential for occurrence of Federally listed species within the Madera and North Fork sites, and upon a review of the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants, California Department of Fish and Game (CDFG) Natural Diversity Data Base (CNDDB), and informal consultation with the U.S. Fish and Wildlife Service (USFWS) for reported occurrences of Federally listed species within the vicinity of the Madera site (**Appendix D**) and North Fork site (**Appendix G**). Biological surveys were conducted in 2004 at the Madera site (H. T. Harvey & Associates, 2004; **Appendix E**) and in 2005 at the North Fork site (H. T. Harvey & Associates, 2004; **Appendix H**). Biologists from Analytical Environmental Services (AES) obtained supplementary background information and surveyed the Madera site in 2004. H. T. Harvey & Associates conducted a wetland delineation of the Madera site in 2005 (**Appendix F**).

3.5.1 REGIONAL SETTING

MADERA SITE

The 305-acre Madera site is located approximately seven miles north of Madera, California, between Avenue 17 and Avenue 18, west of Highway 99 and the Union Pacific Railroad. The project vicinity is dominated by agriculture that includes dry land crops, vineyards, and orchards. The property is mostly flat and is situated at an elevation of 250 ft. San Joaquin sandy loam and areas of Atwater loamy sand, Hanford sandy loam, and Tujunga sandy loam underlie the site. The San Joaquin, Atwater, and Hanford soils are all underlain by hardpans, while the Tujunga soil is associated with former and current drainages and swales (H. T. Harvey & Associates, 2004; **Appendix E**).

A historic alignment of Schmidt Creek transects the property from the southeast corner of the site diagonally to the northwest along a narrow band of Tujunga and Hanford soils. The creek has been realigned as a ditch that extends to the western boundary of the parcel and beyond. The limited areas of existing development and Schmidt Creek Ditch are dominated by ruderal habitat. The remainder of the parcel is farmed.

NORTH FORK SITE

The 78.8-acre North Fork site is approximately two miles east of the foothill community of North Fork, east of Mammoth Pool Road, and 0.5 miles southwest of Hill 3954 (1.5 miles southwest of the village of Cascadel), in portions of sections 17, 20, and 21 in Township 8 South, Range 23 East, Mount Diablo Base Line and Meridian, Madera County, California. The property is on a southwest-facing slope with foothill woodland and interior live oak woodland habitats, situated at an elevation of 2,960 to 3,400 feet (H. T. Harvey & Associates, 2005; **Appendix H**).

3.5.2 VEGETATION COMMUNITIES

MADERA SITE

Vegetation communities occurring within the Madera site include dryland wheat (*Triticum aestivum*), ruderal/developed, Schmidt Creek Ditch and seasonal wetland depression. These plant communities are discussed below; acreage and percent area of vegetation types occurring within the Madera site are provided in **Table 3.5-1**. A vegetation map of the Madera site is presented as **Figure 3.5-1**.

TABLE 3.5-1
SUMMARY OF VEGETATION COMMUNITIES OF THE MADERA SITE

Habitat Type	Acres	Percent Area
Dryland Wheat Fields	292.5	96.0
Schmidt Creek Ditch and Seasonal Wetland Depressions	8.5	2.8
Ruderal/Developed	4.0	1.2
TOTAL	**305**	**100**

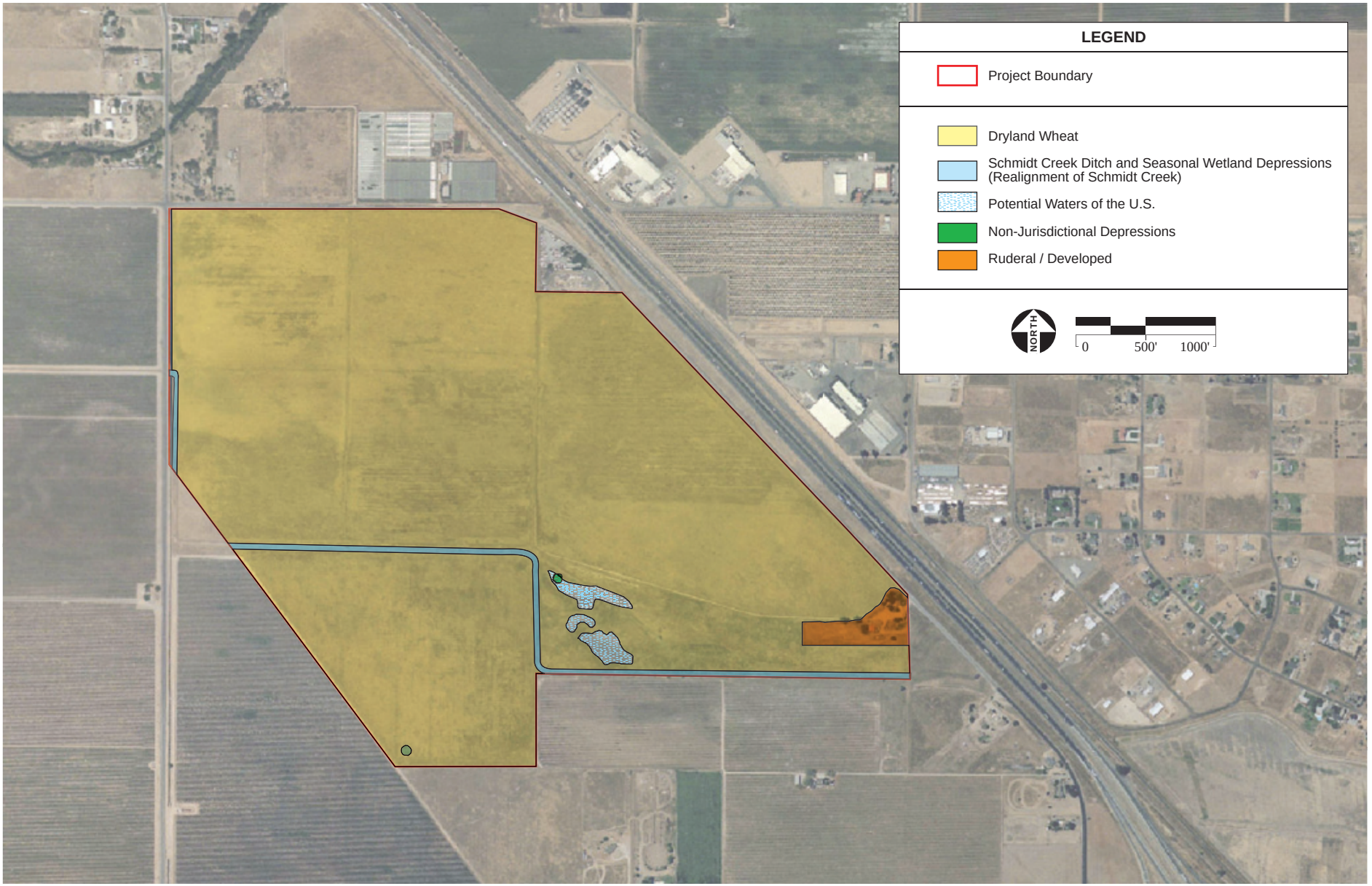
SOURCE: H. T. Harvey & Associates, 2004; AES, 2004.

Dryland Wheat Fields

Dry farmed wheat dominates the majority of the 305-acre site. Portions of the site were fallow at the time the surveys were conducted. Invasive forbs within the wheat fields included black mustard (*Brassica nigra*), charlock (*Sinapis arvensis*), wild radish (*Raphanus sativus*), and rancher's fireweed (*Amsinckia intermedia*) (H. T. Harvey & Associates, 2004; **Appendix E**).

Schmidt Creek Ditch and Seasonal Wetland Depressions

Schmidt Creek Ditch is a realigned channel of Schmidt Creek that was historically within a shallow swale of the site and flowed to the southeast according to the U.S. Geological Survey (USGS) Kismet quadrangle map. The realigned channel was excavated in upland as evidenced by its sandy bottom, and the sandy spoil side-cast (**Figure 3.5-2, Figure 3.5-3**). The floor of the ditch was dominated by rattail fescue (*Vulpia myuros*), ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), Bermuda grass (*Cynodon dactylon*), heliotrope (*Heliotropium curassavicum*), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), curly dock (*Rumex crispus*), and rancher's fireweed. A small thicket of willows (*Salix* spp.) and dead or dying Fremont cottonwood (*Populus fremontii*) was found along the eastern half of Schmidt Creek Ditch. An irrigation canal parallels Road 23 along the western edge of the property but it is not hydrologically connected with Schmidt Creek Ditch (**Figure 3.5-3**) (H. T. Harvey & Associates, 2004; **Appendix E**).



SOURCE: HT Harvey and Associates, 2005; AES, 2006

Figure 3.5-1
Habitat Map – Madera Site

Photograph 1 : Center of the site.

Photograph 2 : Schmidt Creek Ditch.

SOURCE: AES, 2006

Figure 3.5-2
Site Photographs – Madera Site

Photograph 3 : Schmidt Creek Ditch.

Photograph 4 : Irrigation Ditch control structure.

SOURCE: AES, 2006

Figure 3.5-3
Site Photographs – Madera Site

Two isolated depressions underlain by the Atwater and Hanford soils were found in the southern half of the property (**Figure 3.5-1**). Seasonal, water-loving plants including toad rush (*Juncus bufonius*), slender popcorn flower (*Plagiobothrys stipitatus*), rabbit-foot grass (*Polypogon monspeliensis*), and Italian rye (*Lolium multiflorum*) were the dominant vegetation in the depressions together with wheat and other annual grasses and forbs. A hardpan layer associated with the underlying soils may be responsible for winter ponding in these areas but the vegetation in these depressions is not representative of vernal pools or seasonal wetlands. Much of the underlying hardpan has been broken by repeated tillage over many decades, further increasing the drainage afforded by the sandy soils on site. While most of the southern half of the Madera site has a hardpan underlying the sandy soils, no other depressions or vernal pool topography were observed on the site (H. T. Harvey & Associates, 2004; **Appendix E**).

Disturbed/Ruderal

Disturbed/ruderal habitat within the Madera site is subject to substantial human activity and contains existing farm buildings and infrastructure such as farm roads and power lines. Vegetation and wildlife was similar to that found in the agricultural areas just described. In addition, willows, walnuts (*Juglans regia*), and blue gum (*Eucalyptus globulus*) exist around the ranch house. A dumping ground west of the ranch house was vegetated with rancher's fireweed (H. T. Harvey & Associates, 2004; **Appendix E**).

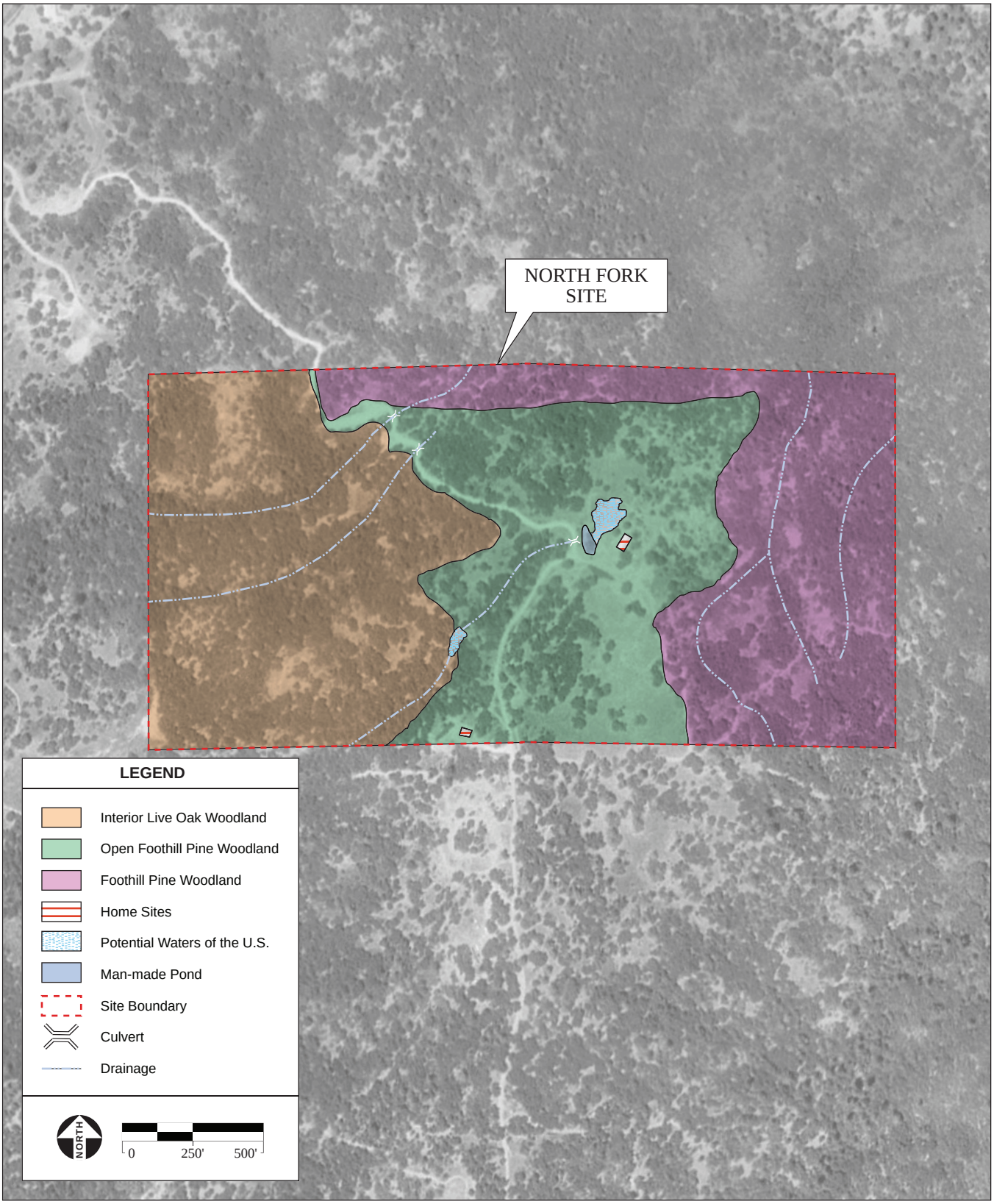
NORTH FORK SITE

Vegetation communities occurring within the North Fork site include foothill pine woodland, interior live oak woodland, open foothill pine woodland, and ruderal/developed. These plant community types are discussed below; acreage and percent area of vegetation types occurring within the site are provided in **Table 3.5-2**. A vegetation map of the North Fork site is presented as **Figure 3.5-4** and site photos are shown as **Figure 3.5-5**.

TABLE 3.5-2
SUMMARY OF VEGETATION COMMUNITIES OF THE NORTH FORK SITE

Habitat Type	Acres	Percent Area
Foothill Pine Woodland	21.9	27.8%
Interior Live Oak Woodland	30.1	38.2%
Open Foothill Pine Woodland	26.4	33.5%
Ruderal/Developed	.4	0.5%
TOTAL	**78.8**	**100**

SOURCE: H. T. Harvey & Associates, 2004; AES, 2004.



SOURCE: USGS Aerial Photograph, 7/16/1993; AES, 2006

Figure 3.5-4
Habitat Map – North Fork Site

PHOTO 1
General rancheria topography

PHOTO 2
Rancheria property-north entrance

PHOTO 3
View northeast uphill

PHOTO 4
View southwest towards southern boundary

SOURCE: AES, 2006

Figure 3.5-5
Site Photographs – North Fork Site

Foothill Pine Woodland

Nearly a third of the site consists of steeply sloped, heavily wooded foothill pine woodland, located on the eastern side and the northern edge of the site (**Figure 3.5-4**). The dominant tree species are foothill pine (*Pinus sabiniana*), interior live oak (*Quercus wislizenii*), and California buckeye (*Aesculus californica*). The trees form a continuous canopy with multiple layers. The shaded portions of the understory are dominated by poison oak (*Toxicodendron diversilobum*) and forbs such as tincture plant (*Collinsia tinctoria*) and torilis (*Torilis arvensis*). Wildflowers growing within the understory include wallflower (*Erysimum capitatum* ssp. *capitatum*) and harlequin lupine (*Lupinus stiversii*). Punctuated with few openings and where sunlight is permitted, various shrubs fill the landscape, shrubs that include mountain mahogany (*Cercocarpus betuloides* ssp. *betuloides*), yerba santa (*Eriodictyon californica*), California buckbrush (*Ceanothus cuneatus* ssp. *cuneatus*), and whiteleaf manzanita (*Arctostaphylos viscida*). Native and non-native grasses coexist in the shrub-dominated openings, including California brome (*Bromus californicus*), melic grass (*Melica imperfecta*), soft chess, and ripgut brome.

Interior Live Oak Woodland

A dense canopy of interior live oak covers approximately 30.1 acres of the western portion of the site (**Figure 3.5-4**). The community is dominated by interior live oak and California buckeye. Foothill pine is conspicuously absent from the interior live oak woodland. California buckbrush, whiteleaf manzanita, and a predominance of poison oak create high-density coverage within the understory, making it nearly impenetrable. Mountain misery (*Cnamaebatia foliolosa*), bedstraw (*Galium* spp.), and tincture plant are also common in the understory composition of vegetation. Granite outcrops characterize scattered openings in the landscape. Herbaceous species found in the open foothill pine woodland (see following paragraph) and other species associated with rock outcrops occupy these areas. Granite outcrop species include twining snakelily (*Dichelostemma volubile*), narrowleaf mule ears (*Wyethia angustifolia*), phacelia (*Phacelia* sp.), delphinium (*Delphinium* sp.), purple sanicle (*Sanicula bipinnatifida*), and slender cottonweed (*Micropus californicus*).

Open Foothill Pine Woodland

The central region of the site is an ecotonal region between the interior live oak woodland on the west and the foothill pine woodland on the east (**Figure 3.5-4**). For this reason, the open foothill pine woodland shares many of the same species as both adjacent community types. The approximately 26.4-acre region is characterized by large regions of non-native grassland, interspersed with foothill pine woodland and understory thickets of the associated shrub species. Additionally, other woody species occurring in the community include ponderosa pine (*Pinus ponderosa*), valley oak (*Quercus lobata*), blue oak (*Quercus douglasii*), flannelbush (*Fremontodendron californicum* ssp. *californicum*), and Mexican elderberry (*Sambucus mexicana*).

Non-native grassland is often associated with numerous species of showy-flowered, native annual forbs ("wildflowers"), especially in years of favorable rainfall. Germination occurs with the onset of the late fall rains; growth, flowering, and seed-set occur from winter through spring. With a few exceptions, the plants are dead through the summer-fall dry season, persisting as seeds. Grasses and forbs on site include soft chess, Italian rye, rattail fescue, wild oats (*Avena fatua*), fewflower clover (*Trifolium oliganthum*), and Indian clover (*Trifolium albopurpureum*). Wildflowers include Indian paintbrush (*Castilleja exserta*), Chinese houses (*Collina heterophylla*), purple globe-lily (*Calochortus amoenus*), fiestaflower (*Pholistoma auritum*), bird's eye gilia (*Gilia tricolor*), California dandelion (*Agoseris grandiflora*), and sky lupine (*Lupinus bicolor*).

Ruderal Disturbed

The disturbed portions of the North Fork site are associated with the main road that bisects the site, the central residence, and the southern residence. In cooperation with the Coarsegold Resource Conservation District, the Tribe maintains firebreaks along the main road. The breaks and road shoulder are vegetated with grasses and forbs identified in the previous paragraph.

3.5.3 WILDLIFE

MADERA SITE

Disturbed/ruderal portions of the site, such as the area around the ranch house, typically provide habitat for common species adapted to human disturbance. Common wildlife species, including backyard birds such as western scrub jay (*Aphelocoma californica*), American robin (*Turdus migratorius*), northern mockingbirds (*Mimus polyglottus*), house finches (*Carpodacus mexicanus*), and house sparrows (*Passer domesticus*) are likely visitors to the site from time to time.

Brush and debris piles provide habitat for western fence lizard (*Sceloporus occidentalis*) and desert cottontails (*Sylvilagus audobonii*). While the site may be too disturbed for most migrating birds, three species including Wilson's warbler (*Wilsonia pusilla*), western tanager (*Piranga ludoviciana*), and Bullock's orioles (*Icterus bullockii*) may be present during spring and fall migration (H. T. Harvey & Associates, 2004; **Appendix E**).

Cultivated fields also provide limited habitat for wildlife species. Frequent farming practices, plowing, and weed control disrupt fossorial mammals from colonizing farmed areas. Species that typically inhabit cultivated areas are generally common and accustomed to disturbances. These species include American kestrel (*Falco sparverius*), American crow (*Corvus brachyrhynchos*), killdeer (*Charadrius vociferous*), mourning dove (*Zenaida macroura*), western meadowlark (*Sturnella neglecta*), and Brewer's blackbird (*Euphagus cyanocephalus*).

NORTH FORK SITE

The North Fork site's rural setting in the Sierra Nevada Mountains provides a greater variety of wildlife species than the disturbed habitats of the Madera site. Year-round residents include western fence lizard, southern alligator lizard (*Elgaria multicarinata*), Sierra Nevada ensatina (*Ensatina eschscholtzii platensis*), king snake (*Lampropeltis getula*), gopher snake (*Pituophis catenifer*), western rattlesnake (*Crotalus viridis*), northern pygmy owl (*Glaucidium gnoma*), western screech-owl (*Otus kennicottii*), Anna's hummingbird (*Calypte anna*), acorn woodpecker (*Melanerpes formicivorus*), Nuttall's woodpecker (*Picoides nuttallii*), hairy woodpecker (*Picoides villosus*), northern flicker (*Colaptes auratus*), Hutton's vireo (*Vireo huttoni*), warbling vireo (*Vireo gilvus*), Cassin's vireo (*Vireo cassinii*), western scrub jay, oak titmouse (*Baeolophus inornatus*), white-breasted nuthatch (*Sitta carolinensis*), American robin, purple finch (*Carpodacus purpurens*), western gray squirrel (*Sciurus griseus*), dusky footed woodrat (*Neotoma fuscipes*), North American deer mouse (*Peromyscus maniculatus*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), bobcat (*Lynx rufus*), and mule deer (*Odocoileus hemionus*). Migratory birds breed in the habitats associated with the North Fork site. The Sierra Nevada Mountains provide breeding habitat for neotropical migrating birds including western wood-pewee (*Contopus sordidulus*), ash-throated flycatcher (*Myiarchus cinerascens*), orange-crowned warbler (*Vermivora peregrina*), black-headed grosbeak (*Pheucticus melanocephalus*), and lesser goldfinch (*Carduelis psaltria*). Winter visitors that breed in more northern latitudes or at higher elevations include red-breasted nuthatch (*Sitta canadensis*), yellow-rumped warbler (*Dendroica coronata*), white-crowned sparrow (*Zonotrichia leucophrys*), golden-crowned sparrow (*Zonotrichia atricapilla*), Cassin's finch (*Carpodacus cassinii*), pine siskin (*Carduelis pinus*), evening grosbeak (*Coccothraustes vespertinus*), Hammond's flycatcher (*Empidonax hammondii*), gray flycatcher (*Empidonax wrightii*), dusky flycatcher (*Empidonax oberholseri*), black-throated gray warbler (*Dendroica nigrescens*), and hermit warblers (*Dendroica occidentalis*). Bird species found in open areas include western bluebird (*Sialia mexicana*), California towhee (*Pipilo crissalis*), lazuli bunting (*Passerina amoena*), lark sparrow (*Chondestes grammacus*), and Bullock's oriole. Species found in drier conditions and associated with trees and shrubs include Phainopepla (*Phainopepla nitens*), blue-gray gnatcatcher (*Polioptila caerulea*), and rufous-crowned sparrow (*Aimophila ruficeps*) (H. T. Harvey & Associates, 2004; **Appendix H**).

3.5.4 SPECIAL-STATUS SPECIES

FEDERALLY LISTED SPECIES

For the purposes of this EIS, Federally listed species include those plant and animal species that are listed as endangered or threatened under the Federal Endangered Species Act (FESA), or are formally proposed for listing.

STATE-LISTED SPECIES

Other special-status species such as those plants and wildlife that, because of their recognized rarity or vulnerability to various causes of habitat loss or population decline, are recognized by State or other agencies, or by the California Native Plant Society (CNPS), or other conservation organizations. Species present on tribal trust land and recognized at the State or local level, are not necessarily afforded the protections of the Endangered Species Act.

METHODOLOGY

Special-status species that may potentially be affected by the Proposed Action were compiled based upon a review of pertinent literature, aerial photographs, site topographic maps, informal consultation with the USFWS and other local experts, results of a query of the CNDDB for reported occurrences of special-status species within the Madera and North Fork sites USGS 7.5" quadrangle and the eight surrounding quadrangles, and from the results of biological field surveys (**Appendix D** and **Appendix G**).

RESULTS

AES conducted reconnaissance level surveys on February 12, 2004 at the Madera site and H.T. Harvey and Associates conducted follow-up surveys on June 16, 2004. H.T. Harvey and Associates biologists conducted reconnaissance level surveys of the North Fork site on May 11 and 12, 2005. Surveys were conducted to assess the site for special-status species (State and Federally recognized and CNPS List 1B plants) and habitats able to support special-status species.

STATE AND CNPS SPECIAL-STATUS SPECIES

MADERA SITE

Based upon the methodology, as described above, to assess the Madera site for potential occurrences of special-status species, nine special-status plant species have the potential to occur on the Madera site: heartscale (*Atriplex minuscule*), subtle orache (*Atriplex subtilis*), Hoover's calycadenia (*Calycadenia hooveri*), Hoover's cryptantha (*Cryptantha hooveri*), gypsum-loving larkspur (*Delphinium gypsophilum* ssp. *gypsophilum*), Ewan's larkspur (*Delphinium hansenii* ssp. *exanianum*), spiny-sepaled button-celery (*Eryngium spinosepalum*), and large-flowered linanthus (*Linanthus grandiflorus*). While these species are listed under CNPS, they are not listed as endangered or threatened by the U.S. or by California. None of these species have been documented within five miles of the Madera site, and the highly-disturbed nature of the site and vicinity makes it unlikely the species would occur on the site.

Two sensitive habitats were identified in the CNDDB query: northern hardpan vernal pool and valley sacaton grassland. Neither of these sensitive habitats was observed on the Madera site. Most of the site is underlain by acidic iron and silica cemented hardpan, according to the soil

series descriptions (USDA, 1962). While this is characteristic of northern hardpan vernal pools geology, vernal pool topography and its associated vegetation were absent from the site. Fragments of hardpan geology were found along the southwest boundary and adjacent vineyard. However, they were likely surfaced when the adjacent parcel was ripped to install a vineyard.

State-listed wildlife species with the potential to occur on the Madera site and/or vicinity include Swainson's hawk (*Buteo swainsonii*), northern harrier (*Circus cyaneus*), California horned lark (*Eremophila alpestris actia*), and hoary bat (*Lasiurus cinereus*).

Swainson's Hawk *(Buteo swainsonii)*

Listed as threatened by the State of California, the Swainson's hawk occurs in the greater project area. Nesting is generally associated with riparian habitats in relatively close proximity to foraging habitat, preferably grassland or pasture habitat. They may range up to 18 miles from the nest in search of prey (Estep 1989; Babcock 1993). The Swainson's hawk prey base consists of voles (*Microtus* spp.), gophers, birds, and insects. They have adapted to foraging in certain croplands such as alfalfa, hay, and pasture. Crops such as grains, tomatoes, beets, and other row crops can also be used on an interim basis when prey is made available through harvesting activities. Crops such as cotton, corn, orchards, and vineyards are not suitable foraging habitat because the prey base is either absent or unavailable due to crop structure. Generally, crops greater than two feet tall create an impenetrable barrier for foraging Swainson's hawk (Estep, 1989).

Bald Eagle (*Haliaeetus leucocephalus*) (wintering and nesting)

The bald eagle was federally listed as endangered in 1967. It was reclassified as federally threatened in 1995 and was federally delisted in 2007. The bald eagle was state listed as endangered in 1982 and currently maintains its state status. Bald eagles typically breed in forested areas, relatively close (usually less than 2 km) to water that offers foraging opportunities. The bird feeds opportunistically, feeding on a variety of mammals and birds. However, it prefers fish, and seeks out aquatic habitats for foraging (Buehler, 2000). Potential nesting or foraging habitat is not found on the site.

Northern Harrier (*Circus cyaneus*)

Biologists from H.T. Harvey observed a northern harrier (California Species of Concern) foraging over the site. This species is found in open grasslands, agricultural areas, and marshes. Nesting habitat, which does not occur on the site, consists of long grass habitat and where marsh plants can provide cover for the nest, which is constructed on the ground. Suitable breeding habitat was not found on site. Foraging habitat for the northern harrier is similar to that of the Swainson's hawk, mentioned above. Harriers hunt in a slow traversing manner, in search of prey that includes rodents, birds, frogs, reptiles, and insects. Potential foraging habitat for the northern harrier exists on the project site.

California Horned Lark (*Eremophila alpestris actia*)

Horned larks (California Species of Concern) occur over nearly all of the contiguous United States in bare ground habitats. This subspecies breeds along the coast and in the Central Valley of California. Suitable habitat for this species includes fallow agricultural fields, which may occur on the Madera site.

Hoary Bat (*Lasiurus cinereus*)

The hoary bat (California Species of Concern) occurs over most of the contiguous United States and Hawaii. The species can be found throughout California, though less commonly in the deserts of southeastern part of the state. It prefers to forage in open and patchy habitats. The hoary bat roosts and rears young in dense tree foliage. Suitable roosting and rearing habitat is available in the small number of trees present on the Madera site.

NORTH FORK SITE

State and other special-status species were evaluated with the same methodology as performed for the Madera site. Twelve species have potential to occur on the North Fork site: tree anemone (*Carpenteria californica*), flaming trumpet (*Collomia rawsoniana*), Norris's beard-moss (*Didymodon norrisii*), Madera leptosiphon (*Leptosiphon serrulatus*), Yosemite lewisia (*Lewisia disepala*), orange lupine (*Lupinus citrinus* var. *citrinus*), King's River monkey flower (*Mimulus acutidens*), slender stalked monkey flower (*Mimulus gracilipes*), oval-leaved viburnum (*Viburnum ellipticum*), northern goshawk (*Accipiter gentilis*), and pallid bat (*Antrozus pallidus*). Those species with overlapping Federal status are not in the preceding list, but are discussed following **Table 3.5-4** in the **Federal Species** subsection.

Tree anemone, flaming trumpet, Norris's beard-moss, Madera leptosiphon, Yosemite lewisia, orange lupine, King's River monkey flower, slender stalked monkey flower, and oval-leaved viburnum are CNPS-listed plants. The survey performed by H.T. Harvey and Associates (May 11 and 12, 2005) was timed to occur within overlapping bloom periods for the tree anemone, Madera leptosiphon, Yosemite lewisia, orange lupine, King's River monkey flower, slender stalked monkey flower, and oval-leaved viburnum. Norris's beard moss is identifiable year-round, but no survey was done during the bloom period of flaming trumpet. No CNPS-listed plants were observed on the reconnaissance level surveys.

As well as special-status species, sensitive habitats are identified at the State level. Sensitive habitats identified in the region include: northern basalt-flow vernal pool, Central Valley drainage hardhead/squawfish stream, Central Valley drainage rainbow trout/cyprinid stream, and Central Valley drainage resident rainbow trout stream. The northern basalt-flow vernal pool habitat was not observed. The site has slopes between 15 and 45 percent and is underlain by highly permeable sandy soils, neither of which is conducive to the development of vernal pools. The sensitive stream habitats are discussed in the CNDDB 5-Mile Radius Map subsection.

State Special-Status Plant Species

Tree Anemone (*Carpenteria californica*)

State Status - Threatened

The tree anemone is found naturally only in the foothills of eastern Fresno County between the San Joaquin and Kings Rivers, at elevations from 1,500 to 4,000 feet. The most vigorous populations are found where moisture is relatively abundant, on north-facing slopes and in ravines. Native in decomposed granite but tolerates adobe and loam as well. The blooming period is from May to July.

Reconnaissance level surveys were conducted on May 11 and 12, 2005, within the blooming period for the species. Although this species is reported to occur within the 5-mile radius of the North Fork site (**Figure 3.5-6)**, H.T. Harvey and Associates did not observe the species on site.

State Special-Status Bird Species

Potential breeding habitat exists on the North Fork site for the northern goshawk in the open foothill pine woodland and the pine woodland habitats. The goshawk is an uncommon permanent resident in the mountains of California, and nests in, or within the vicinity of, coniferous forests. Nests are usually built on north slopes near water, and suitable nesting trees include red fir, lodgepole pine, Jeffrey pine, and aspens. This species was not observed during site surveys.

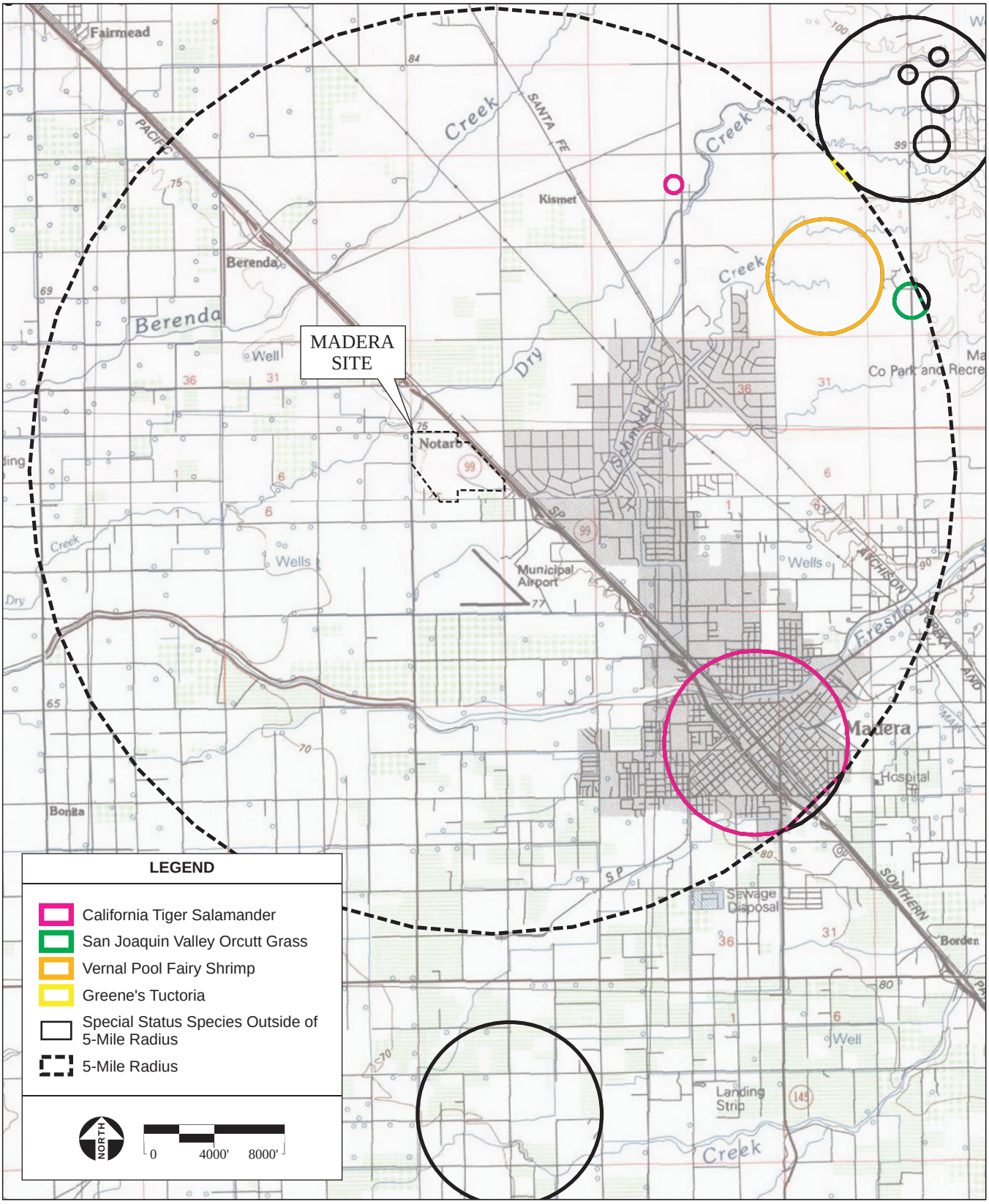
Bald eagle and American peregrine falcon are two raptor species identified by the USFWS as having potential to occur in Madera County. However, neither of these species was observed on the site survey and potential nesting and foraging habitat is absent from the site. Both species may, occasionally, fly over the site but no large water body is present. Large water bodies are frequently used by both birds of prey.

State Special-Status Bat Species

The pallid bat (*Antrozus pallidus*) has the potential to breed on the site. The pallid bat is usually found in rocky, montainous areas and near water. They are also found over more open, sparsely vegetated grasslands, and they seem to prefer to forage in the open. While no species-specific surveys were conducted for the pallid bat, this species was not observed during surveys of the North Fork site.

CNDDB 5-MILE RADIUS MAP – MADERA SITE

The CNDDB was queried and occurrences of special-status species plotted in relation to the study area boundary using GIS software (**Figure 3.5-6**). Within a 5-mile radius, seven special-status species have been reported by the CNDDB: Madera leptosiphon (*Leptosiphon serrulatus*), California tiger salamander (*Ambystoma californiense*), Greene's tuctoria (*Tuctoria greenei*), San Joaquin Valley orcutt grass (*Orcuttia inaequalis*), hairy orcutt grass (*Orcuttia pilosa*), burrowing



SOURCE: USGS 100K "Merced, CA" Topographic Quadrangle, T11S, T10S, & T9S; R16E, R17E, & R18E; USGS 100K "Mendota, CA" Topographic Quadrangle, T10S, T11S, & T12S; R16E, R17E, & R18E ; Mt. Diablo Baseline & Meridian; California Natural Diversity Database, 2004; AES, 2005

Figure 3.5-6
Special Status Species Found Within Five Miles of Madera Site

owl (*Athene cunicularia*), hoary bat (*Lasiurus cinereus*), moestan blister beele (*Lytta moesta*), and vernal pool fairy shrimp (*Branchinencta lynchi*). None of these species were observed on the site. Greene's tuctoria (*Tuctoria greenei*), San Joaquin Valley orcutt grass (*Orcuttia inaequalis*), hairy orcutt grass (*Orcuttia pilosa*), and vernal pool fairy shrimp (*Branchinencta lynchi*) are vernal pool endemic species would not occur due to lack of vernal pool habitat on the Madera site.

CNDDB 5-MILE RADIUS MAP – NORTH FORK SITE

The CNDDB was queried and occurrences of special-status species plotted in relation to the study area boundary using GIS software (**Figure 3.5-7**). Within a 5-mile radius, five special-status species have been reported by the CNDDB: Leech's skyline diving beetle (*Hydroporus leechi*), brook pocket-moss (*Fissidens aphelotaxifolius*), flaming trumpet (*Collomia rawsoniana*), foothill yellow-legged frog (*Rana boylii*), tree anemone (*Carpenteria californica*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), and western pond turtle (*Emys marmorata*). Flaming trumpet and brook pocket-moss are CNPS-listed plants, and were not observed on the reconnaissance-level survey.

In addition, three sensitive habitats were identified in the CNDDB query and within the 5-mile radius of the North Fork site: Central Valley drainage hardhead/squawfish stream, Central Valley drainage rainbow trout/cyprinid stream, and Central Valley drainage resident rainbow trout stream. Two of the six watershed drainages drain to Willow Creek, identified as Central Valley Drainage rainbow trout/cyprinid stream, and Whiskey Creek, identified as Central Valley drainage resident rainbow trout stream.

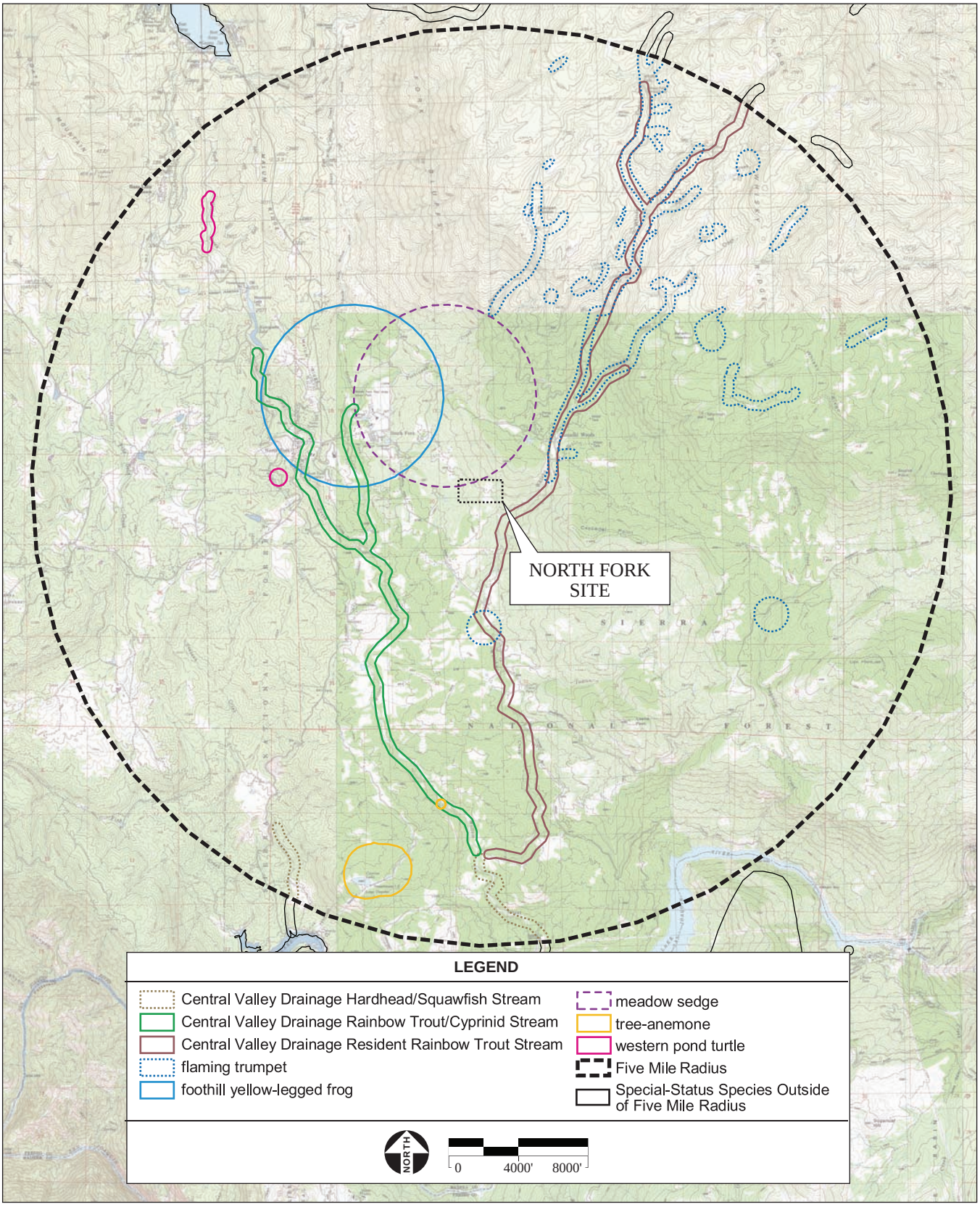
FEDERAL SPECIES

TARGET SPECIES LIST - MADERA SITE

Habitat requirements for each special-status species were assessed and compared to the habitats occurring within the property and adjacent areas. The target species list (**Table 3.5-3**) contains those Federal species that have suitable habitat on site.

Six species are listed at the Federal level and are discussed following **Table 3.5-3**. Of these six species, only the California tiger salamander (*Ambystoma californiense*) is known to occur within five miles of the site (CNDDB, 2006). Based upon information from the 2004 site surveys and the disturbed nature of the site (which is intensively farmed), none of these seven species occur on the site.

The property and/or surrounding vicinity represents potential habitat for seven Federal special-status species from the target species list. Federally listed vernal pool species, fish species, and



SOURCE: SOURCE: "Cascadel, CA" USGS 7.5 Minute Topographic Quadrangle, Sections 20 & 21, T8S, R23E Mt. Diablo Baseline and Meridian; California Natural Diversity Database; AES, 2006

Figure 3.5-7
Special Status Species Found Within Five Miles of North Fork Site

the valley elderberry longhorn beetle are Federal status species dismissed from the target species list. Identification of these species and rationale for exclusion from the target species list follows.

Federally Listed Vernal Pool Endemic Species

Federally listed vernal pool endemic species were not included in **Table 3.5-3**, as this community type was not observed on the Madera site (H. T. Harvey & Associates, 2004; **Appendix E**). Vernal pool species documented in the vicinity include vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardi*), conservancy fairy shrimp (*Branchinecta conservatio*), California linderiella (*Linderiella occidentalis*), midvalley fairy shrimp (*Branchinecta mesovallensis*), molestan blister beetle (*Lytta molesta*), hairy orcutt grass (*Orcuttia pilosa*), succulent owl's clover (*Castilleja campestris* ssp. *succulenta*), San Joaquin Valley orcutt grass (*Orcuttia inaequalis*), and Greene's tuctoria (*Tuctoria greenei*). Consequently, species that require vernal pools for all or part of their life cycle will not occur on the Madera site.

Federally Listed Fish Species

Federally listed fish species were excluded from the target species list (**Table 3.5-3)** due to lack of habitat. The Schmidt Creek realignment ditch is seasonal and is used to receive stormwater. It does not support persistent fish populations.

Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*)

The valley elderberry longhorn beetle (Federally threatened) has been documented on the San Joaquin River, north of Herndon. This species is parasitic to the host elderberry shrub (*Sambucus* spp). Elderberry shrubs were absent from the Madera site. This precludes the species from inhabiting the Madera site. Thus, it is not included on the target species list.

California Tiger Salamander (*Ambystoma californiense*)

Federal Status – Threatened

In the Central California foothills, California tiger salamanders (CTS) are typically found at low-elevations below 1,500 feet. CTS spend the majority of their lives in upland habitats such as annual grasslands, oak savanna, mixed grassland and woodland habitats, woodlands, scrub or chaparral habitats, plant communities associated with vernal pools, vernal pool complexes, and seasonal ponds. They utilize seasonal ponds, natural vernal pools, and vernal pool complexes for breeding during their aquatic phase.

TABLE 3.5-3
TARGET SPECIAL-STATUS SPECIES LIST: MADERA SITE

SCIENTIFIC NAME COMMON NAME	FEDERAL STATUS	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION
ANIMALS				
Amphibians				
Ambystoma californiense California tiger salamander	FT	Western California from Sonoma County in the north to Santa Barbara County in the south.	Breeds in vernal pools and ponds of grassland and open woodland of low hills and valleys. Will utilize burrows for refuge.	November to February (adults) March 15 to May15 (larvae)
Rana aurora draytonii California red-legged frog	FT	Currently found in coastal drainages from Marin County south to Baja California, Mexico. Range extends from the Bay Area and the central coast, also along the Sierra Nevada Range. Within the remaining distribution of the species, only isolated populations have been documented in the Sierra Nevada, northern Coast, and northern Transverse ranges. Believed to be extirpated from the southern Transverse and Peninsular ranges, but still present in Baja California, Mexico.	Lowlands and foothills in or near permanent or late-season sources of deep water with dense, shrubby, or emergent vegetation.	May to November
Reptiles				
Gambelia (= *Crotaphytus*) *sila* Blunt-nosed leopard lizard	FE	Southern San Joaquin Valley of California.	Semiarid grasslands, alkali flats, low foothills, canyon floors, large washes, arroyos. Usually on sandy, gravelly, or loamy substrate; sometimes on hardpan; most common where there are abundant rodent burrows; rare or absent in dense vegetation or tall grass.	March to September
Thamnophis gigas Giant garter snake	FT	Current distribution extends from near Chico, Butte County, to the vicinity of Burrel, Fresno County.	Generally inhabits marshes, sloughs, ponds, slow-moving streams, ditches, and rice fields which have water from early spring through mid-fall; emergent vegetation (such as cattails and bulrushes); open areas for sunning; and high ground for hibernation and escape cover.	March to October

SCIENTIFIC NAME COMMON NAME	FEDERAL STATUS	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION
Mammals				
Dipodomys nitratoides exilis Fresno kangaroo rat	FE	Historically, the San Joaquin Valley floor from about the Merced River, Merced County, on the north, to the northern edge of the marshes surrounding Tulare Lake, Kings County, on the south; and the valley floor's edge west to the wetlands of the Fresno Slough and San Joaquin River. Current distribution is greatly reduced.	Sands and saline sandy soils in chenopod scrub and annual grassland communities on the San Joaquin Valley floor. Recent occurrences have all been in alkali sink communities from 60 to 90 m.	All year.
Vulpes macrotis mutica San Joaquin kit fox	FE	Contra Costa County south to Kern County, California.	Alkali sink, valley grassland, foothill woodland. Hunts in areas with low sparse vegetation that allows good visibility and mobility.	All year.

NOTES:

FEDERAL STATUS CODES: (U.S. Fish and Wildlife Service or National Marine Fisheries Service)
FC = Federal candidate for listing
FE = Listed as endangered by the Federal Government
FLC = Federal species of local concern
FT = Listed as threatened by the Federal Government

The target species table does not include those species that are:

1) Listed as endangered or threatened under the California Endangered Species Act (or proposed for listing);
2) Designated as endangered or rare or species of concern, pursuant to California Fish and Game Code (§1901);
3) Designated as fully protected, pursuant to California Fish and Game Code (§§ 3511, 4700, or 5050);
4) Plants or animals that meet the definitions of rare or endangered under CEQA;
5) Plants listed as rare under the California Native Plant Protection Act; or
6) Plants considered by the California Native Plant Society (CNPS) to be "rare, threatened, or endangered in California" (Lists 1B, 2, and 4) or by other conservation organizations such as the Audubon Society or Western Bat Working Group.

SOURCE: USFWS, Sacramento Office, 2004; CDFG, 2004a, b, c, d; CNDDB, 2004 (Berenda and Kismet 7 ½-minute quadrangles); NatureServe 2004; H. T. Harvey & Associates, Inc., 2004 (**Appendix E**).

California tiger salamanders may use small artificial water bodies such as stock ponds. However these are often not optimum breeding habitat for the salamanders. The hydroperiod of stock ponds can be so short that larvae cannot metamorphose or so long that predatory fish and bullfrogs can colonize the pond. Periodic maintenance of stock ponds may also cause a temporary loss of functioning aquatic habitat. Successful breeding ponds for California tiger salamanders need to be inundated for a minimum of 12 weeks to allow for successful metamorphosis (USFWS, 2004b). Within the upland habitats, adult CTS spend part of their lives in the underground burrows of small mammals such as California ground squirrels and Botta's pocket gophers (*Thomomys bottae*) and are therefore rarely encountered even where abundant. This practice is termed aestivation.

The nearest reported occurrence is approximately 3.5 to 4 miles southeast in the town of Madera. Appropriate breeding and aestivation habitat are absent from the site and its immediate vicinity. The California tiger salamander, therefore, is absent from the site (H. T. Harvey & Associates, 2004; **Appendix E**).

California Red-legged Frog (*Rana aurora draytonii*)

Federal Status – Threatened

The California red-legged frog (CRLF) is brown to reddish brown in color with prominent dorsolateral folds and has diffuse moderate-sized dark brown to black spots that sometimes have light centers. Distribution of red or red-orange pigment is highly variable, but is usually restricted to the belly and the undersurfaces of the thighs, legs, and feet. The breeding period is from November to April.

Habitat of CRLF is characterized by dense, shrubby riparian vegetation associated with deep, still or slow-moving water. The shrubby riparian vegetation that structurally seems to be most suitable for CRLF is that provided by arroyo willow (*Salix lasiolepis*); cattails (*Typha* sp.) and bulrushes (*Scirpus* sp.). Although CRLF can occur in ephemeral or permanent streams or ponds, populations probably cannot be maintained in ephemeral streams in which surface water disappears.

The Madera site is located in Recovery Unit 1 – Sierra Nevada Foothills and Central Valley. Core areas – areas where recovery actions are focused – are not identified in Madera County. The Schmidt Creek realignment ditch provides marginal habitat for the red-legged frog. No frogs were observed on the surveys performed by AES and H.T. Harvey and Associates biologists in February and June of 2004, respectively.

Blunt-nosed Leopard Lizard (*Gambelia sila*)

Federal Status – Endangered

The blunt-nosed leopard lizard is a relatively large lizard with a long regenerative tail, long hind limbs, and a short, blunt snout. Adult males are slightly larger than females, ranging in size from 3.4 to 4.7 inches in length, excluding tail. Females are 3.4 to 4.4 inches long. There are no current overall population size estimates for the species. This species is found only in the San Joaquin Valley. It inhabits open, sparsely vegetated areas of low relief on the valley floor and the surrounding foothills. It also inhabits alkali playa and valley saltbush scrub. In general, it is absent from areas of steep slope or dense vegetation, or areas subject to seasonal flooding.

The density of vegetation on the Madera site, repeated disturbance associated with cultivation, and the paucity of small burrows preclude blunt-nosed leopard lizard from occurring on the site (H. T. Harvey & Associates, 2004; **Appendix E**).

Giant Garter Snake (*Thamnophis gigas*)

Federal Status – Threatened

Giant garter snakes can reach lengths of up to five feet. The dorsal side is brown with a yellow dorsal stripe and two paler lateral stripes. Ventral coloration is cream to olive color. Sexual maturity is reached at three years for males and five years for females. Mating occurs in March-April with a clutch size of 10 to 46.

The giant garter snake is an aquatic species showing a preference for marshes and sloughs as opposed to larger rivers and streams. The historic distribution is from the Sacramento and San Joaquin Valleys as far north as Butte County down to Kern County. Ideal identification period ranges from March to October. The giant garter snake relies on fish, amphibians, and amphibian larvae as a primary diet and hunts primarily during morning and evening hours. Nighttime hours are spent in mammal burrows for cover and refuge.

Though the Madera site is located within the San Joaquin Valley Recovery Unit, suitable habitat is not present on site. Schmidt Creek realignment ditch does not support flows or prey base for the survival of giant garter snake populations.

Fresno Kangaroo Rat (*Dipodomys nitratoides exilis*)

Federal Status – Endangered

The Fresno kangaroo rat historically occupied areas of grassland and chenopod scrub on the San Joaquin Valley floor from about the Merced River, Merced County, on the north, to the northern edge of the marshes surrounding Tulare Lake, Kings County, on the south; and the valley floor's edge west to the wetlands of the Fresno Slough and San Joaquin River. The subspecies' current distribution is greatly reduced. No known populations remain within the subspecies' historical range in Merced, Madera, and Fresno Counties. At least two populations are known to remain in Kings County. Outside of its historical distribution, but within Merced County, a population of

Dipodomys nitratoides exists, but it is uncertain whether it is of the *D. n. exilis* subspecies. The Fresno kangaroo rat occupies sands and sandy soils in chenopod scrub and annual grassland communities. Recent occurrences have all been in alkali sink communities between about 200 to 300 feet in elevation. The subspecies is nocturnally active year round (USFWS, 1998). Due to the historic farming practices associated with the site, suitable habitat is not present. The species was not observed on the surveys performed by AES and H.T. Harvey and Associates biologists, and suitable habitat was not found on the site.

San Joaquin Kit Fox (*Vulpes macrotis mutica*)

Federal Status – Endangered

The Federally endangered San Joaquin kit fox occurs in grasslands or grassy openings in shrubland. The site and vicinity possesses croplands dominated by orchards and vineyards. Croplands of the region are interspersed with smaller farm tracts of row crops and developed areas. The nearest reported occurrence is from grassland habitats approximately 11 miles southwest of the site.

Cultivation of the site has precluded formation of burrows for denning. The San Joaquin kit fox prey base, composed of small mammals such as California ground squirrels and kangaroo rats, are absent from the Madera site and vicinity. San Joaquin kit foxes do not occur on the Madera site (H. T. Harvey & Associates, 2004; **Appendix E**).

TARGET SPECIES LIST - NORTH FORK SITE

The North Fork site, located in the Sierra Nevada foothills, provides contrasting habitat for special-status species, compared to the Madera site. Habitat requirements for each special-status species found in the region were assessed and compared to the habitats occurring within the North Fork site and adjacent areas. The target species list (**Table 3.5-4**) contains those Federal species that have suitable habitat on site. **Table 3.5-4** identifies the scientific and common name, Federal status, habitat requirements, and ideal period of identification for each species.

The property and/or surrounding vicinity represents potential habitat for four Federal special-status species from the target species list.

Special Status Plant Species

The North Fork site has habitat for Mariposa pussypaws. As described in **Table 3.5-4**, habitats for this species are generally chaparral and cismontane woodland on granitic substrate. Due to the ecotonal habitats (as described in **Section 3.5.2**, Vegetation Communities) of the site and the relatively undisturbed nature, the site does provide habitat for this species. Reconnaissance level surveys performed by H.T. Harvey and Associates on May 11 and 12, 2005 did not detect any special-status plant species.

TABLE 3.5-4
TARGET SPECIAL-STATUS SPECIES LIST: NORTH FORK SITE

SCIENTIFIC NAME COMMON NAME	FEDERAL STATUS	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION
PLANTS				
Calyptridium pulchellum Mariposa pussypaws	FT	Fresno, Madera, and Mariposa counties. Elevation 400 to 1,220 m.	Chaparral and cismontane woodland on granitic or metamorphic substrate.	April to August
ANIMALS **Insects**				
Desmocerus californicus dimorphus Valley elderberry longhorn beetle	FT	Riparian forests of the Central Valley from Shasta County to Kern County.	Breeds and forages exclusively on elderberry shrubs (*Sambucus* spp.), specifically on stems with diameter of one inch or greater, below 800 m in elevation.	All year.
Amphibians				
Rana aurora draytonii California red-legged frog	FT	Coastal drainages from Marin County south to Baja California, Mexico. Range includes the San Francisco Bay area, central coast, and Sierra Nevada Range.	Lowlands and foothills in or near permanent or late-season sources of deep water with dense, shrubby, or emergent vegetation.	November to February (adults) March 15 to May15 (larvae)
Mammals				
Martes pennanti pacifica Pacific fisher	FC	Northwestern California, Cascade Range, and Sierra Nevada above 1,000 m.	Favors stands of pine, Douglas fir, and true fir.	Consult agency.

NOTES:

FEDERAL STATUS CODES: (U.S. Fish and Wildlife Service or National Marine Fisheries Service)
FC = Federal candidate for listing
FE = Listed as endangered by the Federal Government
FT = Listed as threatened by the Federal Government
FD = Delisted-Species will be monitored for 5 years

The target species table does not include those species that are:

1) Listed as endangered or threatened under the California Endangered Species Act (or proposed for listing);
2) Designated as endangered or rare or species of concern, pursuant to California Fish and Game Code (§ 1901);
3) Designated as fully protected, pursuant to California Fish and Game Code (§§ 3511, 4700, or 5050);
4) Plants or animals that meet the definitions of rare or endangered under CEQA;
5) Plants listed as rare under the California Native Plant Protection Act; or
6) Plants considered by the California Native Plant Society (CNPS) to be "rare, threatened, or endangered in California" (Lists 1B, 2, and 4) or by other conservation organizations such as the Audubon Society or Western Bat Working Group.

SOURCE: USFWS, Sacramento Office, 2004; CDFG, 2004a, b, c, d; CNDDB, 2004 (Berenda and Kismet 7 ½-minute quadrangles); NatureServe 2005; H. T. Harvey & Associates, Inc., 2004 (**Appendix D**); USFS, Pacific Southwest Region, 2005.

Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*)

Federal Status - Threatened

The valley elderberry longhorn beetle (VELB) is completely dependent on its host plant, elderberry (*Sambucus mexicana*), in California's Central Valley during its entire life cycle (USFWS, 1999). Valley elderberry longhorn beetle larvae live within the soft pith of the elderberry where they feed for 1 to 2 years. Adults emerge from pupation inside the wood of elderberry shrubs during the spring as the plant begins to flower. The adults feed on the elderberry foliage up until they mate. Females lay their eggs in the crevices of elderberry bark.

Upon hatching, the larvae then tunnel into shrub stems and feed there. The VELB typically utilize stems that are greater than one inch in diameter at ground level (USFWS, 1999). Due largely to the loss of riparian habitat within California's Central Valley, the VELB populations in the State had decreased to a point that in 1980 the USFWS listed the species as threatened pursuant to the Federal Endangered Species Act.

AES biologists Tim Armstrong and Sarah Shannon conducted an elderberry survey on October 17 and 18 of 2006. Elderberry shrubs (*Sambucus* spp.), the host plant for the VELB, were mapped along Mission Drive in the Open Foothill Pine Woodland habitat and in the eastern part of the Interior Live Oak Woodland habitat. The number of plants at each location, the size of the stems, and the presence or absence of VELB exit holes is provided in **Section 4.5**.

California Red-Legged Frog (*Rana aurora draytonii*)

Federal Status – Threatened

The California red-legged frog (CRLF) is brown to reddish brown in color with prominent dorsolateral folds and has diffuse moderate-sized dark brown to black spots that sometimes have light centers. Distribution of red or red-orange pigment is highly variable, but is usually restricted to the belly and the undersurfaces of the thighs, legs, and feet. The breeding period is from November to April.

Habitat of CRLF is characterized by dense, shrubby riparian vegetation associated with deep, still or slow-moving water. The shrubby riparian vegetation that structurally seems to be most suitable for CRLF is that provided by arroyo willow (*Salix lasiolepis*); cattails (*Typha* sp.) and bulrushes (*Scirpus* sp.). Although CRLF can occur in ephemeral or permanent streams or ponds, populations probably cannot be maintained in ephemeral streams in which surface water disappears, such as those within the North Fork site.

The North Fork site is located within Recovery Unit 1-Sierra Nevada Foothills and Central Valley. However, the site is not located within a core area, an area where recovery actions will be focused. CRLFs have been extirpated from the region.

Pacific Fisher (*Martes pennanti pacifica*)

Federal Status – Candidate

Habitat for this species varies from upland and lowland forests, including coniferous, mixed, and deciduous forests. The species commonly uses hardwood stands in summer, but prefers coniferous or mixed forests in the winter. Typically, open areas are avoided. Optimal conditions are forest tracts of 245 acres or more that are interconnected with other large areas of suitable habitat; a dense understory of young conifers, shrubs, and herbaceous cover is important in the summer. The fisher is adapted for climbing, but is primarily terrestrial. During inactive periods, the fisher resides in dens of tree hollows, under logs, in ground or rocky crevices, or in branches of conifers (warmer months).

The Pacific fisher was accorded Federal candidate status on April 8, 2004 (USFWS, 2004). A candidate is a species for which there is sufficient information to support a proposal to list the species under ESA as threatened or endangered, but the preparation of a proposal to list is precluded by higher priority listing actions. Candidate species do not receive the same Federal protection as listed species, but state and Federal agencies proposing activities within the historic range of the fisher are encouraged to give consideration to the fisher during the environmental planning process.

Reconnaissance level surveys have determined that it is unlikely that fishers utilize the North Fork site because it lacks a dense understory of young conifers and does not have a sufficient density of mature conifers.

3.5.5 WATERS OF THE UNITED STATES

According to the Code of Federal Regulations (33 CFR Part 328), the term "Waters of the United States" is defined 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; or
- All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use or degradation of which could affect interstate or foreign commerce including any such waters.

"Wetlands" are defined as:

Waters of the U. S. that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of

vegetation typically adapted for life in saturated soil conditions. Wetlands that meet these criteria during only a portion of the growing season are classified as seasonal wetlands.

MADERA SITE

H.T. Harvey and Associates conducted a delineation of waters of the U.S. occurring within the Madera site on April 13, 2005. The Identification of Waters of the U.S. Report was submitted to the U.S. Army Corps of Engineers on September 9, 2005 along with a letter requesting a jurisdictional determination. The jurisdictional determination letter, dated January 10, 2006 (file #200501033), in concurrence with the wetland delineation map, is shown in **Appendix F**.

Approximately 8.51 acres of potentially jurisdictional waters occupy the Madera site. Jurisdictional waters of the U.S. include 0.95 acres of wetlands throughout Schmidt Creek Ditch and 0.74 acres of seasonal wetland in the former Schmidt Creek watercourse. Additionally, jurisdictional "other waters" include 4.55 acres as tributary water throughout Schmidt Creek and ponding within the former Schmidt Creek watercourse and adjacent "wash" areas (2.27 acres). The hydrology supporting these areas is due to perching of incidental rainfall, storm water runoff, and ordinary high water flows in various areas of the current and former Schmidt Creek watercourses. Underlying hardpan forms the bed of the creek causing areas of deposited sands within the creek to remain saturated for extended periods during winter, sustaining emergent species well into the growing season. The depth to the underlying hardpan has also remained shallow under the former watercourse, resulting in an extended saturation period that allows seasonal hydrophytic vegetation to fluorish. Hardpan depth throughout the rest of the site is deep enough to preclude a higher water table, which inhibits wetland vegetation.

All identified waters of the U.S. are subject to USACE jurisdiction. An acreage estimate of waters of the U.S. within the project area is presented in **Table 3.5-5** below. **Figure 3.5-8** shows the waters of the U.S. occurring on the Madera site.

TABLE 3.5-5
WATERS OF THE U.S. ACREAGE ESTIMATE – MADERA SITE

Land Form	Acreage
Schmidt Creek Drainage Ditch	6.82
Wetlands	1.69
Total	**8.51**

SOURCE: H. T. Harvey & Associates, 2005; AES, 2004.

SOURCE: HT Harvey and Associates, 2004; AES, 2006

Figure 3.5-8
Waters of the U.S. – Madera Site

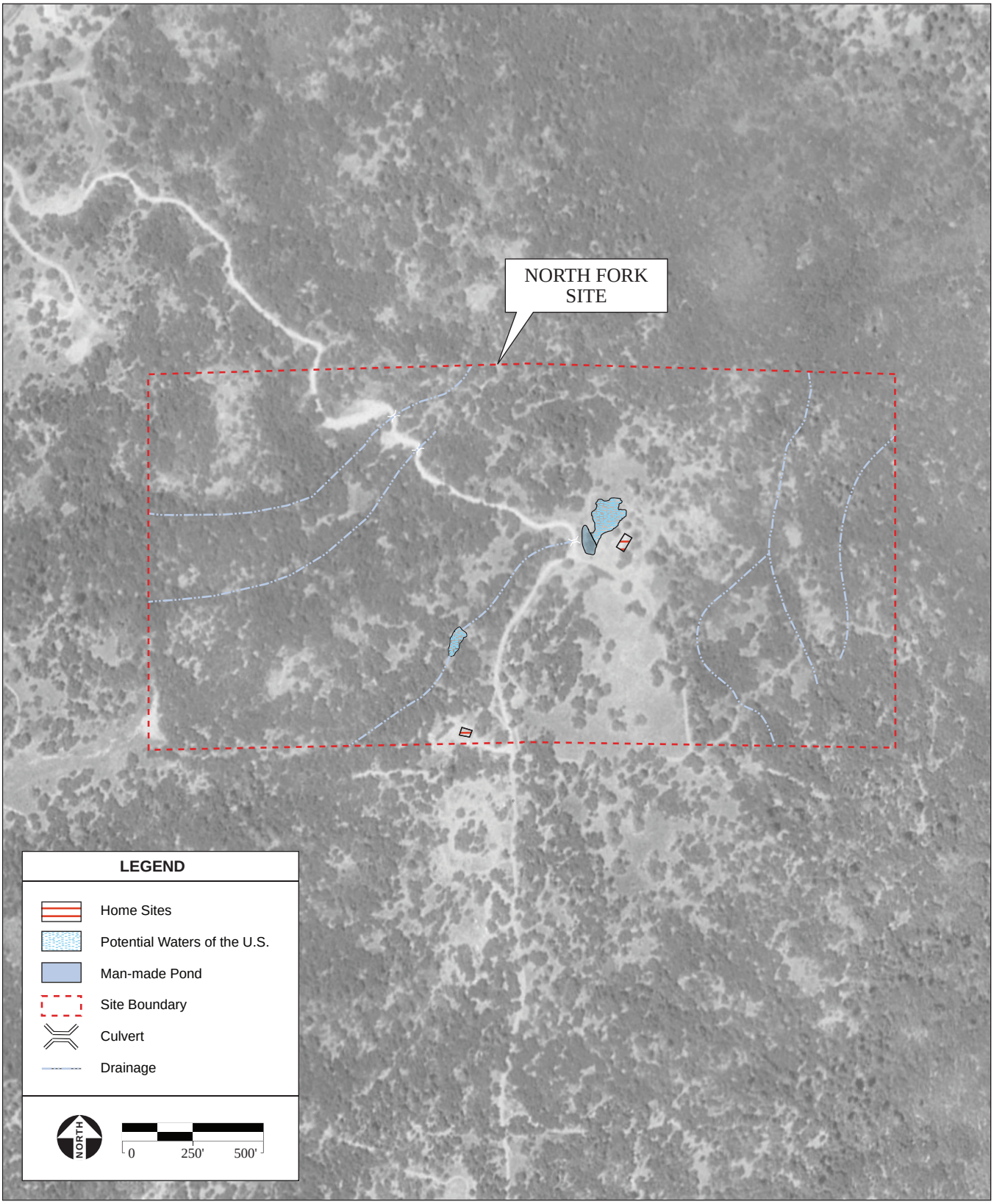
NORTH FORK SITE

H.T. Harvey and Associates, on May 11 and 12, 2005, conducted an assessment of wetlands occurring within the North Fork site. Six watershed drainages were observed on the site (**Figure 3.5-9**). The four drainages on the western side of the site drain into Willow Creek, while the two on the eastern side of the site drain into Whiskey Creek. Two of the drainages (one on the eastern side and one on the western side) are USGS (U.S. Geological Survey) blue-line streams. Due to the connectivity to identified waters of the U.S., all drainages are considered jurisdictional other waters of the U.S. The pond and potential wetlands located on the site occupy approximately 1.19 acres and are also hydrologically connected to waters of the U.S., and are therefore considered jurisdictional. An acreage estimate of waters of the U.S. within the site is presented in **Table 3.5-6** below.

TABLE 3.5-6
WATERS OF THE U.S. ACREAGE ESTIMATE – NORTH FORK SITE

Land Form	Acreage
Streams and other potential wetlands	1.11
Ponds	0.08
Total	**1.19**

SOURCE: H. T. Harvey & Associates, 2005; AES, 2004.



SOURCE: USGS Aerial Photograph, 7/16/1993; AES, 2006

Figure 3.5-9
Waters of the U.S. – North Fork Site

3.6 CULTURAL AND PALEONTOLOGICAL RESOURCES

This section provides a background assessment of cultural and paleontological resources in the vicinity of the Madera and North Fork sites. A cultural resources survey for the Madera and North Fork sites was prepared by Analytical Environmental Services (AES) in February 2005 and is summarized below. The cultural resources survey is presented as a confidential appendix to this EIS and is available to authorized parties under a separate cover.

A preliminary assessment of paleontologic sensitivity for the Madera and North Fork sites was also prepared by AES in February and April 2005 and is summarized below.

3.6.1 SETTING – MADERA COUNTY REGION

PREHISTORY

Madera Site Vicinity

The Madera site is located in the Central Valley archaeological region (San Joaquin Valley sub-region) of California (Moratto, 1984). South of Stockton, the Central Valley remains one of the least-known archaeological areas of the State due in part to the fact that large-scale excavations have been limited to early reservoir projects at the Buchanan, San Luis, Los Banos, and Little Panoche reservoirs (Moratto, 1984). Other work has included a few salvage archaeological projects around the Central Valley and at Buena Vista Lake. In addition to the paucity of archaeological research in the area, the depositional history of the central valley has likely caused archaeological evidence to be deeply buried under alluvium, particularly in the lower reaches of the San Joaquin and Sacramento river drainages and the Delta area where up to 10 meters of sediments have accumulated during the past 5,000 to 6,000 years (Moratto, 1984).

According to Fredrickson (1974) human history in California can be divided into three broad periods: the Paleoindian period, the Archaic period, and the Emergent period. This scheme used sociopolitical complexity, trade networks, population, and the introduction and variations of artifact types to differentiate between cultural units; the scheme remains the dominant framework for the prehistoric archaeological research in this region.

The Paleoindian period (12,000 to 8000 B.C.) was characterized by small, highly mobile groups occupying broad geographic areas. During the Archaic period, consisting of the Lower Archaic period (8000 to 5000 B.C.), Middle Archaic period (5000 to 3000 B.C.), and Upper Archaic period (3000 B.C. to A.D. 500), geographic mobility may have continued, although groups began to establish longer-term base camps in localities from which a more diverse range of resources could be exploited. The addition of milling tools, obsidian and chert concave-base points, and the occurrence of sites in a wider range of environments suggest that the economic base was more

diverse. By the Upper Archaic, mobility was being replaced by a more sedentary adaptation in the development of numerous small villages, and the beginnings of a more complex society and economy began to emerge. During the Emergent period (A.D. 500 to historic contact), social complexity developed toward the ethnographic pattern of large, central villages where political leaders resided, with associated hamlets and specialized activity sites. Artifacts associated with the period include the bow and arrow, small corner-notched points, mortars and pestles, and a diversity of beads and ornaments (Gerike et al., 1996:3.11-3.17).

North Fork Site Vicinity

The North Fork site is located in the Sierra Nevada archaeological region. The earliest residents in the general vicinity of the study area are represented by the Fluted Point and Western Pluvial Lakes Traditions, which date from about 11,500 to 7,500 years ago (Moratto, 1984). These early peoples are thought to have subsisted using a combination of generalized hunting and exploitation of plants and animals in nearby lakes (Moratto, 1984).

Early cultural assemblages were followed by an increase in Native population density approximately 7,500 years ago. In the Central Valley of California in the general vicinity of the North Fork site, aboriginal populations continued to expand between 6,500 and 4,500 years ago, with the possibility that Macro-Penutian-speaking arrivals (including Miwok, Yokuts and Nisenan) introduced more extensive use of bulbs and other plant foods, animal and fishing products more intensively processed with mortars and pestles, and perhaps the bow and arrow and associated small-stemmed and corner-notched projectile points. The peoples occupying the North Fork site area at the time of initial contact with European American populations were the Western Mono.

ETHNOGRAPHY

At the time of European contact, typical Native American occupation throughout the state was characterized by separate and politically autonomous nations first referred to by ethnologist A.L. Kroeber as “tribelets” (Kroeber, 1925; Moratto, 1984). Tribelets were typically governed by a chief and tended to have one or more permanent village sites with smaller seasonal/temporary camps scattered throughout the tribelet territory for food procurement. Tribelets sharing similar cultural elements and linguistic traits comprised “nonpolitical ethnic groups” and have been grouped by ethnologists into the language families we are familiar with today. It is understood today that the “boundaries” between language families were temporally and spatially fluid, with different groups occupying the same areas over time. Many distinctions made by the early ethnographers were more an exercise in organization than a real reflection socio-political identity.

The North Fork site is located in a larger transitional area between the Foothill and Northern Valley Yokuts language groups (Spier, 1978:471; Wallace, 1978:463) on the western side of the Sierra Nevada foothills as it transitions into the Great Central Valley. The area around the present city of Madera, three miles southeast of the Madera project site, was characterized as a hub of intertribal activity, including social, ceremonial, political, and economic exchange and interaction between the Yokuts and their neighbors. The Foothill Yokuts were a group of about 15 named tribelets that occupied the eastern Central Valley and surrounding Sierra Nevada foothills. Though loosely connected through trade and marriage, like their Monache neighbors to the east, there was no Yokuts nation or overarching political unity. The distinctions between groups were most obviously linguistic and territorial (Spier, 1978:426, 471; Wallace, 1978:462).

It has been estimated that at the time of European contact, the foothills of the Sierra Nevada were the most densely inhabited area in California. The Native American population of the region, comprised primarily of the Yokuts within the Valley and eastern Sierra foothills, Miwok to the north, and Monache to the east, was estimated to have exceeded 180 persons per square mile (Kroeber in Spier, 1978) with a total population of about 4,000 in 1770. Foothill Yokuts villages, like their neighbors, were small and loosely organized with no principal village site. Each village typically averaged approximately 13 individuals in anywhere from three to eight huts.

After AD 1770, Spanish colonial expeditions, along with the mission system and the Euroamerican invasion, caused great disruptions both in settlement patterns and population for the native Californians. Exposure to illnesses brought by the Spaniards, the Mexicans, and later the Americans, led to significant attrition rates due to diseases for which they had little or no immunity. The most significant impact came from the epidemic of 1833 (most likely malaria), which claimed an estimated 75% of the Central Valley's native inhabitants by 1846 (Moratto, 1984). Although some Foothill Yokuts became residents of the Tule River Indian Reservation, most settled in hamlets or isolated dwellings scattered throughout their traditional territory. Picayune, one such community near Oakhurst, had an estimated population 112 persons in 1950 (Spier, 1978:483). Early explorers and 20th century ethnographers have documented what remained of the Foothill Yokut culture post contact. Particulars of their material culture and society relevant to the identification of artifacts and features at the project site are described below.

Hunting, fishing, and gathering of plant foods comprised the subsistence strategy of the Yokuts. Seasonal movements to various elevations on the Sierra Nevada foothills were common to maximize the exploitation of resources. Deer were the primary game staple, hunted by stalking in disguise, driving into ambush, tracking, or trapping with a spring-pole device that caught the animal by the leg. Animals were also dispatched by the bow and arrow (Spier, 1978). Bears were hunted, being driven from their caves in the spring into hunting parties lead by a bowman.

Ground squirrels and rabbits were commonly smoked from their holes or pulled out by twisting long flexible sticks into their fur.

Acorns and pinenuts, after gathering, were stored in elevated granaries located near the dwellings. Manzanita berries were mashed and strained with water to create a beverage. Insects, grubs, seeds, and yucca roots were also eaten and honey was favored when it could be found (Spier 1978).

Obsidian was the principal material used for making stone tools, particularly for knives, scrapers, and projectile points. Bows were fashioned from California laurel or juniper wood. Steatite was a common material used in the making of cooking vessels. Most basketry produced by the Yokuts was similar in style to that of their immediate neighbors, the Monache. Baskets included twined burden-baskets, seed beaters, sieves, fan-shaped winnowers, coiled mush, storage or washing baskets, winnowing trays, and gambling trays. Woven textiles were not produced and although potsherds sporadically appear in archaeological contexts, Yokuts apparently did not make earthenware vessels, obtaining them instead through trade (Wallace, 1978:465).

Yokuts dwellings took any one of three forms; 1) a conical grass and willow twig-thatched house with excavated floor, 2) an oval grass-thatched house with a center ridgepole, or 3) an open, flat shade grass structure used as a shaded outdoor living and work place during the hot weather. Sweathouses, when present, constituted the other major structure of a village and were similar in construction to the oval house with a center ridgepole. The floor of the sweathouse was usually excavated several feet below grade and the roof was made saplings held under brush and covered with earth.

HISTORICAL CONTEXT

Madera County is located in the exact center of California, in the heart of the Central Valley and the Central Sierras (Madera, County of, 2004). It is one of the fastest growing counties in California. Fresno County borders on the south, Mariposa and Merced Counties on the north, and Mono County on the east.

Early Euro-American Exploration

The early Spanish expeditions into Alta California avoided the Madera area, hence no Spanish settlements existed there (Hoover, 1990). The geography of the County is largely responsible for its early isolation. "It was practically impossible to penetrate the tulares from the west or to cross the sloughs that covered the whole central portion of the San Joaquin Valley at high water" (Hoover, 1990). Early American explorers began cutting trails through Madera County as early as 1827 when Jedediah Strong Smith and later Kit Carson, as well as the Hudson Bay Company,

passed through the area in pursuit of beaver pelts (Hoover, 1990). However, the first record of the County was not made until John C. Fremont camped along the San Joaquin River on April 4 through 6, 1844, at a point near where State Route 145 crosses the river today (Hoover, 1990).

American Settlement

An early leader in the Madera area, James D. Savage arrived in California to work the southern mines and opened four trading posts, three in Madera County and one in Mariposa County, between 1848 and 1852 (Hoover, 1990). Savage is known to have employed Chinese to work the San Joaquin River for him and was at first involved in fighting the local Indians, but later befriended them, marrying at least five Indian girls, one from each of the neighboring tribes (Madera, County of, 2004).

In addition to Savage, other local ranchers hired Chinese laborers to clear their fields of rocks and to use them for boundary fences (Madera, County of, 2004). These dry-laid fences remain today and can still be seen in many areas across the County.

The town of Madera was laid out by the California Lumber Company in 1876 to take advantage of a settlement that had arisen where the Central Pacific Railroad Station met the terminus of a 63-mile flume descending from the wooded highlands (Hoover, 1990). When Madera County was created from a portion of Fresno County in 1893, the town of Madera was made the county seat; it continues to serve as the county seat today.

Mining Industry

With the discovery of gold in 1849, mines and mining settlements began springing up along the San Joaquin and Fresno rivers (Hoover, 1990). Mines were located around Coarsegold Gulch and Grub Gulch, along the Fresno River and Gold Creek near Hildreth (southeast of Oakhurst), and around Fine Gold Gulch (Madera, County of, 2004). Coarsegold, also known as Texas Flat for the five Texans that founded it, was the largest placer mining camp in Madera County. The name was changed to Coarsegold because the sand yielded extremely coarse particles of gold. This distinguished it from Fine Gold Gulch, 6 miles to the southeast (Hoover, 1990). The California Journal credits what is now Madera County with the production of $1,350,000 in gold between 1880 and 1892 (Madera, County of, 2004). Today, little trace remains of the many mining camps that at one time made up this district.

Madera County also produced quartz and copper mines in the mid to late 1800s, and, until the end of World War II (Hoover, 1990).

3.6.2 REGULATORY BACKGROUND

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 CFR 60.4 as follows:

> The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, association, and
>
> A. that are associated with events that have made a significant contribution to the broad patterns of our history;
>
> B. that are associated with the lives of persons significant in our past;
>
> C. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> D. that have yielded, or may be likely to yield, information important to prehistory or history.

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 National Register 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.

3.6.3 PREHISTORIC AND HISTORIC RESOURCES – MADERA SITE

RECORDS AND LITERATURE SEARCH

Methodology

A record search was completed at the Southern San Joaquin Valley Information Center (SSJVIC), of the California Historical Resources Information System (CHRIS) located at California State University, Bakersfield, by SSJVIC staff (SSJVIC File No. 04-026). Archaeological site base maps and records, survey reports, and other pertinent materials were reviewed. Sources of information included, but were not limited to, the listings of properties on the National Register of Historic Places (NRHP), California Historical Landmarks, California Register of Historical Resources, and California Points of Historical Interest as listed in the Office of Historic Preservation's Historic Property Directory for Madera County (OHP, 2004).

The Office of Historic Preservation has determined that structures in excess of 45 years of age should be considered potentially important historical resources, and former building and structure locations could be potentially important historic archaeological sites. Therefore, archival research included an examination of old maps to gain insight into the nature and extent of historical development in the general vicinity, and especially on the Madera site.

In addition, ethnographic literature that describes appropriate Native American groups, county histories, and other primary and secondary sources were reviewed.

Results

The results of the record search indicate that no portions of the Madera site have previously been surveyed. However, there has been one survey conducted adjacent to the Madera site (Hatoff, et al., 1995), and one survey conducted within one mile (Wadell Engineering Corporation, 1996).

No cultural resources have been recorded within the Madera site, or within one mile of the Madera site.

NATIVE AMERICAN CONSULTATION

A letter requesting a check of the sacred lands file for the Madera site was sent to the Native American Heritage Commission (NAHC) in February 2004. The NAHC responded indicating that they have no record of sacred lands within or near the Madera site. The NAHC also supplied the name of one Native American individual who may have knowledge of cultural resources in the project area. A letter requesting information about potential cultural resources on both the Madera and North Fork sites was sent to this individual on February 23, 2004. No responses were received. Copies of correspondence are located in **Appendices J** and **Q**.

FIELD SURVEY

Methodology

A reconnaissance level survey of the Madera site was conducted in March 2004 and an intensive level cultural resources survey was completed by AES cultural resources specialists Kelly Heidecker and Gary Arnold on February 9 through 10, 2005. The Madera site was examined by walking zigzag transects spaced approximately 25 meters apart; thick ground cover and standing water conditions prevented closer transects.

Based on archival review, it was anticipated that prehistoric resources were not likely to be encountered during a walkover survey of the site, and historic-period cultural resources would be present in the form of a ranching complex. Prehistoric archaeological site indicators include, but are not limited to: flakes and chipped stone tools; grinding and mashing implements such as slabs and handstones, and mortars and pestles; and locally darkened midden soils containing some of the previously listed items plus fragments of bone, shellfish, and fire-affected stones. Historic period site indicators generally include: standing structures, fragments of glass, ceramic and metal objects, milled and split lumber, and structure and feature remains such as building foundations and discrete trash deposits (e.g., wells, privy pits, dumps).

Department of Parks and Recreation (DPR) site recordation forms (DPR 523 forms) were prepared for each site located during the survey.

Results

One historical site was identified and recorded (AES-05-1 (Daulton Ranch)) during the field survey on February 10, 2005. Although the majority of the Madera site is now agricultural fields, remnants of Schmidt Creek, now channelized through the site, and standing water in many locations towards the south side of the property, indicate that the area retains much of its original

drainage patterns. Oral interviews with the current land tenant, who has lived on site for 10 years, indicated that the Madera site floods often during the winter months (Flower, pers. comm., 2005).

AES-05-1 (Daulton Ranch)

The site consists of the remnants of a farm complex intermixed with a modern prefab residential dwelling, Quonset hut, and ranching features in their original agricultural setting. The primary structures related to the historical period of the site include a barn and shed, both built circa 1953 (**Figure 3.6-1**). Personal communication with the current tenant indicated the farm was once owned by the Daulton family, who were early prominent local citizens (Flower, pers. Communication, 2005). This claim is further evidenced by the faint remains of the ranch name painted on the side of the shed, as can be seen **Figure 3.6-1, Photograph 2**.

Extant features of the historical farm complex include a large, gabled barn, a shed, and associated cattle-related features such as rail fencing that forms a corral and loading chute, and a large round water trough made of poured concrete. County records indicate that his barn was constructed in 1953, and field observations concur with that date.

The remnants of this historic farm complex were identified, recorded, and evaluated for its eligibility to the National Register of Historic Places (NRHP). The evaluation found that though the remains of the Daulton Farm are a resource representative of the theme of early ranching/agricultural development within the Central Valley (Criterion A), the integrity of the setting, association, and feeling, however, have been altered by the removal of the original residence and the introduction of a modern prefab dwelling and large Quonset hut being used as a workshop. While the remaining structures may appear to meet criterion A because of their association with the theme of early California farming, they do not portray the importance of this theme as well as might a farm where the original residence has not been replaced by a modern dwelling, etc. Moreover, the barn itself is not architecturally distinctive and has no intrinsic characteristics that set it apart from other vernacular barns in this area. Therefore, the evaluation of the historical and architectural significance of the Daulton Farm found that it does not meet the criteria for inclusion on the NRHP. This site is also located outside the developed area of the Madera site. Therefore, the proposed project would not affect known historic properties.

3.6.4 PALEONTOLOGICAL RESOURCES – MADERA SITE

INTRODUCTION

This section presents documentation on reported paleontological deposits on the Madera site and surrounding region, as well as an analysis on the potential for unreported paleontological

Photograph 1: Barn east end of corral view northeast

Photograph 2: North side of shed showing old ranch names

SOURCE: AES, 2006

Figure 3.6-1
Site Photographs

resources to be present on the Madera site. Paleontological resources are defined as the traces or remains of prehistoric plants and animals. Such remains often appear as fossilized or petrified skeletal matter, imprints or endocasts, and reside in sedimentary rock layers.

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.

REGULATORY BACKGROUND

The Antiquities Act of 1906 (PL 59-209; 16 United States Code 431 et seq.; 34 Stat. 225) calls for the protection of historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest on Federal land. Additional provisions appear in the Archaeological and Historic Data Preservation Act of 1974, as amended, for the survey, recovery, and preservation of significant scientific, prehistoric, historic, archaeological, or paleontological data, in such cases wherein this type of data might be otherwise destroyed or irrecoverably lost as a result of Federal projects.

REGIONAL CHARACTERISTICS

The Madera site lies within the Great Valley Geomorphic Province discussed in **Section 3.2**. The floor of this Province, younger in age than the upland areas of the Sierra Nevada Province, is comprised of alluvial sediments, which at varying depths throughout the County has compacted into sedimentary rock formations. While the formation of the Great Valley Province began in the late Jurassic period, the landmass that eventually became the valley was under seawater until approximately 5 million years ago, when deposition and uplifting transformed it into habitat area for Pliocene and latter-epoch flora and fauna.

DATABASE SEARCH

Evidence for the age range of the valley portion of Madera County appeared in findings during a database search of the University of California Museum of Paleontology (UCMP) in April of 2005. Late Cretaceous period documentation for the County's valley portion is limited to several species of bivalves, related to clams, scallops and oysters. Fossils of Tertiary age (approximately 65 million years ago to 1.5 million years ago), when larger mammals became prevalent on land, are limited to *Trochocyathus californianus*, a type of fossil corralite.

Records for terrestrial mammals and other fossil specimens of Quaternary age (1.5 million years ago to present) appear within 6 miles of the Madera site at the Fairmead Landfill. The Fairmead Landfill has produced an abundance of Pleistocene-epoch mammals, reptiles and birds. To date over 15,000 specimens have been discovered at depths of 10 to 60 feet over a 14-acre area. Only 190 entries for this site appeared in the UCMP online database at the time the records search was conducted. The full extent of the site is not yet known.

FIELD SURVEY

No evidence of fossils on the Madera site was observed during the Cultural Resources survey conducted on February 9 and 10, 2005. However, surface and subsurface sandstone and hardpan clumps of various sizes were observed to be fairly ubiquitous. Subsurface probing with hand trowels revealed that hardpan layers are present in some places to within 10 centimeters below ground surface. The hardpan observed was reddish in color, and as such likely originated in the mafic rock formations in the Sierra Nevadas to the east.

POTENTIAL FOR FOSSIL DISCOVERY

Based on the age range of the Great Valley formation, and on the extent of paleontological discovery in the vicinity of the Madera site, there is potential for subsurface Pleistocene-epoch fossils to be present on the Madera site. Such fossils would be present below the levels that have been disturbed by grading and tilling.

3.6.5 PREHISTORIC AND HISTORIC RESOURCES – NORTH FORK SITE

RECORDS AND LITERATURE SEARCH

Methodology

A records search was completed at the Southern San Joaquin Valley Information Center (SSJVIC), of the California Historical Resources Information System (CHRIS) located at California State University, Bakersfield, by SSJVIC staff (SSJVIC File No. 05-033). Archaeological site base maps and records, survey reports, and other pertinent materials were reviewed. Sources of information included, but were not limited to, the listings of properties on the National Register of Historic Places (NRHP), California Historical Landmarks, California Register of Historical Resources, and California Points of Historical Interest as listed in the Office of Historic Preservation's Historic Property Directory for Madera County (OHP, 2005). Historic maps, plats, and aerial photographs were also reviewed to gain insight into the nature and extent of historical development in the general vicinity, and especially on the North Fork site.

In addition, ethnographic literature that describes relevant Native American groups, county histories, and other primary and secondary sources were reviewed.

Results

The results of the records search indicate that portions of the property have been subjected to two previous cultural resources studies (Francis, 2000; Napton and Greathouse, 1995). Napton and Greathouse (1995) conducted a linear survey of a proposed fuel break project that bisected the North Fork site. No cultural resources were identified. In 2000, Francis surveyed the complete property as part of fire pre-suppression project. Seven archaeological resources were identified within the property (see **Table 3.6-1**).

TABLE 3.6-1
RESOURCES IDENTIFIED WITHIN THE NORTH FORK SITE

Resource I.D. #	Description
P-20-2353	Prehistoric bedrock mortar outcrop
P-20-2354	Prehistoric bedrock mortar outcrop, lithic scatter, midden deposit, historic-period debris scatter
P-20-2355	Historic-period water conveyance ditch
P-20-2356	Prehistoric bedrock outcrop, lithic scatter, midden deposit
P-20-2357	Possible historic-period mining feature
P-20-2358	Prehistoric bedrock mortar outcrop, lithic scatter
P-20-2359	Prehistoric bedrock mortar outcrop, lithic scatter, midden deposit, historic-period debris scatter

SOURCE: Francis, C.W. 2000.

NATIVE AMERICAN CONSULTATION

Please refer to **Section 3.6.3** for a detailed discussion of the Native American consultation process.

FIELD SURVEY

Methodology

A reconnaissance level cultural resources survey of the North Fork site was completed by AES cultural resources specialist Kelly Heidecker on February 15, 2005. At that time, the North Fork site was examined by walking zigzag transects spaced approximately 15 meters apart in areas accessible to pedestrian survey, which comprised approximately 20 acres of the 80-acre site. The remaining 60 acres were not surveyed due to steep slopes, rocky terrain, and heavy undergrowth.

Based on archival review, it was anticipated that prehistoric and historic period resources might be encountered during a walkover survey of the site. Prehistoric archaeological site indicators include, but are not limited to: flakes and chipped stone tools; grinding and mashing implements such as slabs and handstones, and mortars and pestles; and locally darkened midden soils containing some of the previously listed items plus fragments of bone, shellfish, and fire affected stones. Historic period site indicators generally include: standing structures, fragments of glass, ceramic and metal objects, milled and split lumber, and structure and feature remains such as building foundations and discrete trash deposits (e.g., wells, privy pits, dumps).

Results

No cultural resources were identified during the survey conducted on February 15, 2005. The poor visibility due to dense vegetation and steep terrain limited the field survey to the centrally located meadow area and areas surrounding it. None of the cultural resources identified in the records search are located in the meadow area or other areas surveyed during the field visit.

3.6.6 PALEONTOLOGICAL RESOURCES – NORTH FORK SITE

REGIONAL CHARACTERISTICS

The North Fork site lies within the Sierra Nevada Geomorphic Province in **Section 3.2**. This Province is considerably older in age than the lowland areas of the Great Valley Province. It is composed primarily of granite and granitic intrusive igneous formations, which formed as a result of magma displacement caused by the subduction of the Farallon Plate in the formation of California. Subsequent erosion and Pleistocene glacial activity have stripped the older top layers from the Sierra Nevada, and regional freeze and thaw patterns have washed the matter as alluvium into the lower elevations, including the Great Valley Province.

DATABASE SEARCH

A database search of the University of California Museum of Paleontology (UCMP) was conducted by AES in April of 2005. The UCMP database did not reflect any paleontological data for the Sierra Nevada Province.

FIELD SURVEY

No paleontological resources were identified during the field survey conducted on February 15, 2005.

Potential for Fossil Discovery

Fossil discovery on the North Fork site is unlikely. Surface soil conditions are likely too young to bear materials of paleontological nature. Soil layers likely to contain fossils have already eroded into the valley below. The granite formations beneath the North Fork site would not support fossil formation.

3.7 SOCIOECONOMIC CONDITIONS AND ENVIRONMENTAL JUSTICE

3.7.1 SOCIOECONOMIC CHARACTERISTICS OF MADERA COUNTY

POPULATION

Regional Population

As shown in **Table 3.7-1**, the 2005 population of Madera County is estimated to be 141,007. The majority of the regional population resides in unincorporated Madera County.

TABLE 3.7-1
REGIONAL POPULATION

Location	Population		
	1990	2000	2005*
Madera County (total)	**86,400**	**123,109**	**141,007**
Chowchilla	5,875	14,416	16,065
Madera	28,800	43,205	50,842
Unincorporated County	51,700	65,488	74,100
State of California (total)	**29,758,213**	**33,871,648**	**36,810,358**

NOTES: * Estimate.
SOURCE: California Department of Finance, 2005.

The Cities of Madera and Chowchilla are the only incorporated communities in the County. Madera, the County seat, is home to more than three times the population as in the City of Chowchilla. Both the Madera site and the North Fork site are located in unincorporated Madera County. The Madera site is located adjacent to the City of Madera and near the City of Chowchilla. The North Fork site is located near the unincorporated community of North Fork and is relatively distant from the Cities of Madera and Chowchilla.

Population Trends

The population of Madera County grew rapidly from 86,400 people in 1990 to 123,109 people in 2000, an increase of 42.5 percent. Between 2000 and January 2005, the County's population is estimated to have grown to 141,007, a slightly more moderate increase of approximately 14.5 percent.

The populations of Chowchilla and Madera also increased rapidly from 1990 to 2000. The population of Chowchilla more than doubled and the population of Madera increased by 50 percent. As of January 2005, the population growth of Chowchilla has slowed, while the population growth of Madera has continued at about the same rate since 1990.

The population growth rate in Madera County is greater than that of the State. The County is experiencing growth due to the number of San Francisco Bay Area residents moving into the area seeking less expensive housing options. There is nothing to suggest that the growth trend in Madera will not continue (Innovation Group, 2005).

HOUSING

As shown in **Table 3.7-2**, there are currently about 44,986 housing units in Madera County. Of these, 4,678 were estimated to be vacant in 2005. Regional vacancy rates ranged from 4.34 to 14.07 and averaged 10.40. As shown in **Table 3.7-3**, 2005 vacancy rates are generally high, when compared with historical rates since 1990. The Cities of Madera and Chowchilla generally have lower vacancy rates than the unincorporated portions of the County.

TABLE 3.7-2
2005 REGIONAL HOUSING ESTIMATES

Location	Total Housing Units*	Percent Vacant*	Vacant Units*
Madera County (total)	**44,986**	**10.40**	**4,678**
Chowchilla	3,021	5.49	165
Madera	14,314	4.34	621
Unincorporated County	27,651	14.07	3,890

NOTES: * Estimates. These figures do not include seasonal, recreational, or occasional use residences.
SOURCE: California Department of Finance, 2005.

TABLE 3.7-3
HISTORICAL VACANCY RATES

Location	Housing Vacancy Rate															
	1990	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Madera County	***7.98***	***7.98***	**7.99**	**8.01**	**8.01**	**8.01**	**8.00**	**7.99**	**7.99**	**7.99**	**10.48**	**10.47**	**10.46**	**10.43**	**10.43**	**10.40**
Chowchilla	4.01	*3.99*	4.01	4.02	*3.99*	4.00	4.02	4.02	4.01	4.02	5.50	5.50	5.51	5.50	5.50	5.49
Madera	*3.89*	*3.89*	*3.89*	3.90	*3.89*	*3.89*	3.90	3.90	3.90	3.90	4.34	4.34	4.34	4.33	4.34	4.34
Unincorp. County	10.51	*10.50*	*10.50*	*10.50*	10.51	10.51	10.51	10.51	10.51	10.51	14.07	14.07	14.07	14.07	14.07	14.07

NOTES: All rates are based on California Department of Finance estimates except for 1990 and 2000, which are based on U.S. Census counts. These figures do not include seasonal, recreational, or occasional use residences. Historically low rates during the shown time period are italicized.
SOURCE: California Department of Finance, 2005.

EMPLOYMENT AND INCOME

Employment

Madera County had approximately 62,200 people in its 2004 labor force, which is approximately 46 percent of the total population. Approximately 9 percent of the labor force was unemployed in 2004. The 2004 unemployment rate was substantially lower than the 2003 rate of 12.3 percent.

Between 2003 and 2004, the labor force also grew by more than 5,000 persons. The increased number in the workforce combined with a lower unemployment rate indicates that 2004 was a good year in terms of employment in Madera County.

Influenced by the main industry in the County, agriculture, the unemployment rate is extremely dynamic over the course of the year. For example, in September 2004, the unemployment rate was only 6.5 percent, but earlier in the year unemployment was as high as 11.8 percent.

Income

Census 2000 data represents the most current household income data available by census tract. Although this data is more than four years old, the use of older income date is expected to result in a conservative estimate of income when compared to 2004 poverty income levels, given that income levels tend to rise over the years due to inflation.

The average annual household income in Madera County, at $52,131, is much lower than the averages of California and the United States. The City of Madera has an even lower average income than the County at $43,942. There are two main reasons for a lower average income level in the region, a high unemployment rate and the seasonal nature of the agricultural industry. Median household income for census tracts in the vicinity of the Madera and North Fork sites is contained in **Tables 3.7-4** and **3.7-5**.

TABLE 3.7-4
HOUSEHOLD INCOME DATA BY CENSUS TRACT – MADERA SITE AND VICINITY

	Households: Median household income in 1999 (dollars)	Occupied housing units: Average household size; Total	2004 Poverty Level (dollars) *
Census Tract 2	33,289	3.34	19,803
Census Tract 5.03	43,822	2.99	15,219
Census Tract 5.06	41,806	3.67	19,803

NOTES: * Assumes average household size, conservatively rounded up to the nearest person and with a conservative assumption with regards to the number of children under 18 years.
SOURCE: U.S. Census Bureau, 2000, 2004; AES, 2005.

TABLE 3.7-5
HOUSEHOLD INCOME DATA BY CENSUS TRACT – NORTH FORK SITE AND VICINITY

	Households: Median household income in 1999 (dollars)	Occupied housing units: Average household size; Total	Poverty Level (dollars) *
Census Tract 1.02	35,858	2.43	15,219

NOTES: * Assumes average household size, conservatively rounded up to the nearest person and with a conservative assumption with regards to the number of children under 18 years.
SOURCE: U.S. Census Bureau, 2000, 2004; AES, 2005.

3.7.2 SOCIOECONOMIC CHARACTERISTICS OF THE TRIBE

The North Fork Rancheria of Mono Indians is comprised of 1,356 individuals. Of these 1,356 individuals, approximately 325 currently reside in Madera County, with 220 living in the Community of North Fork, 63 in the City of Madera, and the remainder in the City of Chowchilla and unincorporated areas. Approximately 412 members reside within Fresno County, 276 of which live in the City of Fresno. The remaining Tribal members live out of the area. The Tribe has grown rapidly over the past few years, primarily due to new enrollment.

In general, the economy of the Tribe lags behind the economy of the local community. According to a 2001 BIA Indian Population and Labor Force Report, the Tribal unemployment rate was approximately 13 percent, which is greater than the unemployment rate for Madera County. In addition, approximately 20 percent of employed Tribal members have incomes below the poverty level.

3.7.3 TRIBAL ATTITUDES, EXPECTATIONS, LIFESTYLE AND CULTURE

Both the Tribal government and individual Tribal members participate in area political and social activities. Tribal children attend local area schools and adult Tribal members are employed by local businesses. Altogether, Tribal attitudes and expectations favor increasing participation in, and benefit from, the regional economy, with continuation of the long tradition of comfortable coexistence and cooperation with their non-Indian neighbors.

3.7.4 ENVIRONMENTAL JUSTICE

POLICY/REGULATORY CONSIDERATIONS

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 NEPA. The CEQ, in consultation with the 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 the U.S. Environmental Protection Agency (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 the proposed action, and if so whether there may be disproportionately high and adverse environmental effects. 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); or
- 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 the 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 USEPA 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); or
- Other indications are present that indicate a low-income community is present within the census tract (secondary method of analysis).

In most cases, the primary method of analysis will suffice to determine whether a low-income community exists in the affected environment. However, when a census tract income may be just over the poverty line or where a low-income pocket within the tract appears likely, the secondary method of analysis may be warranted. Other indications of a low-income community under the

secondary method of analysis include limited access to health care, overburdened or aged infrastructure, and dependence on subsistence living.

For the Madera site, the following census tracts were analyzed for characteristics relevant to an environmental justice analysis:

- The census tract that includes the Madera site (tract 5.03), and
- Tracts adjacent to tract 5.03 (except to the west and south, where tract 5.03 extends over five miles from the Madera site).

Figure 3.7-1 displays the census tracts in the vicinity of the Madera site.

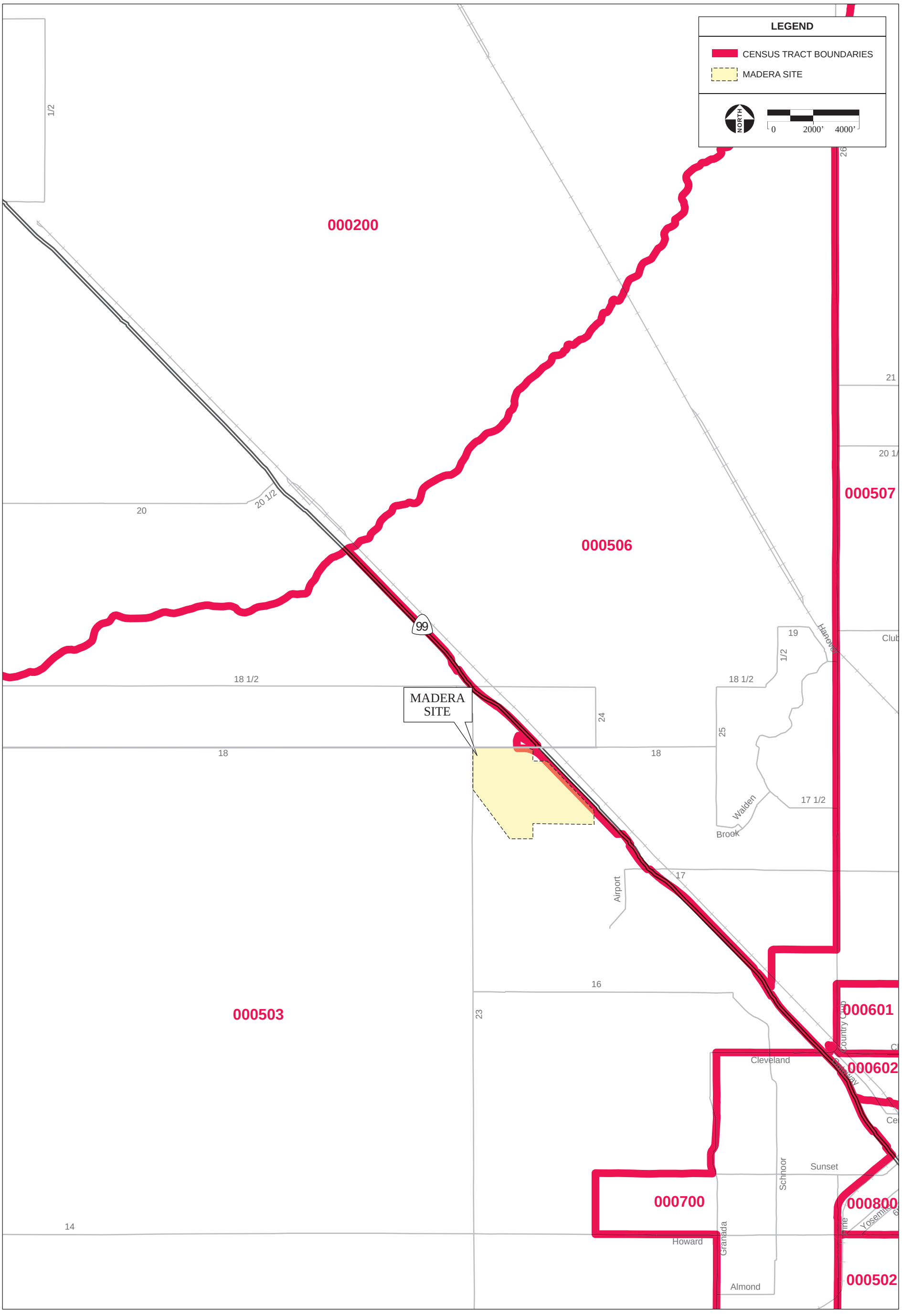
For the North Fork site, the census tract that includes the North Fork site (tract 1.02) was analyzed for characteristics relevant to an environmental justice analysis. No other census tracts were analyzed given the expansive nature of tract 1.02, which extends at least four miles from the North Fork site in all directions, to the Fresno County border to the east and south, and includes most of the nearby community of North Fork. **Figure 3.7-2** displays the census tracts in the vicinity of the North Fork site.

RACE

According to the 2000 Census (U.S. Census Bureau, 2005), the Madera County region has a predominately Caucasian ethnic composition. However a significant Latino population also exists in the region, with correspondingly smaller numbers of Blacks, Native Americans, Asians, and Pacific islanders. The following races are considered minorities under the executive order:

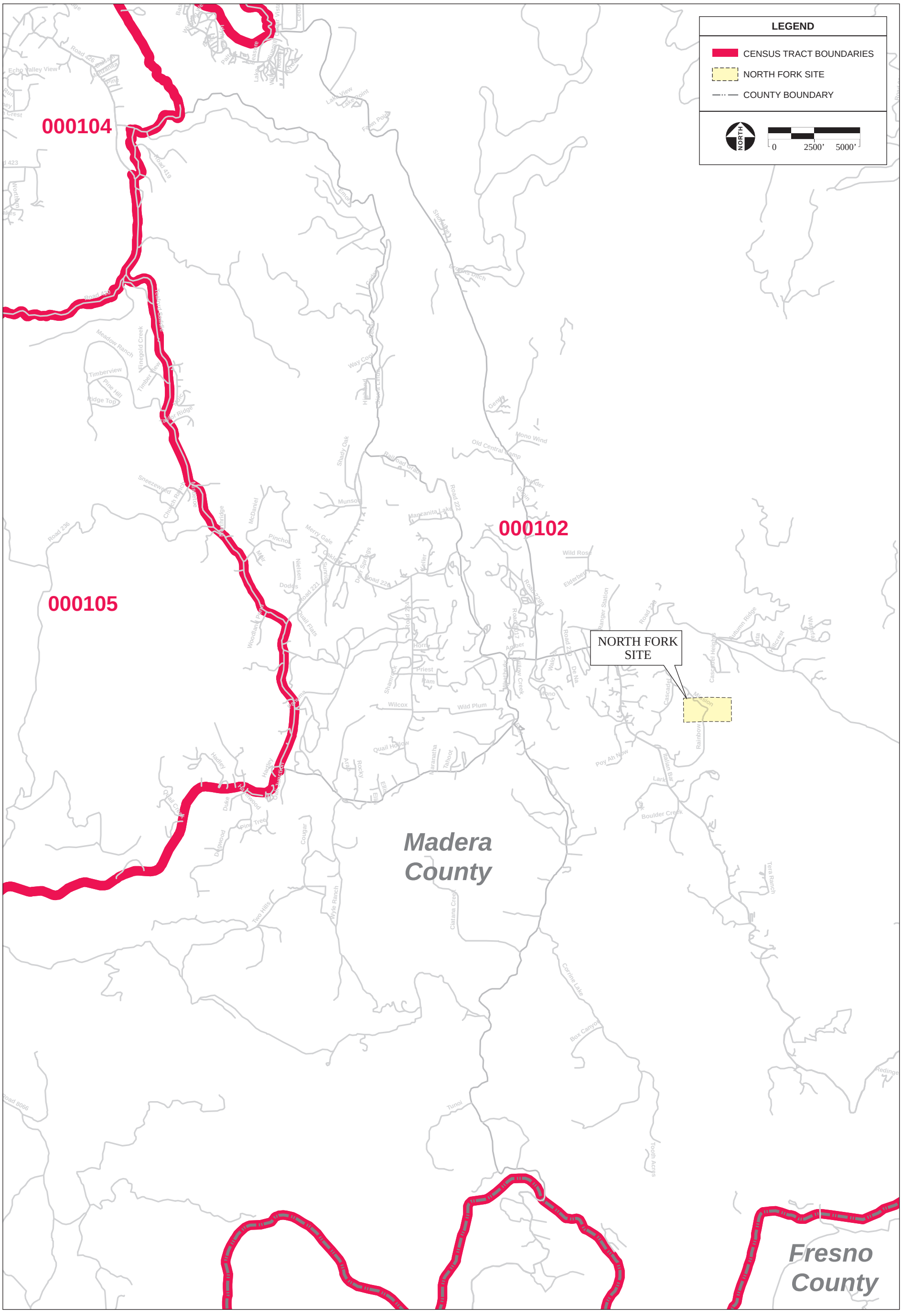
- American Indian or Alaskan Native,
- Asian or Pacific Islander,
- Black, not of Hispanic origin, and
- Hispanic.

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



SOURCE: U.S. DEPARTMENT OF COMMERCE Economics and Statistics Administration U.S. Census Bureau, 2000; AES, 2006

Figure 3.7-1
Census Tract Map – Madera Site



SOURCE: U.S. DEPARTMENT OF COMMERCE Economics and Statistics Administration U.S. Census Bureau, 2000; AES, 2006

Figure 3.7-2
Census Tract Map – North Fork Site and Vicinity

Census 2000 data represent the most current racial data available by census tract. Although this data is more than four years old, the racial composition of census tracts is not expected to have changed substantially. Conservative assumptions will apply to any borderline situations where a minor change in racial composition could affect the minority status of a census tract. **Tables 3.7-6** and **3.7-7** display the population of each minority race according to census tract for the vicinity of the Madera site and North Fork sites.

As shown in **Table 3.7-6**, all census tracts in the vicinity of the Madera site are either above or just below the 50 percent minority threshold. The tract with the lowest percentage, at 49 percent, is census tract 5.03, which includes the Madera site. Given that the demographic statistics are over four years old and could have changed, resulting in an increased percentage of minorities, this tract will be considered a minority community for the purposes of environmental justice analysis. Thus, the three census tracts in the vicinity of the Madera site are all considered minority communities.

TABLE 3.7-6
MINORITY POPULATION BY CENSUS TRACT – MADERA SITE AND VICINITY

	Total 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*
Census Tract 2	11,334	3,819	2,236	214	174	34	19	501	6,997	62
Census Tract 5.03	5,215	2,022	160	24	206	2	4	123	2,541	49
Census Tract 5.06	5,485	2,959	146	52	76	2	15	112	3,362	61

NOTES: * Rounded to the nearest one percent.
SOURCE: U.S. Census Bureau, 2000; AES, 2005.

As shown in **Table 3.7-7**, the census tract that contains the North Fork site and includes areas in the vicinity of the North Fork site is well below the 50 percent minority threshold. Thus, there are no minority communities present in the vicinity of the North Fork site.

TABLE 3.7-7
MINORITY POPULATION BY CENSUS TRACT – NORTH FORK SITE AND VICINITY

	Total 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	Total population: Not Hispanic or Latino; population of two or more races	Total population: minority	Percent minority*
Census Tract 1.02	4,278	358	13	284	21	15	34	274	999	23

NOTES: * Rounded to the nearest one percent.
SOURCE: U.S. Census Bureau, 2000; AES, 2005.

Tribal Gaming

A number of local tribes have been able to improve the socioeconomic conditions of their members through gaming. Specifically, the current primary gaming market in the area around Madera is comprised of three large casinos: Table Mountain, the closest facility to Fresno, the Chukchansi Gold Resort and Casino in Coarsegold, a resort that opened June 25, 2003, and The Palace, located south of Fresno in Lemoore. In addition to this primary gaming market, a number of other tribal casinos compete to varying degrees with the Madera area casinos. For most of the casinos in the primary market, proximity and ease of access from Fresno are major determinants of the casino popularity and revenue potential. Most of the mature, larger properties in the market either have, or will soon have, ample attractive non-gaming amenities to attract gamers from longer distances as well. The existing and proposed tribal casinos that make up the competitive gaming market in the Madera area are described in more detail below.

Table Mountain Casino

Table Mountain Casino is located just east of Millerton Lake, approximately 12 miles east of Route 41 in the town of Friant. The facility is easily visible from the road with parking available in a lot in front of the casino and a parking structure in the rear.

Chukchansi Gold

Located in Coarsegold, Chukchansi Gold opened June 25, 2003. The new facility's design offers a large, open gaming floor that is well laid out with easy access to restaurants and the hotel. The property is situated in the foothills adjacent to Yosemite National Park and offers beautiful views.

Palace Casino

Forty-five minutes to the south of Fresno, near the town of Lemoore, is the Palace Gaming Center Casino. Once a truck stop, the facility now has 2,000 slot machines, 30 gaming tables, a large bingo hall, and a variety of food and beverage outlets including a steak house and large buffet.

Mono Wind Casino

The Big Sandy Rancheria tribe currently operates the Mono Wind Casino in Auberry. Although geographically close to Table Mountain (approximately 10 miles to the east), Mono Wind Casino is located in a mountainous area that is difficult to reach.

Eagle Mountain Casino

Southeast of Lemoore, approximately 100 miles from the Madera site, is the Eagle Mountain gaming facility, run by the Tule River Tribe.

Black Oak Casino

In Tuolumne, approximately 75 miles north of Madera, the Tuolumne Band of Me-Wuk Indians offers the Black Oak Casino. There are 600 slot machines and 10 gaming tables at this casino, as well as a cafe and bar.

Chicken Ranch and Bingo Casino

The Chicken Ranch Bingo is a non-compacted casino in Jamestown which offers a 900-seat bingo hall and a comparatively limited offering of slot games, totaling approximately 250.

Jackson Rancheria

North of the immediate region, and located approximately 100 miles north of Madera, Jackson Rancheria caters to gamers 18 and over and does not serve alcohol. An arcade is available for minors. The primary market for the property is the Stockton-Sacramento corridor

Proposed Casinos

In addition to the existing competition in the market, there is one other proposed casino in the Fresno-Madera-Yosemite area market that will compete for gamers in the region, as well as several large-scale casinos, existing and proposed, well outside of the region near major metropolitan areas in Northern California. The most proximate proposed casino to Madera is to be located approximately one mile from Table Mountain. The Big Sandy Band of Western Mono Indians in conjunction with Harrah's/Caesars Entertainment is planning a $200 million casino and hotel on more than 215 acres near the intersection of Millerton Road and Auberry Road. Three other casinos have been assumed in the outlying markets: Shingle Springs, Lytton San Pablo, and Graton Rancheria in Rohnert Park.

INCOME

Section 3.7.1 discusses the median household income in census tracts in the vicinity of the Madera and North Fork sites. As shown in **Tables 3.7-4** and **3.7-5**, median household income in

census tracts in the vicinity of the Madera and North Fork sites is, in all cases, well above the poverty level. Thus, no low-income communities are present in the vicinity of either site.

3.8 RESOURCE USE PATTERNS

3.8.1 TRANSPORTATION

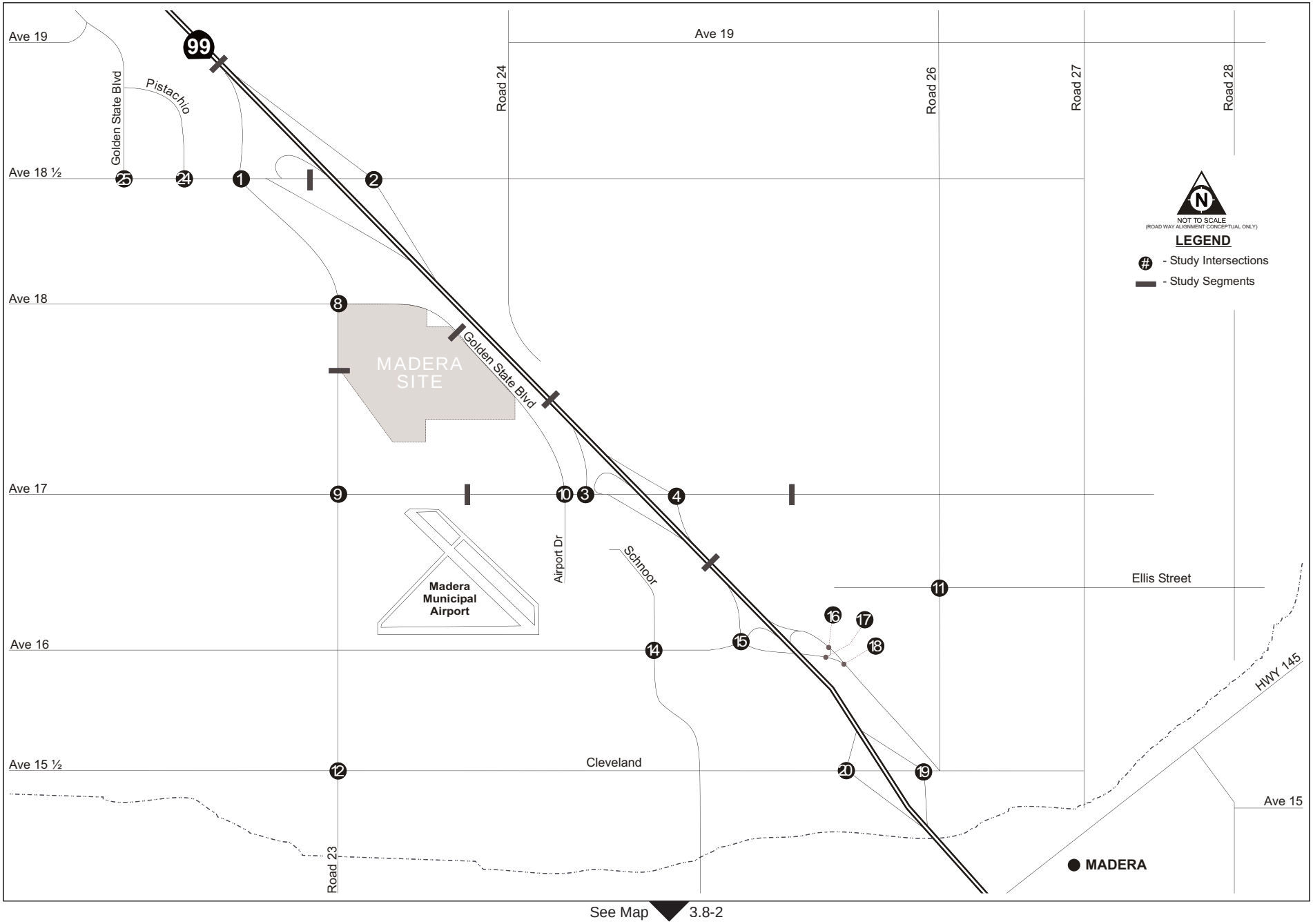
MADERA SITE

Transportation/Circulation

Existing Circulation Network

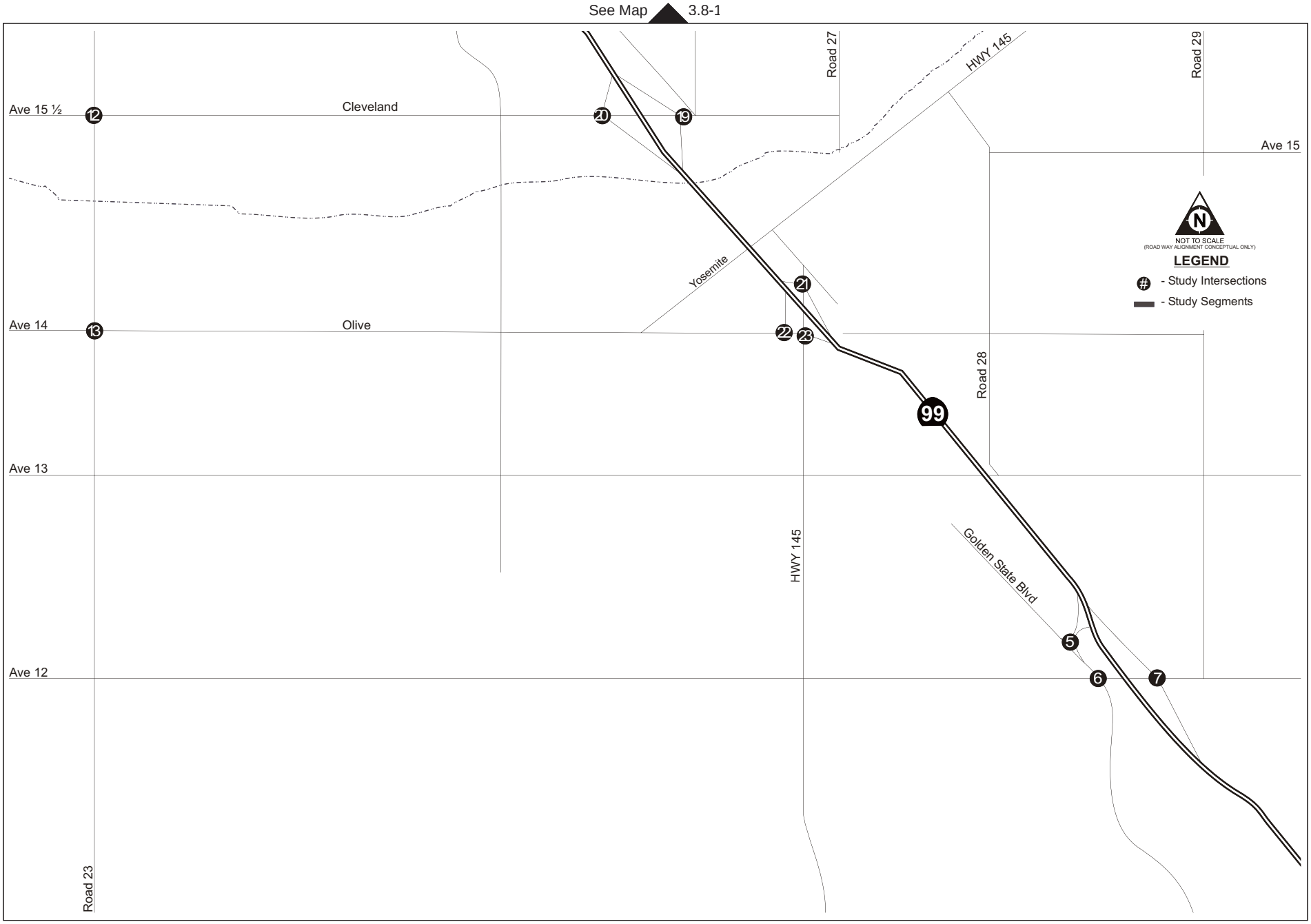
The main transportation route through the Madera County is State Route 99 (SR-99), a north-south route connecting the Kern, Tulare, and Fresno Counties to the south with Madera, Mariposa, San Joaquin, and Sacramento Counties to the north. The Madera site is bounded on the north by Avenue 18, rural residential land, light industrial land, and vacant land; on the east by Golden State Boulevard and State Route 99 (SR-99); on the south by agricultural land and residential land; and on the west by Road 23 and agricultural land. Regional access to the Madera site is via SR-99. Road 23, Avenue 18, and Golden State Boulevard would provide direct access to the proposed casino and hotel resort. **Figures 3.8-1** and **3.8-2** show the major roadways in the vicinity of the Madera site. A traffic study was prepared for the project and is included in **Appendix M**. This section discusses the existing traffic conditions in the vicinity of the Madera site. The following is a description of the major roadways in the vicinity of the Madera site:

- Avenue 18 ½ is a two-lane county roadway with a posted speed limit of 35 miles per hour (mph).
- Avenue 18 a two-lane arterial roadway with no posted speed limit.
- Avenue 17 is a two-lane arterial roadway with a posted speed limit of 45 mph.
- Avenue 16 is a two-lane arterial roadway with a posted speed limit varying from 35 to 40 mph.
- Avenue 15½ is a two-lane arterial roadway with no posted speed limit.
- Avenue 14 is a two-lane arterial roadway with no posted speed limit.
- Avenue 12 is a two-lane arterial roadway with a posted speed limit of 35 mph.
- Road 23 is a two-lane county road with a posted speed limit of 45 mph.
- Road 26 is a four-lane county roadway with no posted speed limit.
- Golden State Boulevard/Airport Road is a two-lane arterial roadway with a posted speed limit of 35 mph.
- Golden State Boulevard is a two-lane arterial roadway with no posted speed limit.
- Schnoor Avenue is a two-lane arterial roadway with a posted speed limit of 40 mph.
- Cleveland Avenue is a four-lane roadway with a posted speed limit of 35 mph.
- Olive Avenue is an arterial varying from two to three lanes with a posted speed of 30 mph.
- Ellis Street is a two-lane arterial roadway with no posted speed limit.
- State Route 99 (SR-99) is a four-lane freeway with a posted speed limit of 65 mph.
- State Route 145 (SR-145) is a two-lane highway with a posted speed limit of 35 mph.



SOURCE: TPG Consulting, Inc., 2005; AES, 2005

Figure 3.8-1
Madera Site – Major Roadways and Study Intersections



SOURCE: TPG Consulting, Inc., 2005; AES, 2005

Figure 3.8-2
Madera Site – Major Roadways and Study Intersections

Transit, Bicycle and Pedestrian Facilities

Transit. Madera Dial-A-Ride service is offered in the City of Madera and its surrounding area. Dial-A-Ride is a demand-response service offered by the City of Madera with cooperative funding by Madera County. Service area is within approximately five miles of Downtown Madera. Hours of operation are 7:00 a.m. to 6:30 p.m. Monday through Friday, 9:00 a.m. to 4:00 p.m. Saturday, and 8:30 a.m. to 2:30 p.m. Sunday. Reservations are required. Fares are $1.00 for rides beginning or ending within the City limits (Ellis to the north, Avenue 13 to the south, Road 24½ to the west and Road 29 to the east) and $2.00 for rides beginning or ending outside of the City limits but within the area bounded by Avenue 19 to the north, Avenue 12 to the south, Road 23 to the west and Road 29½ and Road 30½ to the east.

Greyhound offers inter-community bus service several times a day with stops in both the City of Madera and Chowchilla. Buses operate seven days a week from the City of Madera's Downtown Intermodal Center.

Madera County also has one private taxi operator that provides service seven days per week, 24 hours per day.

Bicycle. There are currently no bike paths, lanes, or routes located in the study area surrounding the Madera site. According to the Madera County 2004 *Regional Bicycle Transportation Plan*, bike facilities are planned for the study area surrounding the Madera site. Construction is expected to be completed within 10 years.

Pedestrian. There are no pedestrian sidewalks, walking trails, or other areas separated from the roadways in the immediate vicinity of the Madera site.

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. Level of Service is represented as letters ranging from LOS A to LOS F, whereby LOS A represents the best traffic flow driving conditions and LOS F represents the worst traffic flow driving conditions.
Signalized and unsignalized intersections operating conditions are quantified based on average control delay per vehicle per second, while roadway segments use volume-to-capacity ratios and freeway segments use density (passenger cars/mile/lane).

Control delay includes initial acceleration delay, queue move-up time, stopped delay, and final acceleration delay. For signalized intersections, "the average control delay per vehicle is estimated for each lane group and aggregated for each approach and for the intersections as a whole" (TRB, 2000). The levels of service shown for signalized intersections are representative of the overall

level of service for that intersection. For unsignalized two-way stop controlled intersections, the level of service presented is the level of service for the worst operating movement, or minor road, at that intersection as opposed to the overall intersection level of service.

Street segment assessments for Madera County roadways were completed using the Capacity Table developed by Korve Engineering for use with the MCTC model. Levels of service for the segment volume-to-capacity ratios developed in this study were derived from the level of service ranges used in the model.

Table 3.8-1 relates the operational characteristics associated with each level of service category for both signalized and unsignalized intersections.

The freeway segment analysis used a free-flow speed of 70 mph. A freeway truck percentage of 24 percent was used and a recreational vehicle (RV) percentage of 2 percent was used for the freeway calculations. **Table 3.8-2** relates the operational characteristics associated with each level of service category for freeway segments.

LOS Thresholds

The California Department of Transportation (Caltrans) considers LOS C transitioning to D on State highways to be the acceptable measure, meaning worsening of roadway conditions to LOS D, E or F are unacceptable. Caltrans realizes this LOS may not always be feasible and recommends the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway is operating below the LOS threshold, the existing measures of effectiveness should be maintained.

The County and City of Madera have adopted LOS D as the acceptable LOS measure, meaning a worsening of traffic conditions to LOS E or F is unacceptable. Each table presenting LOS results at the study roadway segments and intersections under existing conditions are shown with the corresponding LOS threshold for reference.

Study Freeway and Roadway Segments and Intersections

Selection of study segments and intersections was based on the Madera County Regional Transportation model (model) and input from Madera County staff. Intersections where trip assignment would reasonably be expected to result in a capacity reduction of less than 1 percent were removed from the study, based on input from Madera County staff. Based on these parameters, the following six freeway segments and five roadway segments were analyzed:

TABLE 3.8-1
INTERSECTION LEVEL OF SERVICE DESCRIPTION

Level of Service	Conditions	Signalized Intersection Description	Signalized Delay (secs/veh)[1]	Unsignalized[2] Delay (secs/veh)
A	Free Flow	Users experience very low delay. Progression is favorable and most vehicles do not stop at all.	< 10.0	< 10.0
B	Stable Operations	Vehicles travel with good progression. Some vehicles stop, causing slight delay.	> 10.0 to 20.0	> 10.0 to 15.0
C	Stable Operations	Higher delays result from fair progression. A significant number of vehicles stop, although many continue to pass through the intersection without stopping.	> 20.0 to 35.0	> 15.0 to 25.0
D	Approaching Unstable	Congestion is noticeable. Progression is unfavorable, with more vehicles stopping rather than passing through the intersection.	> 35.0 to 55.0	> 25.0 to 35.0
E	Unstable Operations	Traffic volumes are at capacity. Users experience poor progression and long delays.	> 55.0 to 80.0	> 35.0 to 50.0
F	Forced Flow	Intersection's capacity is oversaturated, causing poor progression and unusually long delays.	> 80.0	> 50.0

NOTES: [1] seconds/vehicle
[2] Unsignalized intersections include all-way stop and two-way stop controlled intersection.
SOURCE: TPG Consulting, Inc. 2006; AES 2006.

Freeway Segments

1. SR-99 NB – North of Avenue 18½
2. SR-99 SB – North of Avenue 18½
3. SR-99 NB – Avenue 18½ to Avenue 17
4. SR-99 SB – Avenue 18½ to Avenue 17
5. SR-99 NB – South of Avenue 17
6. SR-99 SB – South of Avenue 17

Roadway Segments

1. Avenue 18½ - Road 24 to Road 23
2. Road 23 – Avenue 18½ to Avenue 17
3. Avenue 17 – Road 23 to SR-99
4. Avenue 17 – SR-99 to Road 27
5. Golden State Boulevard – Avenue 17 to Road 23

TABLE 3.8-2
FREEWAY LEVEL OF SERVICE DESCRIPTION

Level of Service	Conditions[1]	Description	Density (pc/mi/ln)[2]
A	Free Flow	Free-flow speeds prevail. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream. Effects of incidents or point breakdowns are easily absorbed at this level.	≤ 11
B	Stable Operation	Free-flow speeds are maintained. The ability to maneuver within the traffic stream is slightly restricted. Effects of minor incidents or point breakdowns are still easily absorbed at this level.	> 11 to 18
C	Stable Operation	Freedom to maneuver within the traffic stream is noticeably restricted, and lane changes require more care and vigilance on the part of the driver. Minor incidents may still be absorbed, but the local deterioration in service will be substantial. Queues may be expected to form behind any significant blockage.	> 18 to 26
D	Approaching Unstable	Speeds begin to decline slightly with increasing flows and density begins to increase somewhat more quickly. Freedom to maneuver within the traffic stream is more noticeably limited. Even minor incidents can be expected to create queuing, because the traffic stream has little space to absorb disruptions.	> 26 to 35
E	Unstable Operations	Traffic volumes are at capacity. Any disruption to the traffic stream can establish a disruption wave that propagates throughout the upstream traffic flow. Any incident can be expected to produce extensive queuing.	> 35 to 45
F	Forced Flow	Traffic volumes exceed the capacity of the freeway and traffic queues develop easily. Stop and go traffic conditions exist.	> 45

NOTES: [1] free flow conditions at 65 or 70 mph
[2] passenger car/mile /lane
SOURCE: TRB, 2000; TPG Consulting, Inc. 2006; AES, 2006.

As discussed above, in cases where trips assigned to intersections would reasonably be expected to result in a capacity reduction of less than 1 percent, intersections were removed from further analysis. Based on these parameters and upon discussion with Caltrans, Madera County, and the Cities of Madera and Chowchilla, the following thirty intersections were analyzed:

1. Avenue 18½ at SR-99 SB ramps/Road 23
2. Avenue 18½ at SR-99 NB ramps
3. Avenue 17 at SR-99 SB ramps
4. Avenue 17 at SR-99 NB ramps
5. Avenue 12/Golden State Boulevard at SR-99 SB ramps
6. Avenue 12 at Golden State Boulevard
7. Avenue 12 at SR-99 NB ramps

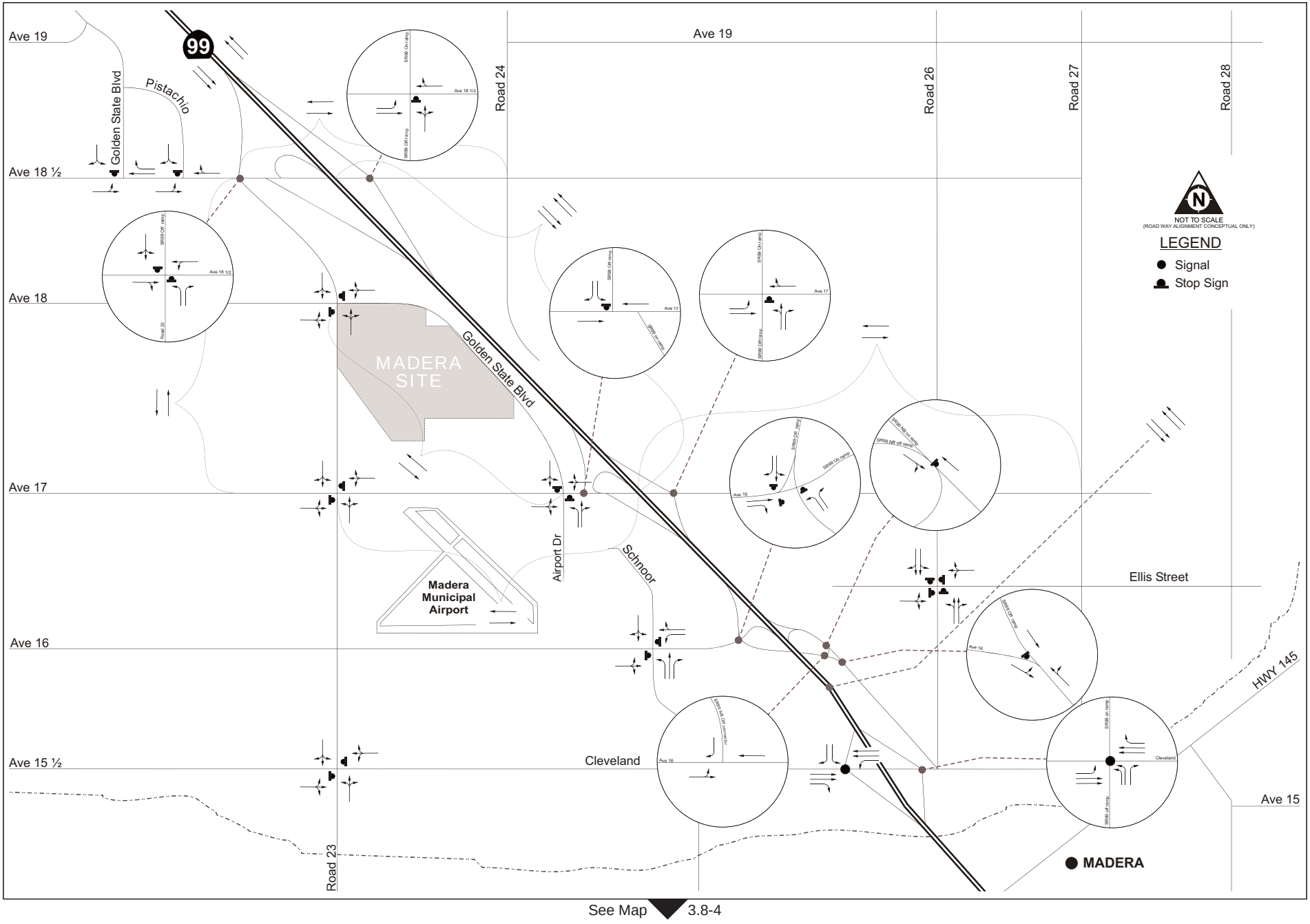
8. Avenue 18 at Road 23
9. Avenue 17 at Road 23
10. Avenue 17 at Golden State Boulevard
11. Ellis Street at Road 26
12. Avenue 15½ at Road 23
13. Avenue 14 at Road 23
14. Avenue 16 at Schnoor Avenue
15. Avenue 16 at SR-99 SB ramps
16. Avenue 16 at SR-99 NB ramps
17. Avenue 16/Avenue 16 connector at SR-99 NB ramps
18. Avenue 16 at SR-99 NB ramp connector
19. Gateway/Avenue 16 at SR-99 NB ramps
20. Avenue 16/Ellis Street at Golden State Boulevard
21. Avenue 16/Ellis Street at SR-99 SB ramps
22. Avenue 16/Ellis Street at SR-99 NB ramps
23. Cleveland Avenue/Avenue 15½ at SR-99 NB ramps
24. Cleveland Avenue/Avenue 15½ at SR-99 SB ramps
25. SR 145/Madera Avenue at SR-99 NB ramps
26. Olive Avenue/Avenue 14 at SR-99 SB off-ramp
27. Olive Avenue/Avenue 14/SR-99 SB on-ramp at SR 145
28. Avenue 18½ at Pistachio Drive
29. Avenue 18½ at Golden State Boulevard
30. Avenue 18½ at Golden State Boulevard/Road 23

Figures 3.8-1 and **3.8-2** present the location of the study intersections for the Madera site and **Figures 3.8-3** and **3.8-4** present the existing lane configuration and traffic controls for the Madera site study intersections.

Data Collection

Traffic volumes were collected in accordance with Caltrans *Guide for the Preparation of Traffic Impact Studies* (Caltrans, 2001). **Table 3.8-3** details when traffic data was collected at each road segment. **Table 3.8-4** provides information on dates when traffic data was collected at each study intersection.

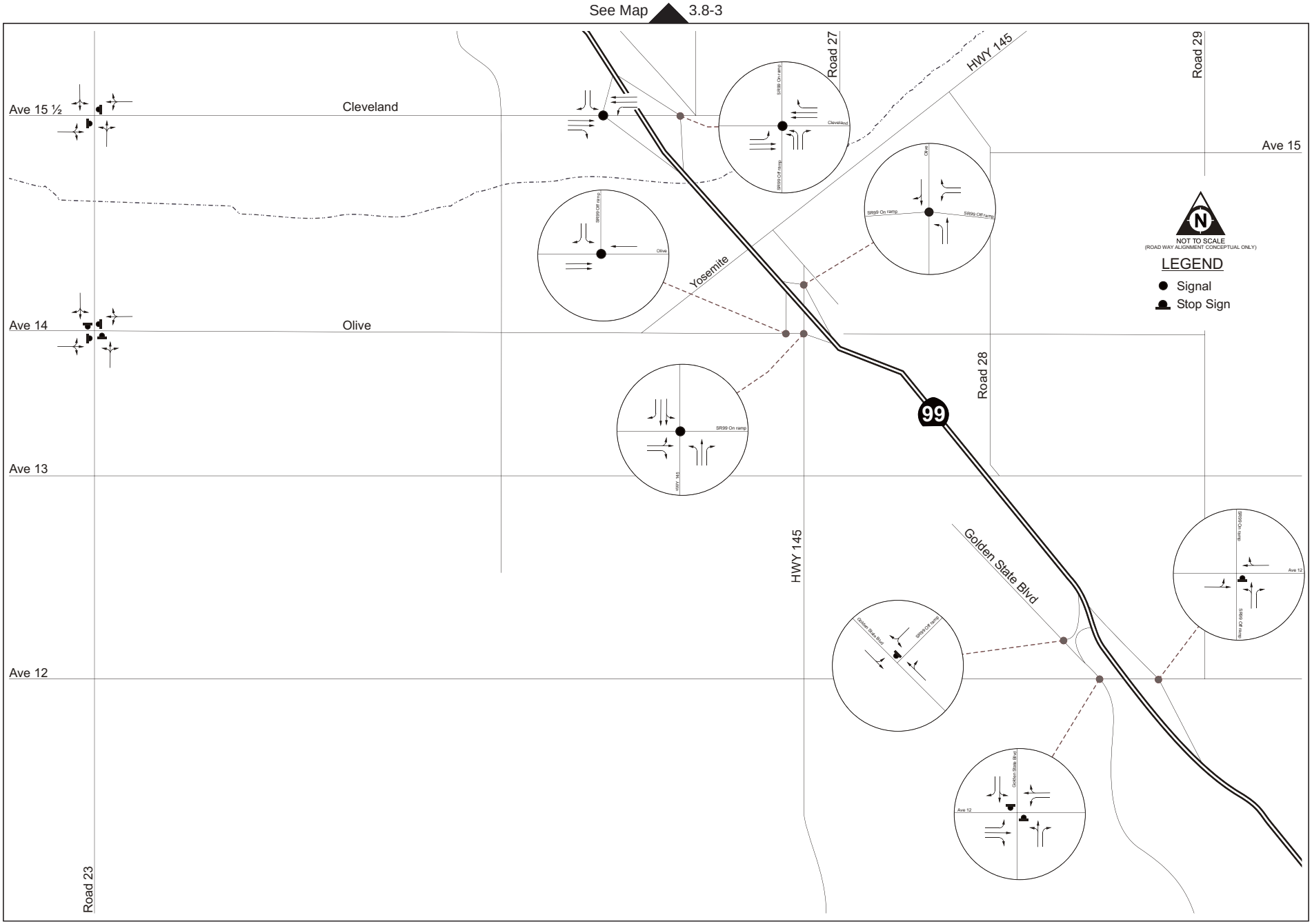
Traffic volumes were collected during the weekday a.m. and p.m. peak periods of the day in the middle of the week. The a.m. and p.m. peak periods were determined to be between the hours of 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m. Per discussions with Madera County, City of Madera, and Caltrans staff, the above peak of the street traffic times were analyzed. These peak periods are also the standard peak periods typically used for study in the County and City of Madera.



SOURCE: TPG Consulting, Inc., 2005; AES, 2005

Figure 3.8-3

Madera Site – Existing Lane Configuration and Intersection Control



SOURCE: TPG Consulting, Inc., 2005; AES, 2005

Figure 3.8-4

Madera Site – Existing Lane Configuration and Intersection Control

TABLE 3.8-3
SEGMENT DATA COLLECTION PERIOD (MADERA SITE)

Segments	Day	Date
Avenue 18½ – Road 24 to Road 23	Tuesday	11/30/04
Road 23 – Avenue 18½ to Avenue 17	Tuesday	3/2/04
Avenue 17 – Road 23 to SR-99	Tuesday	11/30/04
Avenue 17 – SR-99 to Road 27	Wednesday	7/28/04
Golden State Boulevard – Avenue 17 to Avenue 18	Tuesday	3/2/04

SOURCE: TPG Consulting, Inc. 2006; AES, 2006.

TABLE 3.8-4
INTERSECTION DATA COLLECTION PERIOD (MADERA SITE)

Intersections	AM Peak Hour		PM Peak Hour	
	Day	Date	Day	Date
Avenue 18½ at SR-99 SB ramps/Road 23	Wednesday	7/26/06	Wednesday	7/26/06
Avenue 18½ at SR-99 NB ramps	Wednesday	7/26/06	Wednesday	7/26/06
Avenue 17 at SR-99 SB ramps	Tuesday	3/2/04	Tuesday	3/2/04
Avenue 17 at SR-99 NB ramps	Tuesday	3/2/04	Tuesday	3/2/04
Avenue 12/Golden State Boulevard at SR-99 SB ramps	Thursday	12/2/04	Thursday	12/2/04
Avenue 12 at Golden State Boulevard / Road 29	Thursday	12/2/04	Thursday	12/2/04
Avenue 12 at SR-99 NB Ramps	Thursday	12/2/04	Thursday	12/2/04
Avenue 18 at Road 23	Tuesday	3/2/04	Tuesday	3/2/04
Avenue 17 at Road 23	Tuesday	3/2/04	Tuesday	3/2/04
Avenue 17 at Golden State Boulevard / Airport Road	Tuesday	3/2/04	Tuesday	3/2/04
Ellis Street at Road 26	Wednesday	12/1/04	Wednesday	12/1/04
Avenue 15½ at Road 23	Wednesday	12/1/04	Wednesday	12/1/04
Avenue 14 at Road 23	Wednesday	12/1/04	Wednesday	12/1/04
Avenue 16 at Schnoor Avenue/Golden State Boulevard	Tuesday	4/5/05	Tuesday	4/5/05
Avenue 16/Avenue 16 connector at SR-99 NB ramps	Tuesday	9/13/05	Wednesday	9/14/05
Avenue 16 at SR-99 NB ramps	Tuesday	9/13/05	Wednesday	9/14/05
Gateway/Avenue 16 at SR-99 NB ramps	Tuesday	9/13/05	Wednesday	9/14/05
Avenue 16 at SR-99 SB Ramps	Tuesday	9/13/05	Wednesday	9/14/05
SR-99 NB Ramps at Cleveland Avenue/Avenue 15½	Wednesday	12/1/04	Wednesday	12/1/04
SR-99 SB Ramps at Cleveland Avenue/Avenue 15½	Wednesday	12/1/04	Wednesday	12/1/04
SR-99 NB Ramps at SR145/Madera Avenue	Thursday	12/2/04	Thursday	12/2/04
Olive Avenue/Avenue 14 at SR-99 SB off-ramp	Thursday	12/2/04	Thursday	12/2/04
SR-99 SB On-Ramp/Olive Avenue/Avenue 14 at SR-145	Wednesday	12/1/04	Wednesday	12/1/04
Avenue 18½ at Pistachio Drive	Wednesday	7/26/06	Wednesday	7/26/06
Avenue 18½ at Golden State Boulevard	Wednesday	7/26/06	Wednesday	7/26/06

SOURCE: TPG Consulting, Inc. 2006; AES, 2006.

Madera County Traffic Model

The Madera County Transportation Commission (MCTC) is responsible for developing and maintaining a microcomputer-based traffic simulation model that represents Madera County. The current model was developed to analyze proposed land uses, circulation systems, and air quality and covers the entire Madera County area, as well as portions of Fresno, Merced, and Stanislaus Counties. Residential dwelling unit and employment adjustments were made to the 2025 Without-Project model land use data to incorporate twenty-one approved or proposed General Plan Amendments (GPAs) that were located in the County and City of Madera. **Section 4.8** provides additional details on the GPAs.

Intersection heavy vehicle percentages were developed from the existing conditions count data. A minimum default of 2 percent heavy vehicles was used on all intersections and in all scenarios. All signalized intersections within a one-half mile distance were analyzed as actuated coordinated. Actuated signals use vehicle detectors and an actuated controller unit to assign the right of way based on changing traffic demand. Coordination between the signals can either be based on pre-timed coordination or hardwire coordination. The signalized intersections were optimized to achieve the greatest reduction in overall intersection delay.

Left turns at signalized intersections were analyzed as "protected" in the study area. Protected lefts are left turns that are only allowed to go during their "protected" phase of the signal, and the left turns are not allowed to go at the same time as the opposing direction through and right-turn movements.

If an unsignalized intersection was projected to operate below the adopted level of service threshold or have movements or approaches that were projected to operate below the adopted level of service threshold, the existing lane configurations were tested to determine if the intersection could be mitigated.

Existing Freeway and Roadway Segment Performance

This condition is based on current traffic counts, existing roadway geometry, and existing development conditions. This condition serves as a baseline from which projections for the 2008 and 2030 years are derived it is reported without the project added into the condition.

Table 3.8-5 summarizes the results of this weekday freeway and roadway segment analysis for the existing level of service conditions. As shown in **Table 3.8-5** below, based on existing traffic volumes, the following freeway and roadway segments currently operate at an unacceptable LOS:

- SR-99 – North of Avenue 18½
- SR-99 SB – Avenue 18½ to Avenue 17
- SR-99 SB – South of Avenue 17

- Avenue 17 – SR-99 to Road 27

TABLE 3.8-5
EXISTING FREEWAY AND ROADWAY SEGMENT PERFORMANCE - MADERA SITE

Segment	LOS Threshold	Existing			
		LOS		Density (pc/mi/ln)[1]	
		AM	PM	AM	PM
Freeway Segment					
SR-99 NB – North of Avenue 18 ½	C	C	C	21.5	21.0
SR-99 SB – North of Avenue 18 ½	C	B	**D**	17.6	**26.5**
SR-99 NB – Avenue 18 ½ to Avenue 17	C	C	C	23.8	23.2
SR-99 SB – Avenue 18 ½ to Avenue 17	C	C	**D**	19.3	**30.1**
SR-99 NB – South of Avenue 17	C	C	C	22.9	22.3
SR-99 SB – South of Avenue 17	C	C	**D**	18.6	**28.5**
Roadway Segment					
Avenue 18½ – Road 24 to Road 23	D	B	B	NA	NA
Road 23 – Avenue 18½ to Avenue 17	D	B	B	NA	NA
Avenue 17 – Road 23 to SR-99	D	A	A	NA	NA
Avenue 17 – SR-99 to Road 27	D	**E**	C	NA	NA
Golden State Boulevard – Avenue 17 to Road 23	D	A	A	NA	NA

NOTES: **Bold** text denotes unacceptable LOS.
NA = not applicable
[1] density = passenger car per mile per lane
SOURCE: TPG Consulting, Inc. 2006; AES 2006.

Existing Intersection Performance

Table 3.8-6 summarizes the results of this weekday intersection analysis for the existing level of service conditions and shows the intersection delay experienced per vehicle. As shown below, based on existing level of service, the following intersections currently operate at an unacceptable LOS:

- Avenue 12/Golden State Boulevard at SR-99 SB ramps/WB Approach
- Avenue 12 at Golden State Boulevard/NB Approach
- Avenue 12 at Golden State Boulevard/SB Approach
- Avenue 12 at SR-99 NB ramps/NB Approach

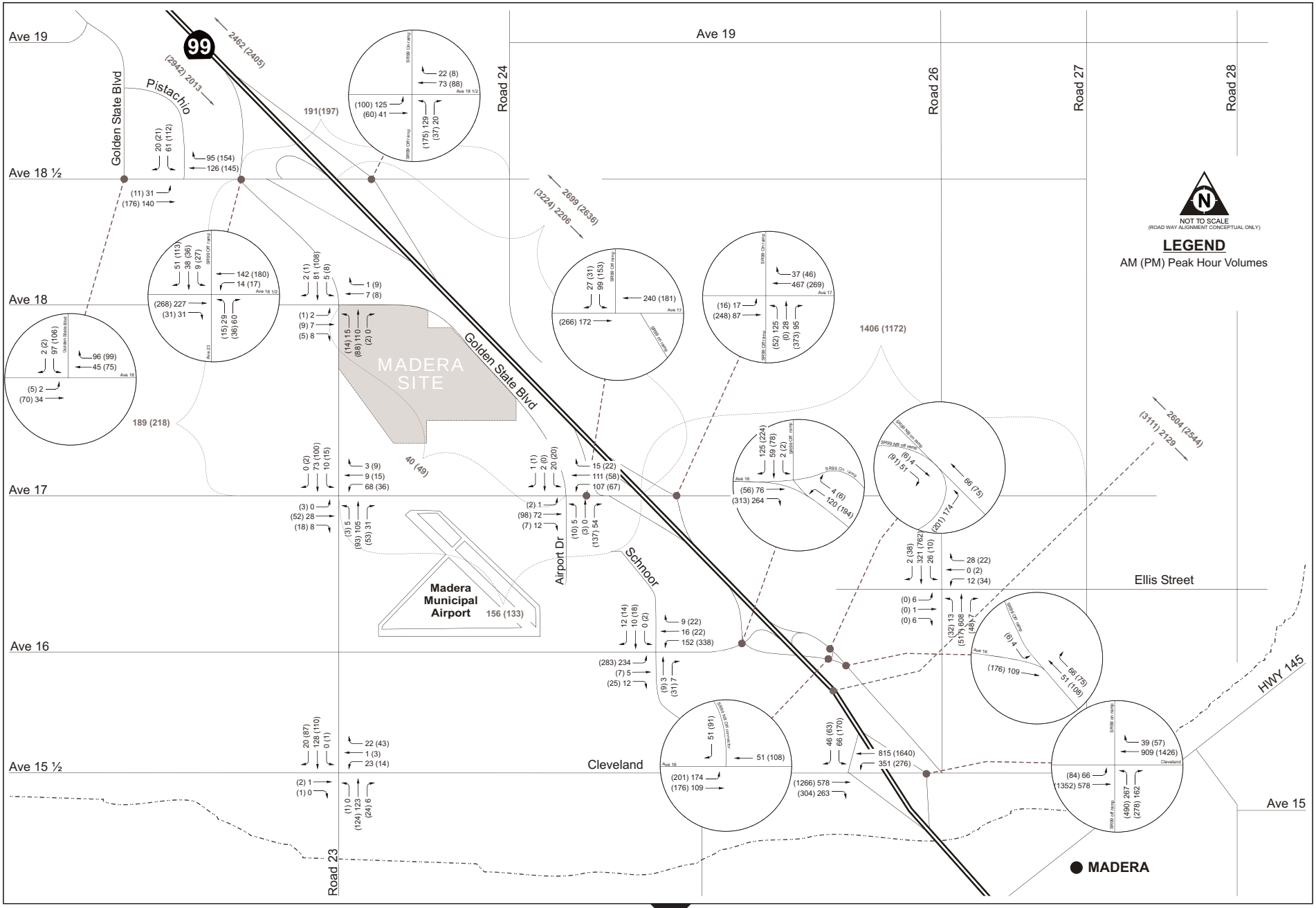
Figures 3.8-5 and **3.8-6** present the existing intersection volumes at each of the Madera site study intersections.

TABLE 3.8-6
EXISTING INTERSECTION PERFORMANCE - MADERA SITE

Intersection	LOS Thres-hold	2005 w/o Project			
		AM		PM	
		LOS	Delay (secs)[1]	LOS	Delay (secs)
Avenue 18½ at SR-99 SB ramps/Road 23					
• WB Left-Through	C	A	8.1	A	8.2
• NB Approach		B	12.1	B	13.2
• SB Approach		B	13.0	C	15.7
Avenue 18½ at SR-99 NB ramps					
• EB Left	C	A	8.3	A	7.8
• NB Approach		C	15.8	C	15.8
Avenue 17 at SR-99 SB ramps	C				
• SB Approach		B	12.5	B	14.5
Avenue 17 at SR-99 NB ramps					
• EB Left	C	A	8.7	A	8.0
• NB Approach		C	16.5	C	15.5
Avenue 12/Golden State Boulevard at SR-99 SB ramps	C				
• SB Left-Though		A	8.3	A	8.7
• **WB Approach**		B	11.3	**E**	**44.9**
Avenue 12 at Golden State Boulevard					
• EB Left	D	A	8.5	A	8.7
• WB Left		A	8.1	A	8.6
• **NB Approach**		C	20.9	**F**	**279.6**
• **SB Approach**		D	31.9	**F**	**111.1**
Avenue 12 at SR-99 NB ramps					
• EB Left-Though	C	A	8.9	A	8.9
• **NB Approach**		**E**	**46.9**	**F**	**95.1**
Avenue 18 at Road 23					
• NB Left-Through-Right	D	A	7.5	A	7.6
• SB Left-Through-Right		A	7.6	A	7.6
• WB Approach		B	10.5	A	9.8
• EB Approach		A	9.8	B	10.2
Avenue 17 at Road 23					
• NB Left-Through-Right	D	A	7.4	A	7.4
• SB Left-Through-Right		A	7.5	A	7.6
• WB Approach		B	11.2	B	11.5
• EB Approach		B	10.5	B	11.2
Avenue 17 at Golden State Boulevard	D				
• EB Left-Through-Right		A	7.5	A	7.4

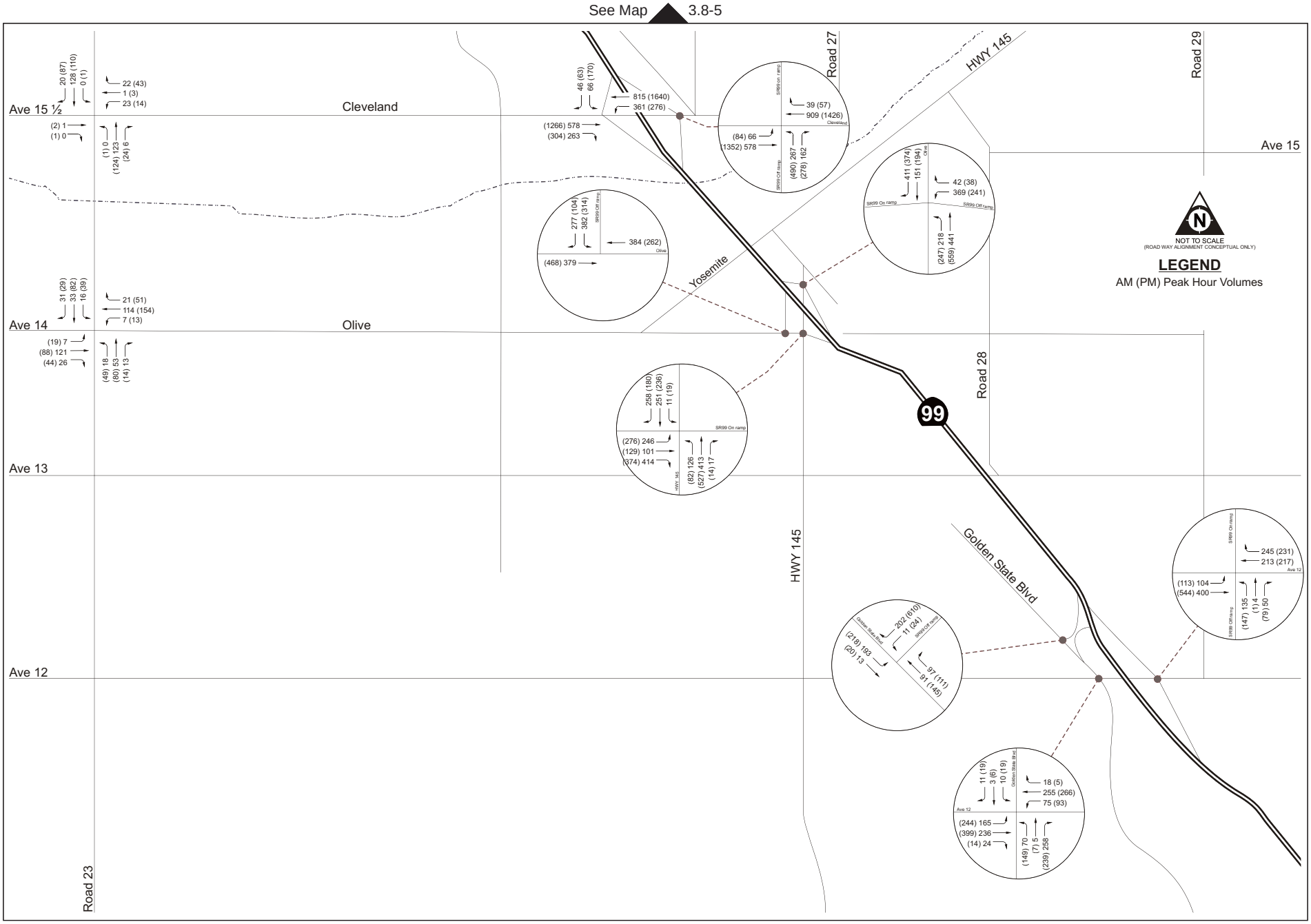
• WB Left-Through-Right		A	7.6	A	7.6
• NB Approach		A	9.5	A	9.7
• SB Approach		B	13.5	B	13.3
Ellis Street at Road 26	D	B	11.51	C	16.47
Avenue 15½ at Road 23					
• NB Left-Through-Right		A	7.6	A	7.8
• SB Left-Through-Right	D	A	7.6	A	7.6
• WB Approach		B	10.3	B	9.9
• EB Approach		A	10.2	C	11.8
Avenue 14 at Road 23	D	A	8.72	C	10.03
Avenue 16 at Schnoor Avenue					
• NB Left		A	7.3	A	7.4
• SB Left-Through-Right	D	A	7.5	A	7.3
• WB Approach		A	9.5	B	11.4
• EB Approach		B	10.3	B	11.7
Avenue 16 at SR-99 SB ramps	C	A	9.34	B	11.26
Avenue 16/Avenue 16 connector at SR-99 NB ramps	C				
• EB Left		B	10.1	B	10.6
Avenue 16 at SR-99 NB ramp connector					
• SB Left-Through	C	A	7.6	A	8.0
• WB Right		A	8.8	A	9.3
Gateway/Avenue 16 at SR-99 NB Ramps					
• WB Left	C	A	9.6	B	10.6
Cleveland Avenue/Avenue 15½ at SR-99 NB ramps	C	B	12.3	B	16.4
Cleveland Avenue/Avenue 15½ at SR-99 SB ramps	C	B	11.6	B	15.3
SR-145/Madera Avenue at SR-99 NB ramps	C	C	27.3	C	21.9
Olive Avenue/Avenue 14 at SR-99 SB off-ramp	C	B	13.9	B	15.3
Olive Avenue/Avenue 14/SR-99 SB on-ramp at SR-145	C	C	25.1	C	34.9
Avenue 18½ at Pistachio Drive					
• EB Approach	D	A	8.3	A	8.4
• SB Approach		B	12.4	B	13.8
Avenue 18½ at Golden State Boulevard					
• EB Approach	D	A	7.6	A	7.7
• SB Approach		B	10.6	B	11.0

NOTES: **Bold** text denotes unacceptable LOS
NB = northbound, SB = southbound
[1] delay in seconds per vehicle
SOURCE: TPG Consulting, Inc. 2006; AES 2006.



SOURCE: TPG Consulting, Inc., 2005; AES, 2005

Figure 3.8-5
Madera Site – Existing Intersection Volumes



SOURCE: TPG Consulting, Inc., 2005; AES, 2005

Figure 3.8-6
Madera Site – Existing Intersection Volumes

NORTH FORK SITE

Transportation/Circulation

Existing Circulation Network

Streets and highways in the North Fork site vicinity include Mission Drive (Federal Road 209), Road 225 (Mammoth Pool Road), Rainbow Drive, Cascadel Road, Road 222 (Auberry Road), North Fork Road (Road 200), and Road 274 (Malum Ridge Road). The North Fork site bounded by Mammoth Pool Road on the west, Mission Drive on the north and Rainbow Drive to the south. **Figure 3.8-7** shows major roadways in the vicinity of the North Fork site. The following is a description of the major roadways in the vicinity of the North Fork site:

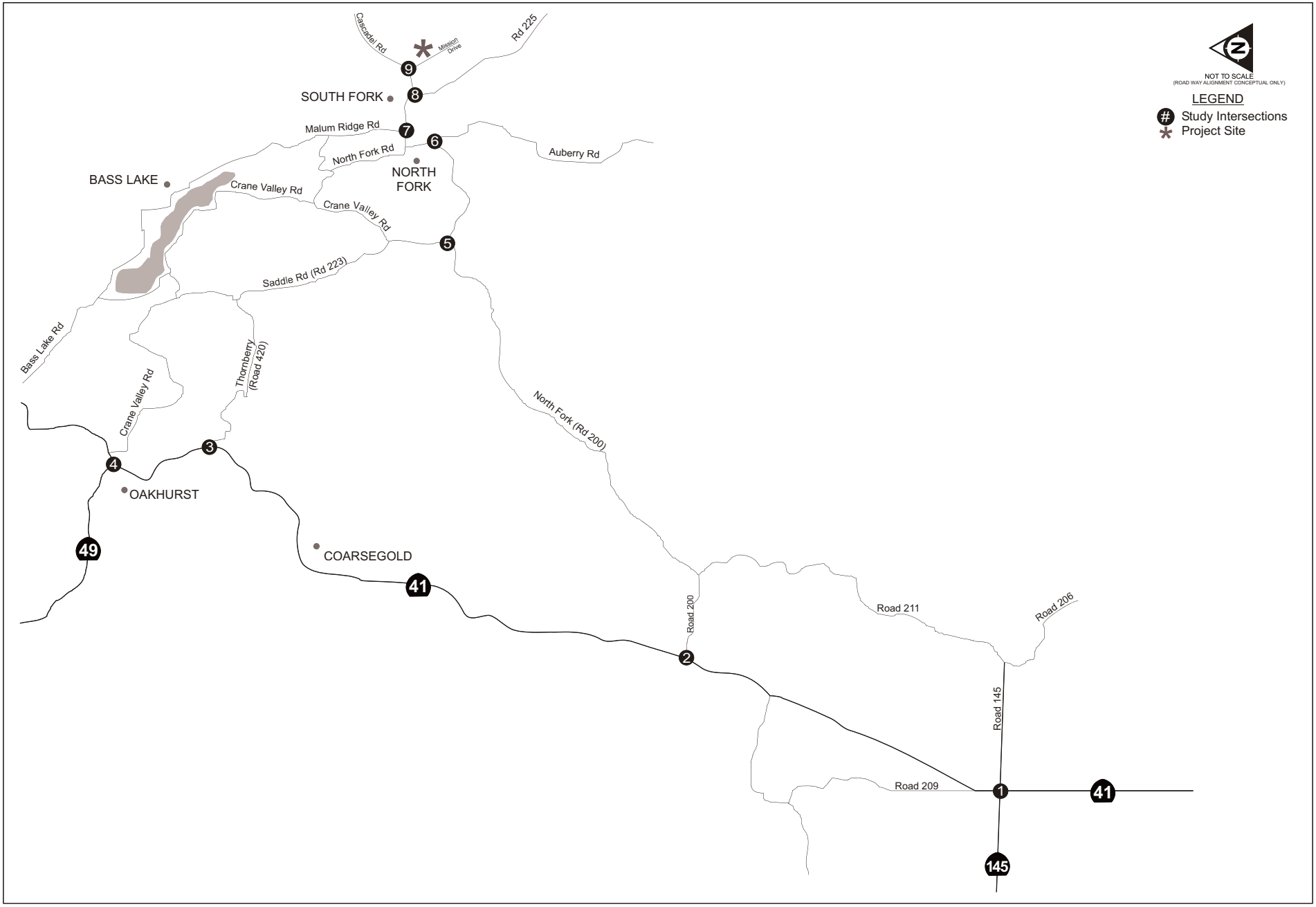
- State Route 49 (SR-49) is a two-lane highway with a posted speed limit if 35 mph.
- Road 200 is a two-lane county roadway with a posted speed limit of 55 mph.
- Road 420 (Thornberry Road) is a two-lane county roadway with no posted speed limit.
- State Route 41 (SR-41) in the North Fork site vicinity varies from two to four lanes with a posted speed limit varying from 45 to 55 mph.
- State Route 145 (SR-145) in the North Fork site vicinity is a two-lane highway varying to a county road with a posted speed limit of 55 mph.
- Road 274 (Malum Ridge Road) is a two-lane county roadway with a posted speed limit of 55 mph.
- Road 225 (Mammoth Pool Road) is a two-lane county roadway with a posted speed limit of 35 mph.
- Cascadel Road is a two-lane county roadway with a posted speed limit of 35 mph.
- Mission Drive is a two-lane county roadway with no posted speed limit.
- North Fork Road is a two-lane county roadway with a posted speed limit of 55 mph.
- Auberry Road is a two-lane county roadway with no posted speed limit.
- Crane Valley Road is a two-lane roadway with a posted speed limit of 55 mph.

Transit, Bicycle and Pedestrian Facilities

Transit. Madera County has one private taxi operator that provides service seven days per week, 24 hours per day.

Bicycle. There are currently no bike paths, lanes, or routes located in the study area surrounding the North Fork site.

Pedestrian. There are no pedestrian sidewalks, walking trails, or other areas separated from the roadways in the immediate vicinity of the North Fork site.



SOURCE: TPG Consulting, Inc., 2005; AES, 2005

Figure 3.8-7
North Fork Site – Major Roadways and Study Intersections

Analysis Methodologies

The analysis methodologies used are the same as for the Madera site.

LOS Thresholds

The LOS thresholds are the same as for the Madera site.

Study Intersections

The proposed project will generate new vehicular trips that will increase traffic volumes on the nearby street network. To assess changes in traffic conditions associated with the project, the following intersections were evaluated:

1. SR-145 at SR-41
2. SR-41 at Road 200
3. SR-41 at Thornberry Road
4. SR-41 at SR-49
5. Malum Ridge Road at Road 225 (Mammoth Pool Road)
6. Road 225 (Mammoth Pool Road) at Cascadel Road
7. Cascadel Road at Mission Drive (Federal Road 209) – Site Access
8. North Fork Road at Auberry Road
9. North Fork Road at Crane Valley Road

Figure 3.8-8 presents the existing lane geometry and traffic control for these study intersections.

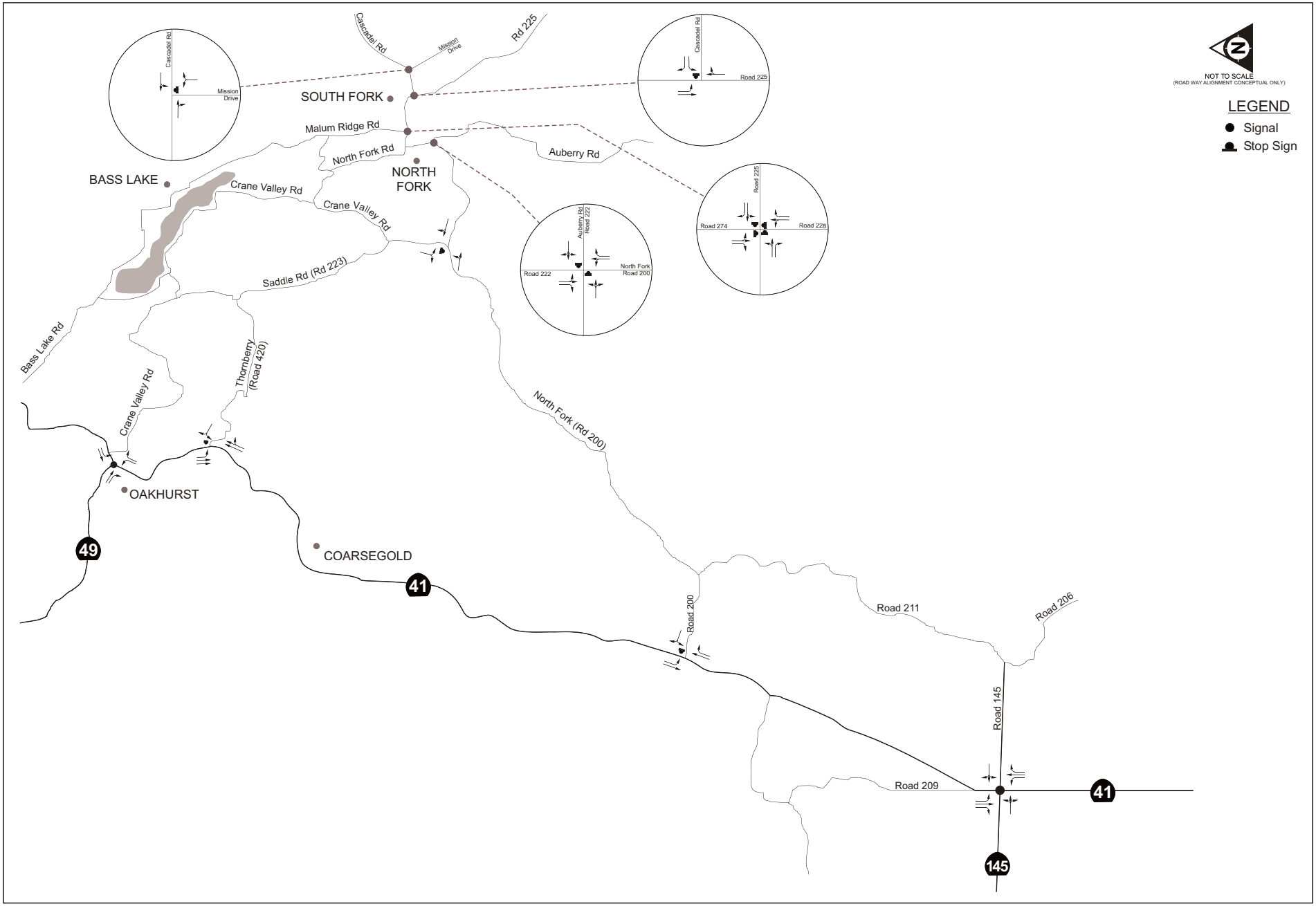
Data Collection

Traffic volumes were collected in accordance with Caltrans *Guide for the Preparation of Traffic Impact Studies* (Caltrans, 2001). **Table 3.8-7** details when traffic data was collected at each study intersection.

Peak Hour Intersection Performance

Table 3.8-8 summarizes the results of this intersection analysis for the existing level of service conditions and shows the intersection delay experienced per vehicle. As shown below, based on existing level of service, the intersection of SR-41 at Road 200 currently operates at an unacceptable LOS.

Figure 3.8-9 presents the existing intersection volumes for each of the North Fork site study intersections.



SOURCE: TPG Consulting, Inc., 2005; AES, 2005

Figure 3.8-8

North Fork Site – Existing Lane Configuration and Intersection Control

TABLE 3.8-7
INTERSECTION DATA COLLECTION PERIOD – NORTH FORK SITE

Intersections	AM Peak Hour		PM Peak Hour	
	Day	Date	Day	Date
SR-41 at SR-145	Tuesday	8/30/05	Tuesday	8/30/05
SR-41 at Road 200	Tuesday	8/30/05	Tuesday	8/30/05
SR-41 at Thornberry Road	Tuesday	8/30/05	Tuesday	8/30/05
SR-41 at SR-49	Wednesday	4/13/05	Wednesday	4/13/05
Road 274 (Malum Ridge Road) at Road 225 (Mammoth Pool Road)	Wednesday	4/13/05	Wednesday	4/13/05
Road 225 (Mammoth Pool Road) at Cascadel Road	Wednesday	4/13/05	Wednesday	4/13/05
North Fork Road at Auberry Road	Tuesday	4/19/05	Tuesday	4/19/05
North Fork Road at Crane Valley Road	Tuesday	4/19/05	Tuesday	4/19/05
Cascadel Road at Mission Drive (Federal Road 209)	Tuesday	4/19/05	Tuesday	4/19/05

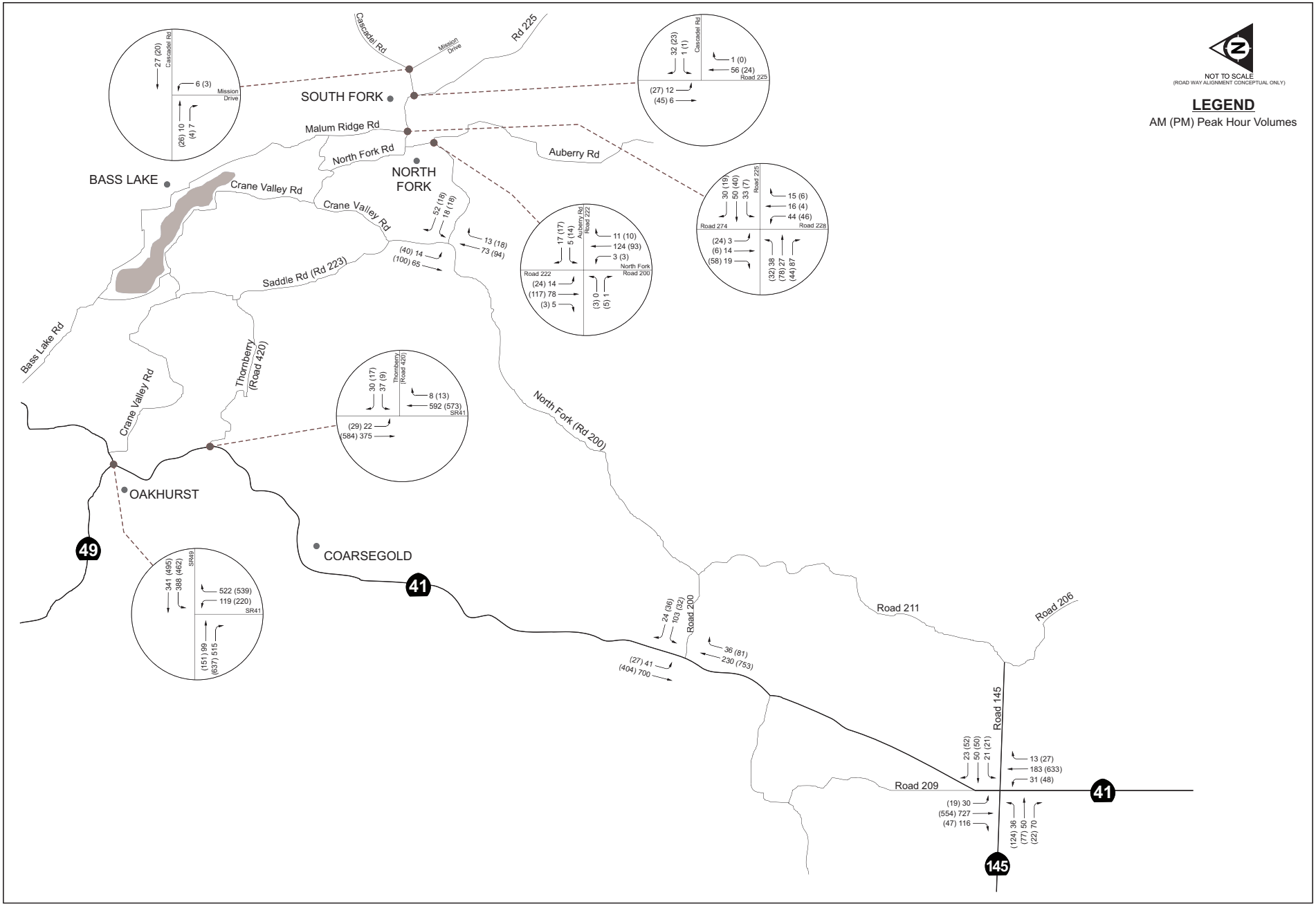
SOURCE: TPG Consulting, Inc., 2006; AES, 2006.

TABLE 3.8-8
EXISTING INTERSECTION PERFORMANCE – NORTH FORK SITE

Intersection	LOS Threshold	Existing			
		AM		PM	
		LOS	Delay (secs)[1]	LOS	Delay (secs)
SR-145 at SR-41	C	B	16.3	C	22.1
SR-41 at Road 200					
• SB Left	C	A	8.0	B	10.2
• WB Approach		**E**	**40.2**	**D**	**29.9**
SR-41 at Thornberry Road					
• SB Left	C	A	9.1	A	9.1
• WB Approach		C	18.0	C	15.3
SR-41 at SR-49	C	A	9.8	B	16.2
Malum Ridge Road at Road 225 (Mammoth Pool Road)	D	A	8.57	A	8.57
Road 225 (Mammoth Pool Road) at Cascadel Road					
• SB Left	D	A	7.4	A	7.3
• WB Approach		A	8.8	A	8.6
Cascadel Road at Mission Drive (Federal Road 209)					
• WB Left-Through	D	A	7.3	A	7.3
• NB Approach		A	8.7	A	8.7
North Fork Road at Auberry Road					
• NB Let-Through-Right		A	7.4	A	7.5
• SB Left-Through-Right	D	A	7.6	A	7.5
• WB Approach		A	9.4	A	9.9
• EB Approach		A	1.0.0	A	9.9
North Fork Road at Crane Valley Road					
• EB Left-Through	D	A	7.5	A	7.4
• SB Approach		A	9.2	A	9.8

NOTES: **Bold** text denotes unacceptable LOS.
[1] delay in seconds per vehicle

SOURCE: TPG Consulting 2006; AES 2006.



SOURCE: TPG Consulting, Inc., 2005; AES, 2005

Figure 3.8-9
North Fork Site – Existing Intersection Volumes

3.8.2 LAND USE

REGIONAL SETTING

Madera County encompasses 1,374,160 acres (2,147 square miles) and is located in the approximate center of California. The County consists of the region from the San Joaquin Valley to the Sierra Nevada Mountain Range. The Chowchilla River forms the northern boundary of Madera County and the San Joaquin River is located on the southern boundary. The County includes some of the most productive agricultural land in the nation. The cities of Chowchilla and Madera are located within the County along with the unincorporated communities of Ahwahnee, Bass Lake, Berenda, Coarsegold, Fairmead, Madera Ranchos, North Fork, Oakhurst, O'Neals, Raymond, and Rolling Hills (Madera, 2004). The main transportation route through the county is SR-99, a north-south route connecting the Bakersfield area to the south and the Sacramento area to the north.

Landscape characteristics, administrative boundaries, and infrastructure have affected how rural land use has developed within Madera County. Madera County commonly develops in blocks of rural subdivisions in one to five square mile units. Rural subdivisions are most common to the north and east of existing cities at the base of the foothills. Irregular configurations of low-density residential development occur at higher elevations along Highways 41 and 168 toward the Sierra Mountains (DLRP, 2005).

MADERA COUNTY GENERAL PLAN

The purpose of the Madera County General Plan is to create a comprehensive, long-term planning guideline for development throughout the County. The Madera County General Plan, published in October 1995, consists of two separate but interrelated documents: the Background Report and the Policy Document. The Background Report inventories and analyzes existing conditions and trends in Madera County. The General Plan Policy Document constitutes Madera County's formal policies for land use, development, and environmental quality. It includes: goals, policies, and standards; implementation programs; and the Land Use Diagram and the Circulation Plan Diagram. County-stated goals are the underlying motivation for development; these goals are general in nature and immeasurable. A County policy is a specific statement, in text or diagram, intended to guide action and implies a clear commitment.

Policies and Goals

The general plan sets policies and standards for the maintenance and improvement of existing development and for determining the location and characteristics of future development. **Table 3.8-9** shows General Plan goals and policies that are currently applicable to the Madera site and the North Fork site, and are relevant to development proposed by project alternatives (**Section 4.8**).

TABLE 3.8-9
MADERA COUNTY GENERAL PLAN APPLICABLE GOALS AND POLICIES

Goals and Policies	
Commercial Land Uses	
Goal	
Goal 1.D	To designate adequate commercial land for and promote development of commercial uses to meet the present and future needs of Madera County residents and visitors and maintain economic vitality.
Section	**Policy**
1.D.4	To designate adequate commercial land for and promote development of commercial uses to meet the present and future needs of Madera County residents and visitors and maintain economic vitality.
Jobs-Housing Balance	
Goal	
Goal 1.F	To work toward a jobs-housing balance in existing urban areas and new growth areas.
Section	**Policy**
1.F.2	Designate and encourage the development of employment-generating uses in appropriate areas near existing and designated residential development.
Visual and Scenic Resources	
Goal	
Goal 1.H	To protect the visual and scenic resources of Madera County as important quality-of-life amenities and asset in the promotion of recreation and tourism.
Section	**Policy**
1.H.1	Require that new development in scenic rural areas avoid locating structures along ridgelines, on steep slopes, or in other highly-visible locations, except when the location is necessary to avoid hazards or when the screening measures to minimize the visibility of structures and graded areas are incorporated into the project.
1.H.2	Require new development incorporates sound soil conservation practices and minimizes land alterations.
Streets and Highways	
Goal	
Goal 2.A	To provide for the long-range planning and development of the County's roadway system, ensure the safe and efficient movement of people and goods, and provide sufficient access to existing and new development.
Section	**Policy**
2.A.9	To identify the potential impacts of new development on traffic service levels, the County shall require the preparation of traffic impact analyses for developments determined to be large enough to have potentially significant traffic impacts. The County may allow exceptions to the level of service standards where it finds that the improvements or other measures required to achieve the LOS standards are unacceptable.
2.A.17	Require proposed new development projects to analyze their contribution to increased traffic and to implement improvements necessary to address the increase.
2.A.19	Assess fees on new development sufficient to cover the fair share portion of that development's impacts on the local and regional transportation system. Exceptions may be made when new development generates significant public benefits and when alternative sources of funding can be identified to offset foregone revenues.

Goals and Policies

2.A.21 Require that new nonresidential development provide for off-street parking, either on-site or through contributions to consolidated lots or structures, particularly where these facilities are located in or near residential areas.

Transit

Goal

Goal 2.B To promote a safe and efficient mass transit system, including both rail and bus, to reduce congestion, improve the environment, and provide viable non-automotive means of transportation in and through Madera County

Section **Policy**

2.B.7 Require new development to provide sheltered public transit stops, with turnouts. The County will also consider development of turnouts in existing developed areas when roadway improvements are made or as deemed necessary for traffic flow and public safety.

Transportation Control Measures (TCM)

Goal

Goal 2.C To maximize the efficient use of transportation facilities so as to: 1) reduce travel demand on the County's roadway system; 2) reduce the amount of investment required in new or expanded facilities; 3) reduce the quantity of emissions of pollutants from automobiles; and 4) increase the energy efficiency of the transportation system.

Section **Policy**

2.C.4 Encourage major traffic generators to develop and implement trip reduction measures.

2.C.5 Require major development projects to prepare transportation studies that address potential use of bicycle routes and facilities and the use of public transportation.

Non-motorized Transportation

Goal

Goal 2.D To provide a safe, comprehensive, and integrated system of facilities for non-motorized transportation to meet the needs of commuters and recreational users.

Section **Policy**

2.D.7 Require developers to finance and install pedestrian walkways, equestrian trails, and multi-purposed paths in new development, as appropriate.

General Public Facilities and Services

Goal

Goal 3.A To ensure the timely development of public facilities and to maintain an adequate level of service to meet the needs of existing and future development.

Section **Policy**

3.A.1 Ensure through the development review process that adequate public facilities and services are available to serve new development. The County shall not approve new development where existing facilities are inadequate unless the applicant can demonstrate that all necessary public facilities will be installed or adequately financed and maintained (through fees or other means).

Public Facilities and Services Funding

Goal

Goal 3.B To ensure that adopted facility and service standards are achieved and maintained through the use of equitable funding methods.

Section **Policy**

3.B.1 Require that new development pay its fair share of the cost of developing new facilities and services and upgrading existing public facilities and services subject to the requirements of California Government Code Section 66000, et seq. (AB1600); exceptions may be made when

Goals and Policies

new development generates significant public benefits (e.g., low income housing) and when alternative sources of funding can be identified to offset foregone revenues.

Water Supply and Delivery

Goal

Goal 3.C To ensure the availability of an adequate and safe water supply and the maintenance of high quality water in water bodies and aquifers used as sources of domestic and agricultural water supply.

Section **Policy**

3.C.1 Approve new development only if an adequate water supply to serve such development is demonstrated.

3.C.2 Approve new development based on the following guidelines for water supply:

a. Urban and suburban development should rely on community water systems.
b. Rural communities should rely on community water systems. Individual wells may be permitted in cases where no community water system exists or can be extended to the property but development will be limited to densities which can be safely developed with wells.
c. Agricultural areas should rely on public water systems where available, otherwise individual water wells are acceptable.

3.C.3 Limit development in areas identified as having severe water table depression to uses that do not have high water usage or to uses served by a surface water supply.

3.C.4 Require that water supplies serving new development meet state water quality standards.

3.C.5 Require that new development adjacent to bodies of water used as domestic water sources adequately mitigate potential water quality impacts on these water bodies.

3.C.6 Promote efficient water use and reduced water demand by:

a. Requiring water-conserving design and equipment in new construction.
b. Encouraging water-conserving landscaping and other conservation measures;
c. Encouraging retrofitting existing development with water-conserving devices; and
d. Encouraging use of recycled or gray water for landscaping.

3.C.7 Promote the use of reclaimed wastewater to offset the demand for new water supplies.

Wastewater Collection, Treatment and Disposal

Goal

Goal 3.D To ensure adequate wastewater collection and treatment and the safe disposal of liquid and solid waste.

Section **Policy**

3.D.2 Promote efficient water use and reduced wastewater system demand by:

a. Requiring water-conserving design and equipment in new construction;
b. Encouraging retrofitting with water-conserving devices; and
c. Designing wastewater systems to minimize inflow and infiltration, to the extent economically feasible.

3.D.3 Permit on-site sewage treatment and disposal on parcels where all current regulations can be met; where parcels have the area, soils, and other characteristics that permit such disposal facilities without threatening surface or groundwater quality or posing any other health hazards; and where community sewer service is not available and cannot be provided.

Goals and Policies

3.D.4	Require that the development, operation, and maintenance of on-site disposal systems complies with the requirements and standards of the County Department of Environmental Health.

Storm Drainage and Flood Control

Goal

Goal 3.E	To provide efficient, cost-effective, and environmentally sound storm drainage and flood control facilities.

Section	**Policy**
3.E.2	Require new development to provide protection from the 100-year flood as a minimum.
3.E.4	Require new development to pay its fair share of the costs of Madera County storm drainage and flood control improvements.
3.E.5	Encourage project designs that minimize drainage concentrations and impervious coverage and maintain, to the extent feasible, natural site drainage conditions.
3.E.6	Future drainage system discharges shall comply with applicable state and federal pollutant discharge requirements.
3.E.7	Encourage the use of natural stormwater drainage systems to preserve and enhance natural features.

Landfills, Transfer Stations, and Solid Waste Recycling

Goal

Goal 3.F	To ensure the safe and efficient disposal or recycling of solid waste generated in Madera County.

Section	**Policy**
3.F.2	Promote maximum use of solid waste source reduction, recycling, composting, and environmentally safe transformation of wastes.
3.F.6	Require that all new development comply with applicable provisions of the Madera County Integrated Waste Management Plan.

Law Enforcement, Fire, and Emergency Medical Services

Goal

Goal 3.G	To ensure the prompt and efficient provision of law enforcement, fire, and emergency medical facility and service needs.

Section	**Policy**
3.G.3	Require new development to pay its fair share of the costs for providing law enforcement, fire, and emergency medical facilities, subject to the requirements of California Government Code Section 66000 et seq. (AB1600).
3.G.4	Require that new development be designed to maximize safety and security and minimize fire hazard risks to life and property.

Fire Protection Services

Goal

Goal 3.H	To protect residents of and visitors to Madera County from injury and loss of life and to protect property and watershed resources from fires.

Section	**Policy**
3.H.4	Require new development to develop or fund fire protection facilities that, at a minimum, maintain the (above) service level standards (see Policy 3.H.1 or 3.H.2 in the Madera County General Plan Policy Document or **Section 3.8** of this document for service level standards).

Goals and Policies

3.H.5	Ensure that all proposed developments are reviewed for compliance with fire safety standards by responsible local fire agencies per the Uniform Fire Code and other state and local ordinances.

Utilities

Goal

Section	Policy
3.J.3	Require proposed new development in identified underground conversion districts and along scenic corridors to construct underground utility lines on and adjacent to the site of proposed development or, when this is infeasible, to contribute funding for future undergrounding.

Agriculture and Natural Resources

Goal

Goal 5A	To designate adequate agricultural land and promote development of agricultural uses to support the continued viability of Madera County's agricultural economy.

Section	Policy
5.A.1	Maintain agriculturally designated areas for agricultural uses and direct urban uses to designated new growth areas, existing communities, and/or cities.
5.A.2	Discourage the conversion of prime agricultural land to urban uses unless an immediate and clear need can be demonstrated that indicates a lack of land for non-agricultural uses.
5.A.3	Ensure that new development and public works projects do not encourage further expansion of urban uses into designated agricultural areas.
5.A.5	Allow the conversion of existing agricultural land to urban uses only within designated urban and rural residential areas, new growth areas, and city spheres of influence where designated for urban development on the General Plan Land Uses Diagram.
5.A.6	Encourage continued and, where possible, increased agricultural activities on lands designated for agricultural uses.
5.A.13	Require development within or adjacent to designated agricultural areas to incorporate design, construction, and maintenance techniques that protect agriculture and minimize conflicts with adjacent agricultural uses.

Water Resources

Goal

Goal 5.C	To protect and enhance the natural qualities of Madera County's streams, creeks and groundwater.

Section	Policy
5.C.2	Minimize sedimentation and erosion through control of grading, cutting of trees, removal of vegetation, placement of roads and bridges, and use of off-road vehicles. The County shall discourage grading activities during the rainy season, unless adequately mitigated, to avoid sedimentation of creeks and damage to riparian habitat.
5.C.3	Require new development of facilities near rivers, creeks, reservoirs, or substantial aquifer recharge areas to mitigate any potential impacts of release of pollutants in floodwaters or flowing river, stream, creek, or reservoir waters.
5.C.4	Require the use of feasible and best management practices (BMPs) to protect streams from the adverse effects of construction activities, and shall encourage the urban storm drainage systems and agricultural activities to use BMPs.

Goals and Policies

5.C.5 Approve only wastewater disposal facilities that will not contaminate groundwater or surface water.

5.C.7 Protect groundwater resources from contamination and further overdraft by encouraging water conservation efforts and supporting the use of surface water for urban and agricultural uses wherever feasible.

Wetland and Riparian Areas

Goal

Goal 5.D To protect wetland communities and related riparian areas throughout Madera County as valuable resources.

Section **Policy**

5.D.1 Comply with the wetlands policies of the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, and the California Department of Fish and Game. Coordination with these agencies at all levels of project review shall continue to ensure that appropriate mitigation measures and the concerns of these agencies are adequately addressed.

5.D.2 Require new development to mitigate wetland loss in both regulated and non-regulated wetlands through any combination of avoidance, minimization, or compensation. The County shall support mitigation banking programs that can provide the opportunity to mitigate impacts to rare, threatened, and endangered species and/or the habitat which supports these species in wetland and riparian areas.

5.D.3 Development should be designed in such a manner that pollutants and siltation will not significantly adversely affect the value or function of wetlands.

5.D.4 Require riparian protection zones around natural watercourses. Riparian protection zones shall include the bed and bank of both low- and high-flow channels and associated riparian vegetation, the band of riparian vegetation outside the high-flow channel, and buffers of 100 feet in width as measured form the top of bank of unvegetated channels and 50 feet in width as measured from the outer edge for the canopy of riparian vegetation. Exceptions may be made in existing developed areas where existing development and lots are located within the setback areas.

5.D.5 Identify and conserve remaining upland habitat areas adjacent to wetlands and riparian areas that are critical to the feeding or nesting of wildlife species associated with these wetland and riparian areas.

5.D.6 Require new private or public developments to preserve and enhance existing native riparian habitat unless public safety concerns require removal of habitat for flood control or other public purposes. In cases where new private or public development results in modification or destruction of riparian habitat for purposes of flood control, the developers shall be responsible for creating new riparian habitats within or near the project area at a ration of three acres of new habitat for every acre destroyed.

Fish and Wildlife Habitat

Goal

Goal 5.E To protect, restore, and enhance habitats that support fish and wildlife species so as to maintain populations at viable levels.

Section **Policy**

5.E.2 Require development in areas known to have particular value of wildlife to be carefully planned and, where possible, located so that the reasonable value of the habitat for wildlife is maintained.

5.E.3 Encourage private landowners to adopt sound wildlife habitat management practices, as recommended by the California Department of Fish and Game officials and the U.S. Fish and Wildlife Service.

Vegetation

Goals and Policies

Goal

Goal 5.F To preserve and protect the valuable vegetation resources of Madera County.

Section	Policy
5.F.1	Encourage landowners and developers to preserve the integrity of existing terrain and natural vegetation in visually sensitive areas such as hillsides and ridges, and along important transportation corridors.
5.F.2	Require developers to use native and compatible non-native species, especially drought-resistant species, to the extent possible in fulfilling landscaping requirements imposed as conditions of discretionary permit approval or for project mitigation.
5.F.6	Require that new development preserve natural woodlands to the maximum extent possible.

Open Space for the Preservation of Natural Resources

Goal

Goal 5.H To preserve and enhance open space lands to maintain the natural resources of the County.

Section **Policy**

5.H.2 Require that new development be designed and constructed to preserve the following types of areas and features as open space to the maximum extent feasible:

a. High erosion hazard areas;
b. Scenic and trial corridors;
c. Streams and streamside vegetation;
d. Wetlands;
e. Other significant stands of vegetation;
f. Wildlife corridors; and
g. Any areas of special ecological significance.

5.H.5 Require that significant natural, open space, and cultural resources be identified in advance of development and incorporated into site-specific development project design.

Air Quality

Goal

Goal 5.J To protect and improve air quality in Madera County and the region.

Section	Policy
5.J.5	Require new development projects that exceed adopted SJVUAPCD emission thresholds to submit an air quality analysis for review and approval. Based on this analysis, the County shall require appropriate mitigation measures consistent with the SJVUAPCD's 1991 Air Quality Attainment Plan (or updated edition).
5.J.11	Require developers to pave all access roads, driveways, and parking areas serving new commercial and industrial development.

Air Quality - Transportation/Circulation

Goal

Goal 5.K To integrate air quality planning with the transportation planning process.

5.K.1	Require new development to be planned to result in smooth flowing traffic conditions for major roadways. This includes traffic signals and traffic signal coordination, parallel roadways, and intra- and inter-neighborhood connections where significant reductions in overall emissions can be achieved.
5.K.5	Require large new developments to dedicate land for and construct appropriate improvements for suitably located park-and-ride lots, subject to the requirements of California Government Code

Goals and Policies

Section 66000 et seq. (AB 1600).

Seismic and Geological Hazards

Goal

Goal 6.A To minimize loss of life, injury, and property damage due to seismic and geological hazards.

Section	Policy
6.A.1	Require the preparation of a soils engineering and geologic-seismic analysis prior to permitting development in areas prone to geological or seismic hazards (i.e., groundshaking, landslides, liquefaction, critically expansive soils).

Flood Hazards

Goal

Goal 6.B To minimize the risk of loss of life, injury, damage to property, and economic and social dislocations resulting form flood hazards.

Section	Policy
6.B.1	Require flood-proofing of structures in areas subject to flooding.
6.B.3	Restrict uses in designated floodways to those that are tolerant of occasional flooding and do not restrict or alter flow of floodwaters. Such uses may include agriculture, outdoor recreation, mineral extraction, and natural resource areas.
6.B.4	Require that all development within areas subject to 100-year floods be designed and constructed in a manner that will not cause floodwaters to be diverted onto adjacent property or increase flood hazards to other areas.
6.B.5	Require flood control structures, facilities, and improvements to be designed to conserve resources, incorporate and preserve scenic values, and to incorporate opportunities for recreation, where appropriate.

Fire Hazards

Goal

Goal 6.C To minimize the risk of loss of life, injury, and damage to property and watershed resources resulting from unwanted fires.

Section	Policy
6.C.3	New development shall be required to have water systems that meet County fire flow requirements. Where minimum fire flow is not available to meet County standards, alterative fire protection measures, including sprinkler systems, shall be identified and may be incorporated into development if approved by the appropriate fire protection agency.
6.C.4	The County shall review project proposals to identify potential fire hazards and prevent or mitigate such hazards to acceptable levels of risk.
6.C.5	Require development to have adequate access for fire and emergency vehicles and equipment. All major subdivisions shall have two points of ingress and egress.

Airport Hazards

Goal

Goal 6.D To minimize the risk of loss of life, injury, damage to property, and economic and social dislocations resulting from airport hazards.

Section	Policy

Goals and Policies

6.D.1	Ensure that new development around airports does not create safety hazards such as lights from direct or reflective sources, smoke, electrical interference, hazardous chemicals, or fuel storage in violation of adopted safety standards.
6.D.2	Limit land uses in airport safety zones to those uses listed in the applicable airport comprehensive land use plans (CLUPs) as compatible uses. Exceptions shall be made only as provided for in the CLUPs. Such uses shall also be regulated to ensure compatibility in terms of location, height, and noise.

Noise

Goal

Goal 7.A	To protect County residents from the harmful and annoying effects of exposure to excessive noise.

Section	**Policy**
7.A.2	Noise created by new transportation noise sources, including roadway improvement projects, shall be mitigated so as not to exceed 60 db L_{dn} within the outdoor activity areas of existing or planned noise-sensitive land uses and 45 dB L_{dn} in interior spaces of existing or planned noise-sensitive land uses.
7.A.5	Noise which will be created by new non-transportation noise sources, or existing noise sources, or existing non-transportation noise sources which undergo modification that may increase noise levels, shall be mitigated so as not to exceed the noise level standards of Table 7.A.4 (of the Madera County General Plan Policy Document) on lands designated for noise-sensitive uses. This policy does not apply to noise levels associated with agricultural operations.
7.A.6	Enforce the State Noise Insulation Standards (California Code of Regulations, Title 24) and chapter 35 of the Uniform Building code (UBC) concerning interior noise exposure for multi-family housing, hotels and motels.
7.A.7	Where the development of a project may result in land uses being exposed to existing or projected future noise levels exceeding the levels specified by the policies of the noise section of the General Plan, the County shall require an acoustical analysis early in the review process so that noise mitigation may be included in the project design.

SOURCE: County of Madera, 1995.

MADERA COUNTY ZONING ORDINANCE

The Madera County Code zoning ordinance (Ord. 525 Section 1) provides specific parameters for development on land within the County. The zoning designation ensures that adequate County resources will be available to support development within the County. The zoning designations also act as guidelines for the safety and efficiency of the public streets and highways; aid in stabilizing the economic vitality of the County; and preserve and promote the aesthetics of the community environment. The zoning designations serve as a guide for the distribution and location of the population and of various land uses.

MADERA SITE

The Madera site consists of agricultural land and one single-family rural residential unit. For the last 10 years, the site has been used for non-irrigated feed grain crops such as oat, a winter crop. No crops were planted in 2005 (Shaw, pers. comm., 2005).

Land uses within Madera County are predominantly agricultural. Land uses surrounding the Madera site include light industrial, rural residential, highway service commercial, commercial, recreational and airport. Vacant agricultural, abandoned greenhouses, vacant land, and a single-family residence are located to the north of Avenue 18 adjacent to the Madera site. A junkyard is located south of Avenue 18 between the Madera site and Highway 99. Land directly west of Road 23, adjacent to the Madera site, is used for orchards. The land located directly south-southwest of the Madera site at the northeastern junction of Road 23 and Avenue 17 is used for vineyard and residential uses. The Madera Municipal Airport is located approximately 0.5 miles south of the Madera site across Avenue 17. The Madera Municipal Golf Course is adjacent to the airport.

General Plan and Zoning Designations

General Plan

The Madera County General Plan assigns land a general land use designation to act as overall guidance for Countywide development. The Madera County General Plan land use designation for the Madera site is Agriculture (A) (**Figure 3.8-10**), defined as:

> *Agriculture – This designation provides for agricultural uses, limited agricultural support service uses (e.g., barns, animal feed facilities, silos, stables, fruit stands and feed stores), agriculturally oriented services (e.g., wineries, cotton gins), timber production, mineral extraction, airstrips, public and commercial refuse disposal sites, recreational uses, public and quasi public uses, and similar and compatible uses. The minimum parcel size shall be 18 acres. Allowable residential development in areas designated Agriculture includes one or two single-family homes per parcel, secondary residential units, caretaker/employee housing, and farmworker housing. The FAR for nonresidential uses shall not exceed 0.10, with the following exceptions: the FAR for agriculturally oriented services shall not exceed 0.25 and the FAR for poultry ranches, greenhouses, and similar uses shall not exceed 0.50. This designation assumes an average of 3.2 persons per dwelling unit.*

Zoning

County zoning designations in and surrounding the Madera site include Agricultural, Rural, Exclusive, Twenty Acre District (ARE-20); Commercial, Rural, Highway District (CRH);

Commercial, Rural, General District (CRG); and Agricultural, Rural, Five Acre District (AR-5) (**Figure 3.8-11**).

According to the zoning ordinance (Chapter 18.58, Title 18) of the Madera County Code, the Madera site has been zoned as *ARE-40*, which is defined as "Agricultural, Rural, Exclusive, Forty Acre District" (Madera County, 2005). Permitted uses within the ARE-40 zone include most agricultural uses, single family residential, dormitory or attached multi-family farm labor housing unit, and communication tower/wireless communications facility. Regulations under the zoning designation include setback and offset minimums and maximums, structure height maximums, dimension requirements and off-street parking requirements, as defined in zoning ordinance (Chapter 18.58, Title 18) of the Madera County Code. The Madera site is within the sphere of influence of the City of Madera (City of Madera General Plan, 1992). A sphere of influence is defined as a plan for the expected physical boundaries of a local agency (in this case the City of Madera).

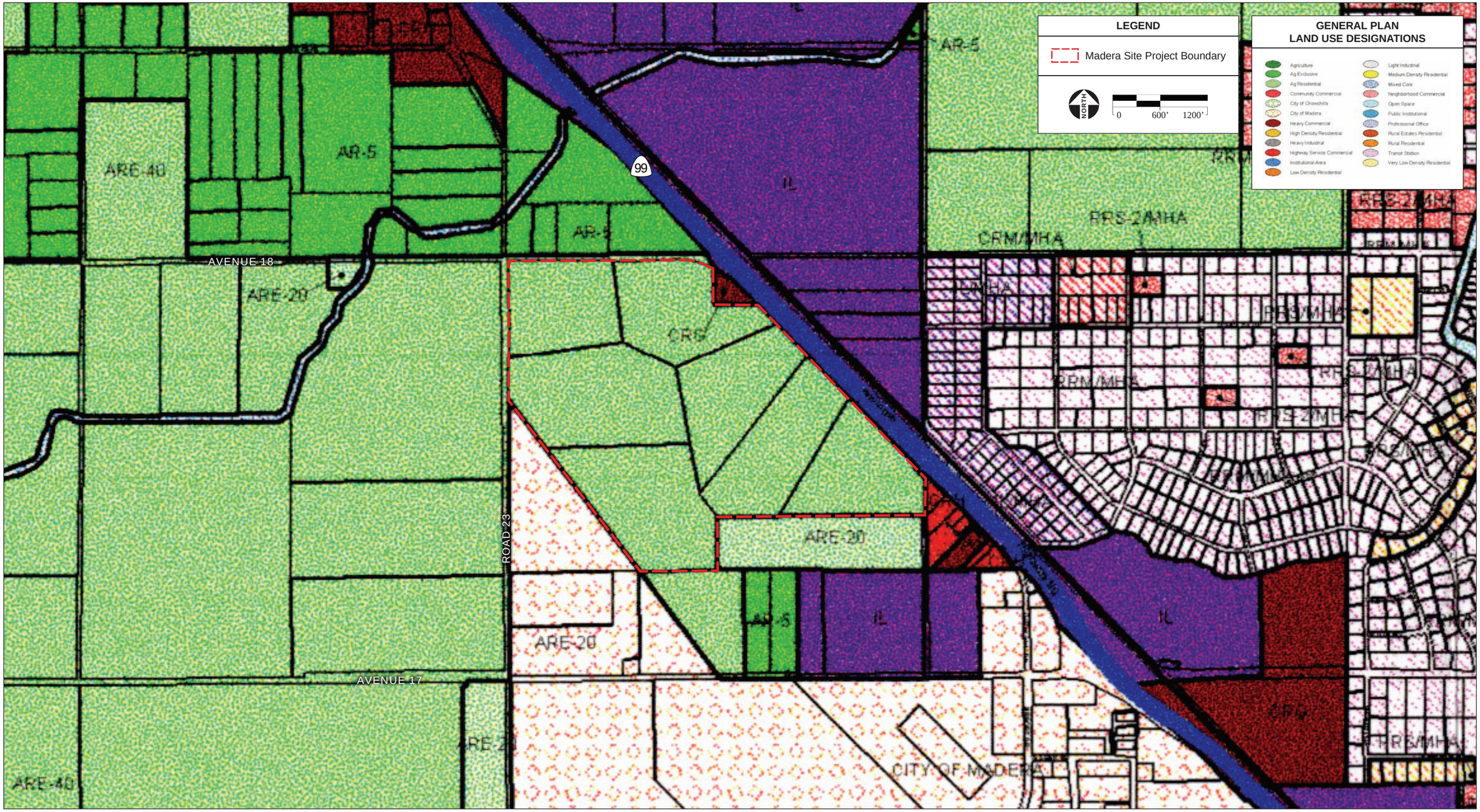
Airport Land Use Compatibility Plan

The City of Madera owns all of the property within the airport runway protection zones, as well as most of the property within the runway protection zones proposed for the future. The Madera

Municipal Airport has 120 non-commercial aircraft based at the airfield. These aircraft include 98 single-engine airplanes, 12 multi-engine airplanes, 1 jet airplane, 1 helicopter and 8 ultralights. Aircraft operations average 139 per day, 75% of which is local general aviation, 24% transient general aviation, less than 1% air taxi and less than 1% military (AirNav, 2005).

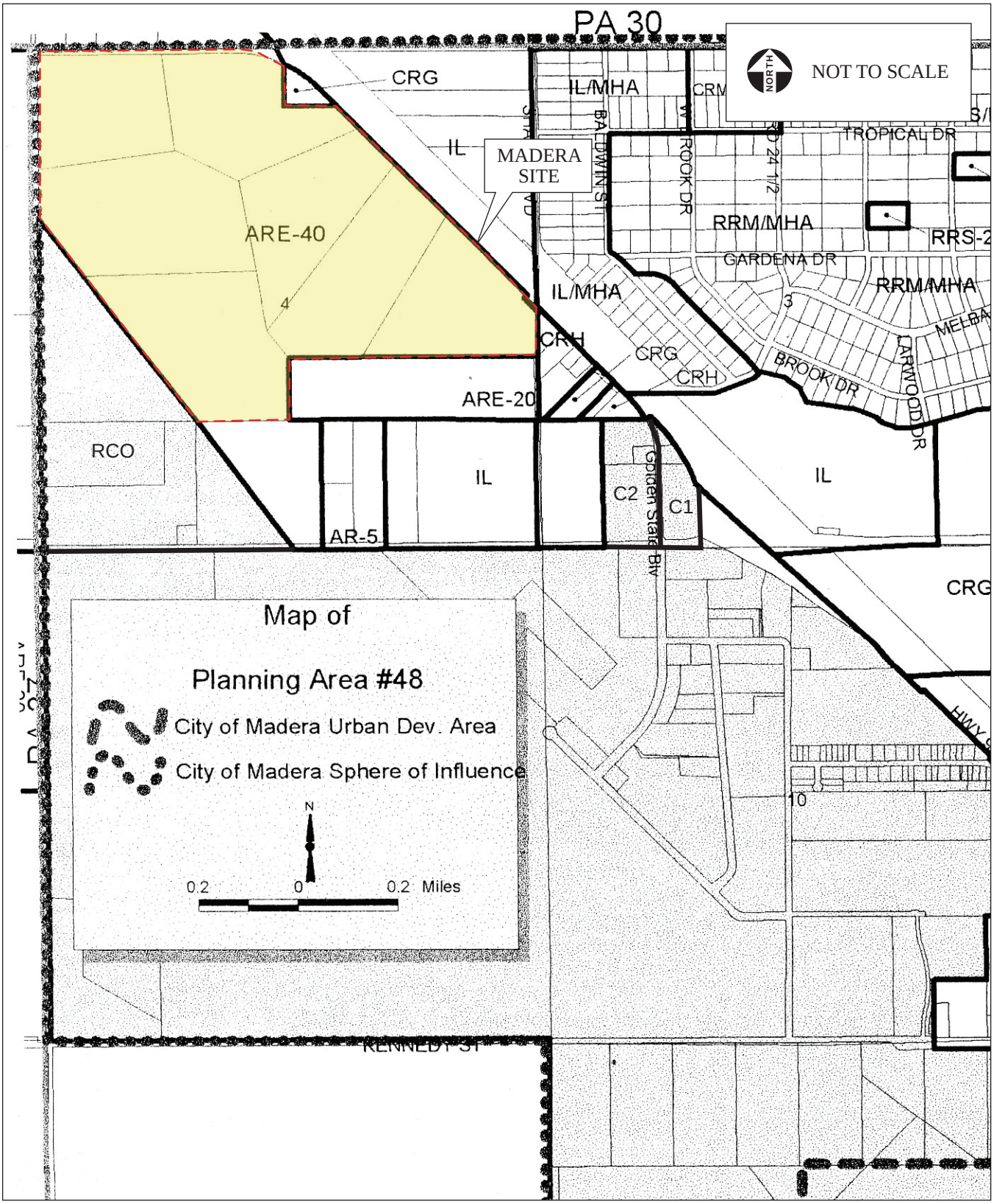
The *Airport Land Use Compatibility Plan*, adopted in December 1993, established the criteria and policies to assess the compatibility between the principal airports in Madera County and proposed land use development in the areas surrounding them (**Table 3.8-10**). The plan specifically applies to land uses surrounding the Chowchilla Municipal Airport and the Madera Municipal Airport. The Madera site is located approximately 0.5 miles north of the Madera Municipal Airport.

Portions of the Madera site are located within Madera Municipal Airport Compatibility Zones A, B1, B2, and D, as defined in the Airport Land Use Plan (most of the site is within Zone D). Zone A is classified as runway protection zone or within building restriction line. Zone A is considered high-risk area and no buildings, including residential, or assemblages of people are allowed in this area. A maximum of 10 people per acre is allowed within this area. Zone B1 is classified as an approach/departure zone and includes any land adjacent to a runway. Zone B2 is classified as an extended approach/departure zone. In Zone B1 aircraft commonly travel below 400 feet above ground level within 1,000 feet of the runway. In Zone B2 aircraft are commonly below 800 feet above ground level. Zone B1 and B2 are considered to be subject to substantial noise.



SOURCE: Madera County General Plan, 10/1995; AES, 2006

Figure 3.8-10
Madera Site General Plan – Alternatives A, B, and C



SOURCE: City of Madera; AES, 2006

Figure 3.8-11

Madera Site Zoning Map – Alternatives A, B, and C

TABLE 3.8-10
MADERA COUNTY AIRPORT LAND USE PLAN – SUPPORTING COMPATIBILITY CRITERIA

Section	Supporting Compatibility Criteria
3.1	**Noise**
3.1.4	Noise Exposure for Other Land Uses – Noise level standards for compatibility with other types of land uses shall be applied in the same manner as the [above] residential noise level criteria (i.e. the maximum CNEL considered normally acceptable for residential uses in the vicinity of the airports covered by the plan is 60 dBA). Examples of acceptable noise levels for other land uses in an airport's vicinity are presented in Table 2B (of the Airport Plan; recreated in **Section 3.10** of this DEIS).
3.2	**Safety**
3.2.2	Risks to People on the Ground – The principal means of reducing risks to people on the ground is to restrict land uses so as to limit the number of people who might gather in areas most susceptible to aircraft accidents.
3.2.3	Land Uses of Particular Concern – Land uses of particular concern are ones in which the occupants have reduced effective mobility or are unable to respond to emergency situations. Schools, hospitals, nursing homes, and other uses in which the majority of occupants are children, the elderly, and the handicapped shall be prohibited within Compatibility Zones A, B, and C.
3.2.4	Other Risks – Any use involving the potential for aboveground explosion or release of toxic or corrosive materials shall be prohibited in Compatibility Zones A and B.
3.2.5	Open Land – In the event that an aircraft is forced to land away from an airport, the risks to people on board can best be minimized by providing as much open land area as possible within the airport vicinity. This concept is based upon the fact that the large majority of aircraft accidents occurring away from an airport runway are controlled emergency landings in which the pilot has reasonable opportunity to select the landing site. (a) To qualify as open land, an area must be: (1) free from structures and other major obstacles such as walls, large trees, and overhead wires; and (2) have minimum dimensions of at least 75 feet by 300 feet. Roads and automobile parking lots are acceptable as open land area if they meet the preceding criteria. (b) Open land requirements for each compatibility zone are to be applied with respect to the entire zone. Individual parcels may be too small to accommodate the minimum-size open area requirement. Consequently, the identification of open land areas must initially be accomplished at the general plan or specific plan level or as part of large-acreage projects. (c) Clustering of development and providing contiguous landscaped and parking areas is encouraged as a means of increase in the size of open land areas (d) Building envelopes and the approach zones should be indicated on all development plans and tentative maps within an airport's planning area in order to assure that individual development projects provide the open land areas identified in a general plan, specific plan, or other large-scale plan.
3.3	**Airspace Protection**
3.3.1	Height Limits – The criteria for limiting the height of structures, trees and other objects in the vicinity of an airport shall be set in accordance with Part 77, subpart c, of the Federal Aviation Regulations and with the United States Standard for Terminal Instrument Procedures (TERPS). Airspace plans for each airport which depict the critical areas for airspace protection are provided in Chapter 4 (of the airport compatibility plan).

Section	Supporting Compatibility Criteria
3.3.2	Avigation Easement Dedication – The owner of any property proposed for development within Compatibility Zones A and B shall be required to dedicate an avigation easement to the jurisdiction owning the airport. (a) The avigation easement shall: (1) provide the right of flight in the airspace above the property; (2) allow the generation of noise and other impacts associated with aircraft overflight; (3) restrict the height of structures, trees and other objects; (4) permit access to the property for the removal or aeronautical marking of objects exceeding the established height limit; and (5) prohibit electrical interference, glare, and other potential hazards to flight from being created on the property. (b) Within Compatibility Zones A and B, height restrictions of less than 35 feet may be required.
3.3.3	Minimum Restriction – Other than within Compatibility Zones A and B, no restrictions shall be set which limit the height of structures, trees, or other objects to less than 35 feet above the level of the ground on which they are located even if the terrain or objects on the ground may penetrate Federal Aviation Regulations Part 77 surfaces.
3.3.5	Other Flight Hazards – Land uses which may produce hazards to aircraft in flight shall not be permitted within any airport's planning area. Specific characteristics to be avoided include: (1) glare or distracting lights which could be mistaken for airport lights; (2) sources of dust, steam, or smoke which may impair pilot visibility; (3) sources of electrical interference with aircraft communications or navigation; and (4) any use which may attract large flocks of birds, especially landfills and certain agricultural uses.

SOURCE: Madera County, 1993; AES, 2006.

Maximum allowable density for both Zone B1 and B2 for uses other than residential is 60 people per acre. The land use should not attract more than the indicated number of people per acre at any time, including all individuals who may be on the property (e.g., employees, customers/visitors, etc.). The densities are intended as general planning guidelines to aid in determining the acceptability of proposed land uses. Zone B1 and B2 are required to be 30% open land, as defined in **Table 3.8-11**. Zone D is classified as other airport environs. It is considered to have negligible safety risk but may have potential for annoyance from overflights. In Zone D there is no limit on land use densities and no requirements for open land.

As indicated in **Figure 3.8-12**, less than a quarter of the Madera site is within Zone B1. A small portion of the Madera site is located in Zones A and B2 and the remainder of the Madera site is within Zone D. Common hazards to flight include: 1) glare or distracting lights which could be mistaken for airport lights, 2) sources of dust, steam, or smoke which may impair pilot visibility, 3) sources of electrical interference with aircraft communications or navigation; and 4) any use which may attract large flocks of birds, especially landfills and certain agricultural uses.

TABLE 3.8-11
MADERA COUNTY AIRPORT LAND USE COMPATIBILITY PLAN – DEVELOPMENT CRITERIA

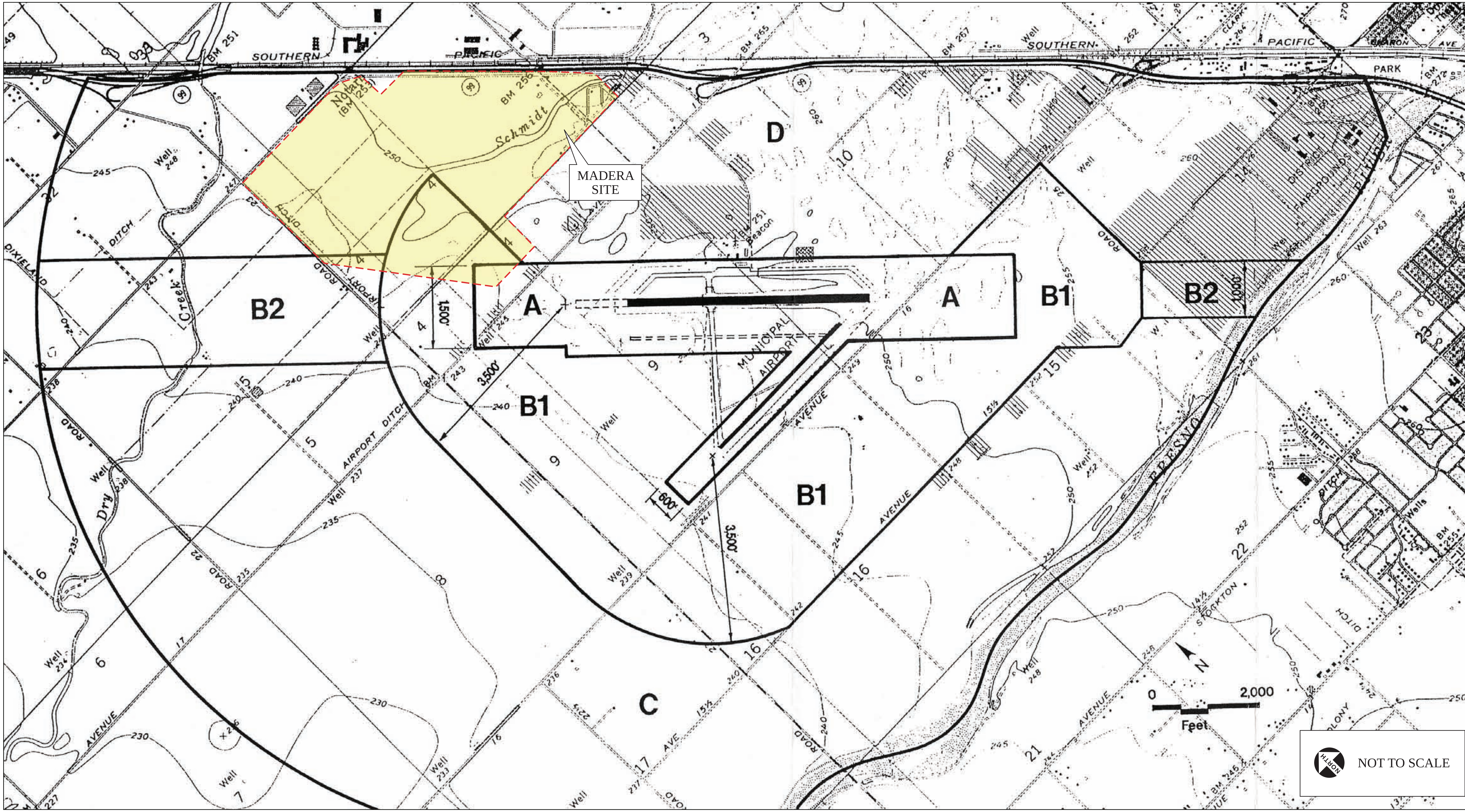
Zone	Development Criteria		Examples	
	Prohibited Uses	**Other Development Conditions**	**Normally Acceptable Uses**	**Uses Not Normally Acceptable**
A	• All structures except ones with location set by aeronautical function. • Assemblages of people. • Objects exceeding FAR Part 77 height limits. • Hazards to flight.	• Dedication of avigation easement.	• Aircraft tiedown apron. • Pastures, field crops, vineyards. • Automobile parking.	• Heavy poles, signs, large trees, etc.
B1 and B2	• Schools, day care centers, libraries. • Hospitals, nursing homes. • Highly noise-sensitive uses. • Storage of highly flammable materials. • Hazards to flight.	• Locate structures maximum distance from extended runway centerline. • Minimum NLR of 25 dBA in residential and office buildings. • Dedication of avigation easement.	• Aircraft tie down apron. • Pastures, field crops, vineyards. • Automobile parking. • Any agricultural use except ones attracting bird flocks. • Warehousing, truck terminals. • Single-story offices.	• Suburban residential subdivisions. • Intensive retail uses. • Intensive manufacturing or food processing uses. • Two-story offices. • Hotels and motels.
D	• Hazards to flight.	• Deed notice required for residential development.	• All except ones hazardous to flight.	• Land uses with bright lights or bird attractions and uses that create smoke or dust.

NOTES: NRL = noise level reduction; i.e., the attenuation of sound level from outside to inside provided by the structure.
SOURCE: Madera County, 1993.

Federal Aviation Administration Regulations

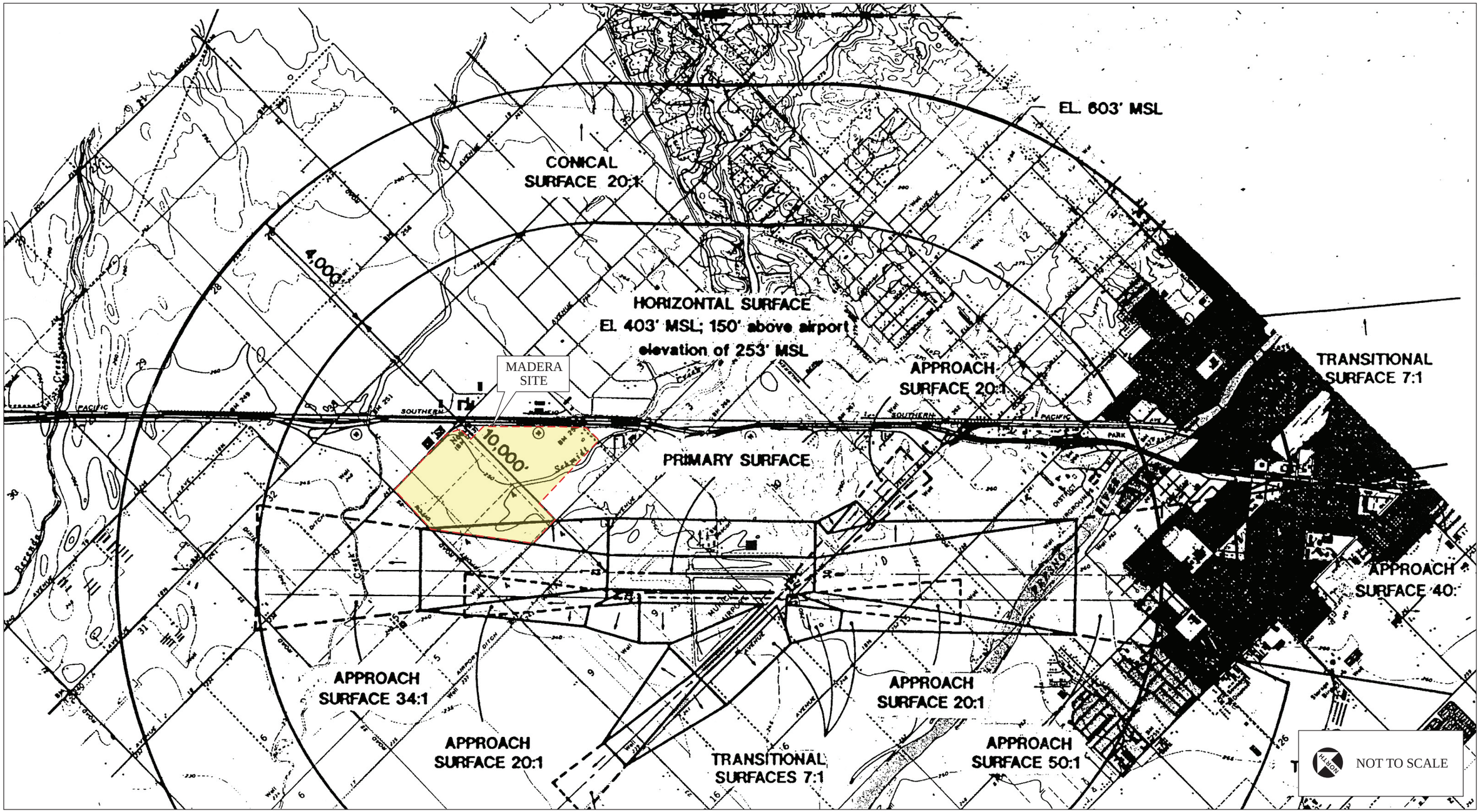
The Federal Aviation Administration (FAA) regulates height restrictions surrounding the Madera Municipal Airport. The Federal Aviation Regulations (FAR) Part 77, addresses objects affecting navigable airspace (FAA, 2005). FAR Part 77 defines "surfaces" above the ground that represent height restrictions for objects, including buildings, trees, heavy poles, signs, etc. Surfaces surrounding the airport are represented in **Figure 3.8-13**. The southernmost portion of the Madera site is within the transitional surfaces zone. The rest of the Madera site is within the horizontal surface zone. The surface heights are defined in those areas as:

- *Transitional surface.* These surfaces extend outward and upward at right angles to the runway centerline and the runway centerline extended at a slope of 7 to 1 from the sides of the primary surface and from the sides of the approach surfaces. They extend until they reach the height of the horizontal surface.
- *Horizontal surface.* A horizontal plane 150 feet above the established airport elevation.



SOURCE: City of Madera; AES, 2006

Figure 3.8-12
Madera County Municipal Airport Compatibility Zones



SOURCE: City of Madera; AES, 2006

Figure 3.8-13
Madera Municipal Airport Height Restriction Zones

The FAA also has several requirements for notifying the FAA if construction of an object may affect the navigable airspace (FAA, 2000). Notice is required if the object is:

> Near a Public-Use or Military Airport, Heliport, or Seaplane Base, where the proposed project would be within 20,000 feet of an airport with at least one runway more than 3,200 feet in length and the object would exceed a slope of 100:1 horizontally from the nearest point of the nearest runway.

In addition to permanent structures, the FAA requires notification of temporary structures or equipment, such as a crane, if the object exceeds the 100:1 horizontal slope requirement.

NORTH FORK SITE

The North Fork site is located within four miles of the community of North Fork, which has a population of approximately 3,600 residents. North Fork is located in the Sierra Nevada Mountains adjacent to the Sierra National Forest, about 30 miles south of Yosemite National Park, and 50 miles north of Fresno. The North Fork site is located on land that is currently held in individual trust by the BIA. Individual trust allotments are held on land to the north of the North Fork site. Current land use at the North Fork site, which has three residences, is rural residential. Land uses surrounding the North Fork site are also rural residential.

General Plan and Zoning

Because the North Fork site is located on land that is currently held in trust by the BIA, it is not subject to local land use jurisdiction. The general plan and zoning for Madera County are not applicable to land that is held in trust by Federal agencies. The North Fork site is not within the range of influence of the Madera Municipal Airport or any other airport.

3.8.3 AGRICULTURE

The United States Department of Agriculture performs a state-by-state census of agriculture every five years. The National Agriculture Statistical Service (NASS) collects census data from a list of all known potential agriculture operators. The census reports on various statistics relating to crop yields, farm acreage, and farm economics. Selected census of agriculture data for Madera County from the past three census years is shown in **Table 3.8-12**. According to the most recent census, 682,468 acres (or 50%) of the total 1,374,160 acres in Madera County were used for farming purposes (USDA, 2005). Farmland in Madera County accounts for 2.5% of the total farmland within the State of California.

The Madera County Department of Agriculture publishes the annual crop report that includes data on that year's crop yields and the progress of any County pest management programs.

TABLE 3.8-12
CENSUS OF AGRICULTURE STATISTICS FOR MADERA COUNTY

Category	1992 Census	1997 Census	2002 Census
Farms	1709	1673	1780
Land in farms	749,465	641,546	682,468
Farm acreage (percentage of total County acreage)	55%	47%	50%
Average size of farm	439	383	383

SOURCE: USDA, 2005; AES, 2006.

According to the *2003 Agricultural Crop Report*, Madera County's gross production value in 2003 was $760,784,000, which was a decrease of 2.4% from the 2002 production value (Madera County, 2003). The report also indicated that field crop production decreased slightly for most commodities, such as cotton, corn, oats, wheat, rice, barley, sugar beets, dry edible beans, and all hay. Wheat production experienced the greatest decline due to wheat stripe rust affecting more than two thirds of the County wheat acreage. Almonds became the number one crop in Madera County in 2003, due to continuing increases in acreage and a 42% increase in production value. Grape values were also increasing slightly although not enough to offset decreased harvested acreage and yield per acre. Variable temperatures harmed pistachio pollination, resulting in a 70% decrease in yield. Apples, olives, and many fruits increased in yield when less productive orchards were taken out of production. Dairy herd numbers increased and market milk production increased by over 14% during 2003. Nursery production acreage increased 58% in 2003, with an accompanying increase in production value of nearly $2.4 million. In contrast, vegetable crop production values decreased over $7 million (Madera County, 2003). The top ten crops for 2002 and 2003 are shown in **Table 3.8-13**.

TABLE 3.8-13
TOP TEN CROPS IN MADERA COUNTY

2002		2003	
Crop	**Gross Production Value**	**Crop**	**Gross Production Value**
Grapes	$155,043,000	Almonds	$163,038,000
Almonds	$115,148,000	Grapes	$148,260,000
Milk	$108,843,000	Milk	$128,973,000
Pistachios	$93,798,000	Heifers	$47,025,000
Heifers	$43,750,000	Pistachios	$31,891,000
Alfalfa	$32,650,000	Alfalfa	$31,374,000
Cattle and Calves	$24,225,000	Cattle and Calves	$29,185,000

Poultry	$23,801,000	Poultry	$22,125,000
Nursery Stock	$18,271,000	Cotton	$21,771,000
Cotton	$21,771,000	Nursery Stock	$20,660,000
Total	**$637,300,000**	**Total**	**$644,302,000**

SOURCE: Madera County, 2004; AES, 2006.

Farmland Protection Policy Act

The Farmland Protection Policy Act (FPPA) (7 U.S.C. § 4201) is intended to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland to non-agricultural uses. It assures that Federal programs are compatible with state, local, and private programs and policies to protect farmland (NRCS, 2004).

The Natural Resource Conservation Service (NRCS) is responsible for the implementation of the FPPA and 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 designated farmlands must also have been in production four years prior to the categorization by the NRCS.

Consultation with the NRCS has shown that the Madera site contains prime farmland, unique farmland, and farmland of statewide and local importance (**Appendix Q**). The NRCS uses the California Storie Index to evaluate the land for crop suitability, as detailed in **Table 3.8-14**.

TABLE 3.8-14
STORIE INDEX RATING

Grade	Index Rating	Description
1	80-100	Few limitations that restrict their use for crops.
2	60-80	Suitable for most crops, but have minor limitations that narrow the choice of crops and have a few special management needs.
3	40-60	Suited to a few crops or to special crops and require special management.
4	20-40	If used for crops, are severely limited and require special management.
5	10-20	Not suited for cultivated crops, but can be used for pasture and range.
6	Less than 10	Soil and land types generally not suited to farming.

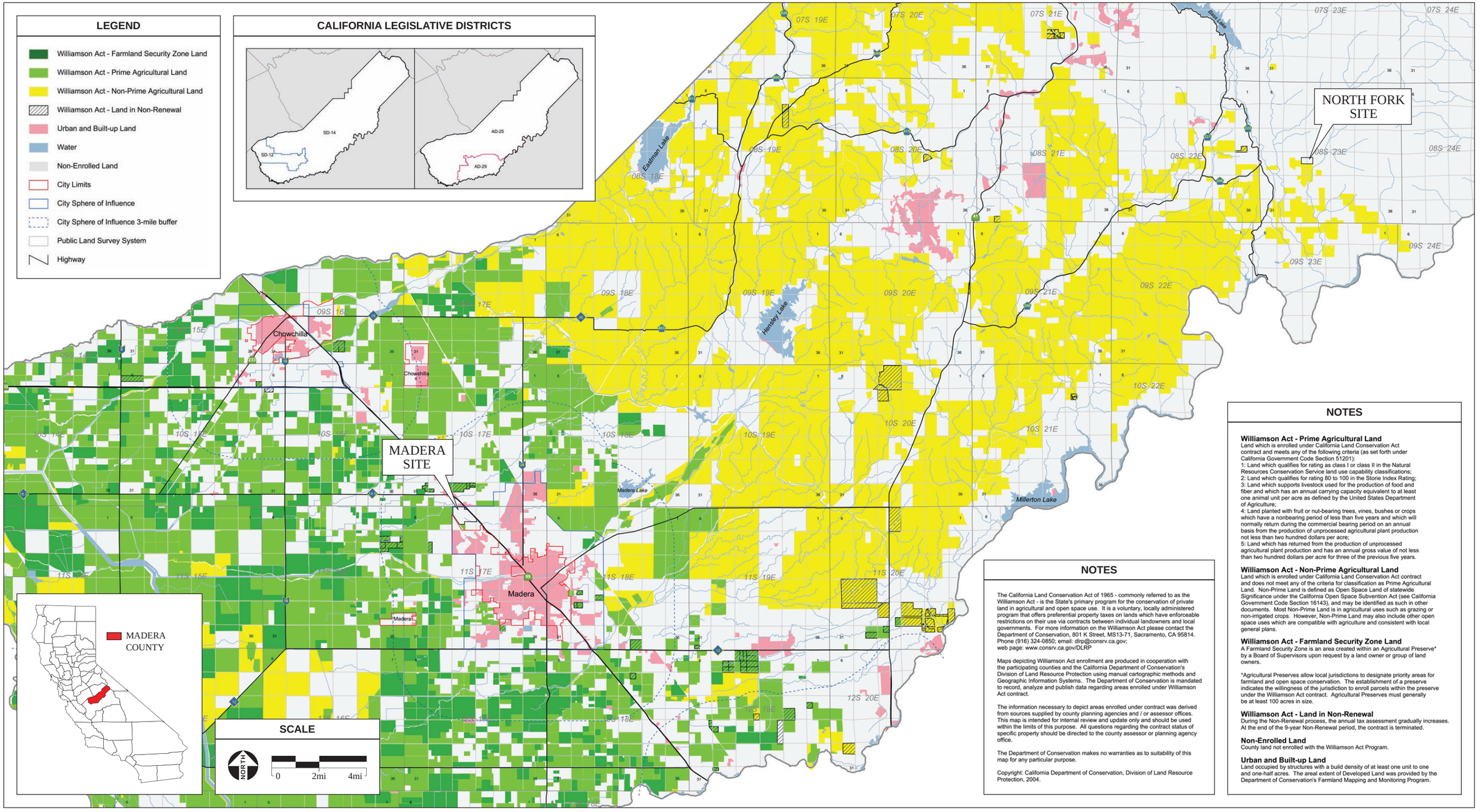
SOURCE: USDA, 2004; AES, 2004.

In some areas, land that does not meet the criteria for prime or unique farmland is considered to be farmland of statewide importance for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the State. Generally, the land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable. Farmland of statewide importance may include tracts of land that have been designated for agriculture by State law. As shown in **Figure 3.8-15**, the majority of the Madera site is made up of farmland of local importance. Farmland of local importance is defined as tracts of land that are not identified as having national (prime or unique farmland) or statewide importance, but which have nonetheless been identified by a local agency as important farmlands (7 C.F.R. § 657.5).

Williamson Act

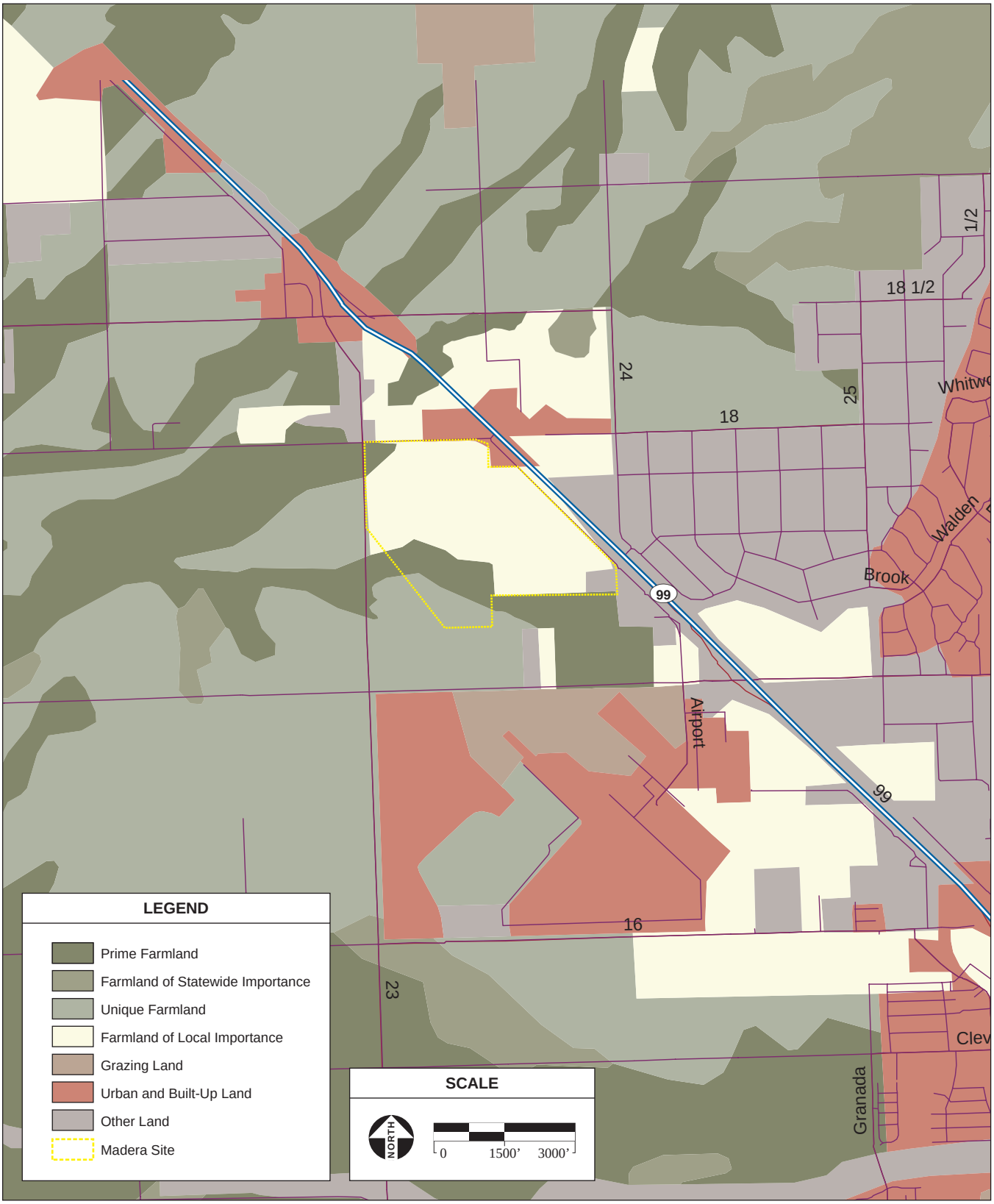
In addition to the NRCS categorization, the California Land Conservation Act of 1965, referred to as the Williamson Act (CGC § 51200 *et. seq*.), enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. In return, landowners receive property tax assessments which are much lower than normal because they are based upon farming and open space uses as opposed to full market value. Local governments receive an annual subvention of forgone property tax revenues from the State via the Open Space Subvention Act of 1971. A majority of land in Madera County is under Williamson Act contracts, as shown in **Figure 3.8-14**. Land subject to a Williamson Act contract is valued on a yearly basis according to its income-producing ability. Generally, the assessor values the land by taking the fair rental value, as well as the actual rent being paid (if any) on the subject land. The fair rental value is then divided by a specified capitalization rate. The capitalized value, which will serve as the land's value under the Williamson Act, is the result of this calculation.

The Williamson Act was amended in 1998 to include the Farmland Security Zone (FSZ) Act (CGC § 51200 *et. seq*.). The property must be in a Williamson Act contract in order to qualify as a FSZ. Under the provisions of the act, the landowner applies for FSZ status, and enters into a contract with the county, which annually renews twenty years into the future. The owner of the property promises not to develop the property into non-agricultural uses. In return, the FSZ contact is valued for assessment purposes at 65 percent of the value of its Williamson Act value, or its Proposition 13 value, whichever is lower. The terms of a Williamson Act contract are for a minimum of 10 years, whereas terms of the FSZ contract are for a minimum of 20 years. In September 2002, a group of adjacent landowners just outside of the City of Madera created a farmland security perimeter, which permanently protects 440 acres of farmland to the west of the



SOURCE: Madera County Williamson Act Lands, 2004; AES, 2006

Figure 3.8-14
Williamson Act and Farmland Security Zone Parcels



SOURCE: California Division of Land Resource Protection, 2002; AES, 2006

Figure 3.8-15
FMMP Map

city, shown as dark green areas in **Figure 3.8-14**. There are no Williamson Act or FSZ contracts on the Madera site or the North Fork site.

Farmland Mapping and Monitoring Program

The Farmland Mapping and Monitoring Program (FMMP) produces maps and statistical data used for analyzing impacts on California's agricultural resources. Agricultural land is rated according to soil quality and irrigation status and is usually based on information obtained from aerial photographs and from the NRCS. The FMMP map for the vicinity of the Madera site is shown in **Figure 3.8-15**.

Madera County Right to Farm Ordinance

In situations where nonagricultural land uses extend into agricultural areas, agricultural operations sometimes become the subject of nuisance complaints. Litigation sometimes results, leading to a curtailing of agricultural operations and investments in agricultural operations. In order to conserve, protect, and encourage the development, improvement, and viability of agricultural operations, Madera County passed a "right to farm" ordinance protecting existing agricultural operations from nuisance lawsuits (Ord. 522 § 2(part), 1989).

Current Use

For the last 10 years, the Madera site has been used for non-irrigated feed grain crops such as oat. Oat is a winter crop and is harvested in July/August. The land is fallow the remainder of the year. No crop was planted this year and the land is currently vacant (Shaw, pers. comm., 2005). The harvest is used as supplemental feed for private use and is not sold for profit.

The North Fork site is not currently used for agricultural activities. Because the North Fork site is trust land, it is not applicable for Williamson Act or FSZ contract.

3.8.4 OTHER RESOURCE USES

The Madera site is primarily used for agriculture. No hunting, fishing, hiking or other recreational uses exist at the Madera site. The nearest recreational use is the Madera Municipal Golf Course, located just south of the Madera site across Avenue 17.

The North Fork site is currently used for rural residences and for open space.

3.9 PUBLIC SERVICES

3.9.1 WATER SUPPLY

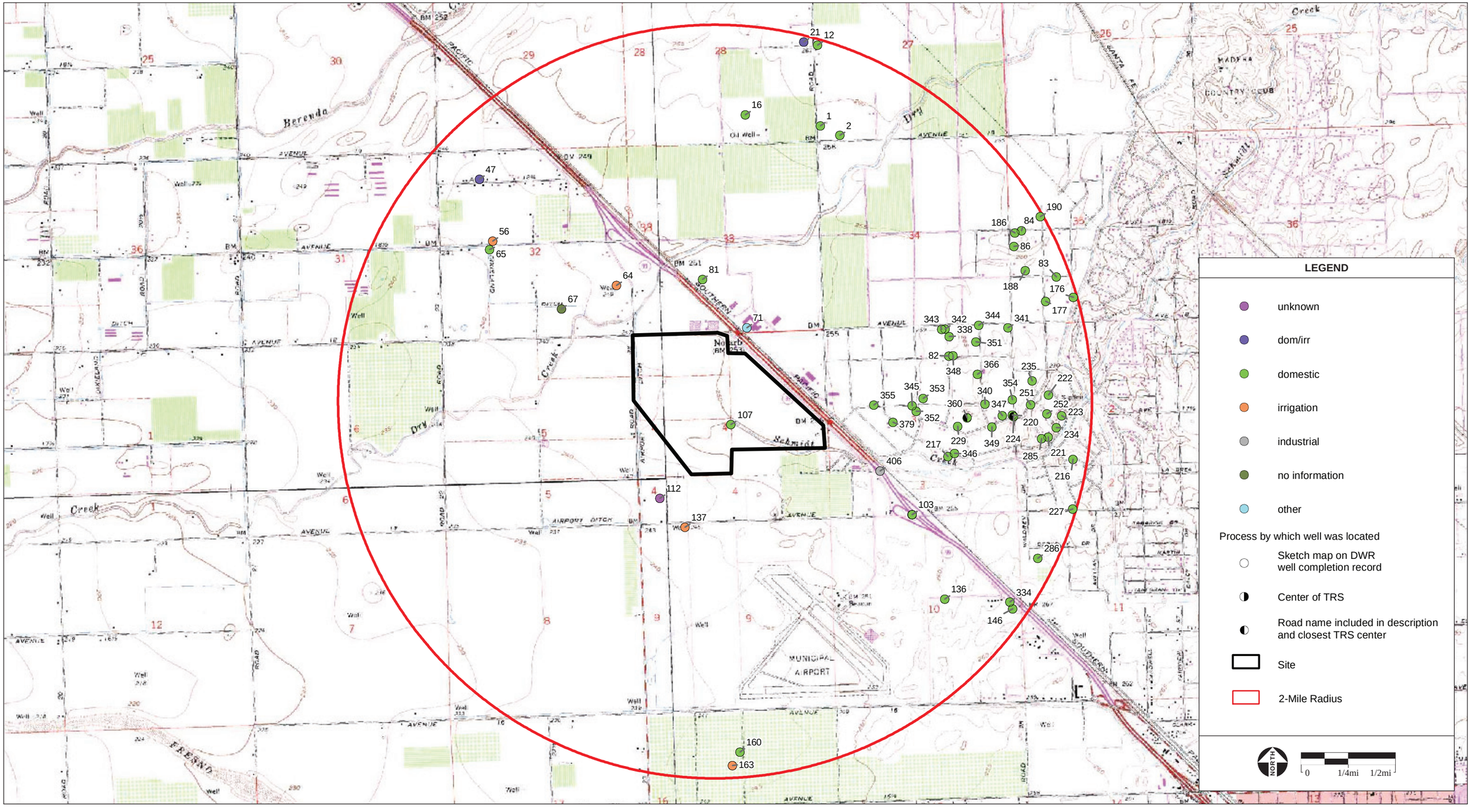
MADERA SITE

The City of Madera's water supply consists of 16 groundwater wells, a 1-million gallon water storage tower and water distribution pipelines. In addition to the public wells, a large number of residents utilize private wells for their water supply needs. Shallow wells within a two-mile radius of the Madera site are shown in **Figure 3.9-1** and deep wells within a two-mile radius are shown in **Figure 3.9-2**. Municipal Well #26 is located about a mile south of the Madera site at the intersection of Airport Drive and Aviation Drive (**Figure 3.9-2**). This well is approximately 600 feet deep and has a capacity of approximately 1,300 gallons per minute (gpm). Municipal Well #25 is located about 1.5 miles southeast of the Madera site. The well is approximately 500 feet deep and has a capacity of approximately 2,200 gpm. The Madera site has previously been used for agriculture and there is one active agricultural well on the Madera site. Groundwater quality is generally good but manganese levels tend to increase with depth north of the City (HydroScience Engineers, 2006).

In addition to municipal uses, Madera County requires irrigation water for intensive agricultural land uses. The Bureau of Reclamation created the Central Valley Project (CVP) in order to provide the semi-arid regions of California with water for irrigation and industrial uses. Madera County is part of the Friant Division of the CVP, which transports surplus northern California water through the southern part of the semiarid Central Valley. The division delivers water to over one million acres of irrigable farmland on the east side of the southern San Joaquin Valley, from approximately Chowchilla in the north, to the Tehachapi Mountains in the south. The main features of this division are Friant Dam, Friant-Kern Canal, and Madera Canal. The principal features of the Friant Unit begin with the San Joaquin River at Millerton Reservoir and Friant Dam located northeast of Fresno. Out of Millerton Reservoir, water is distributed to contracting irrigation and water districts and local cities by way of the Friant-Kern Canal to the south, and the Madera Canal to the north.

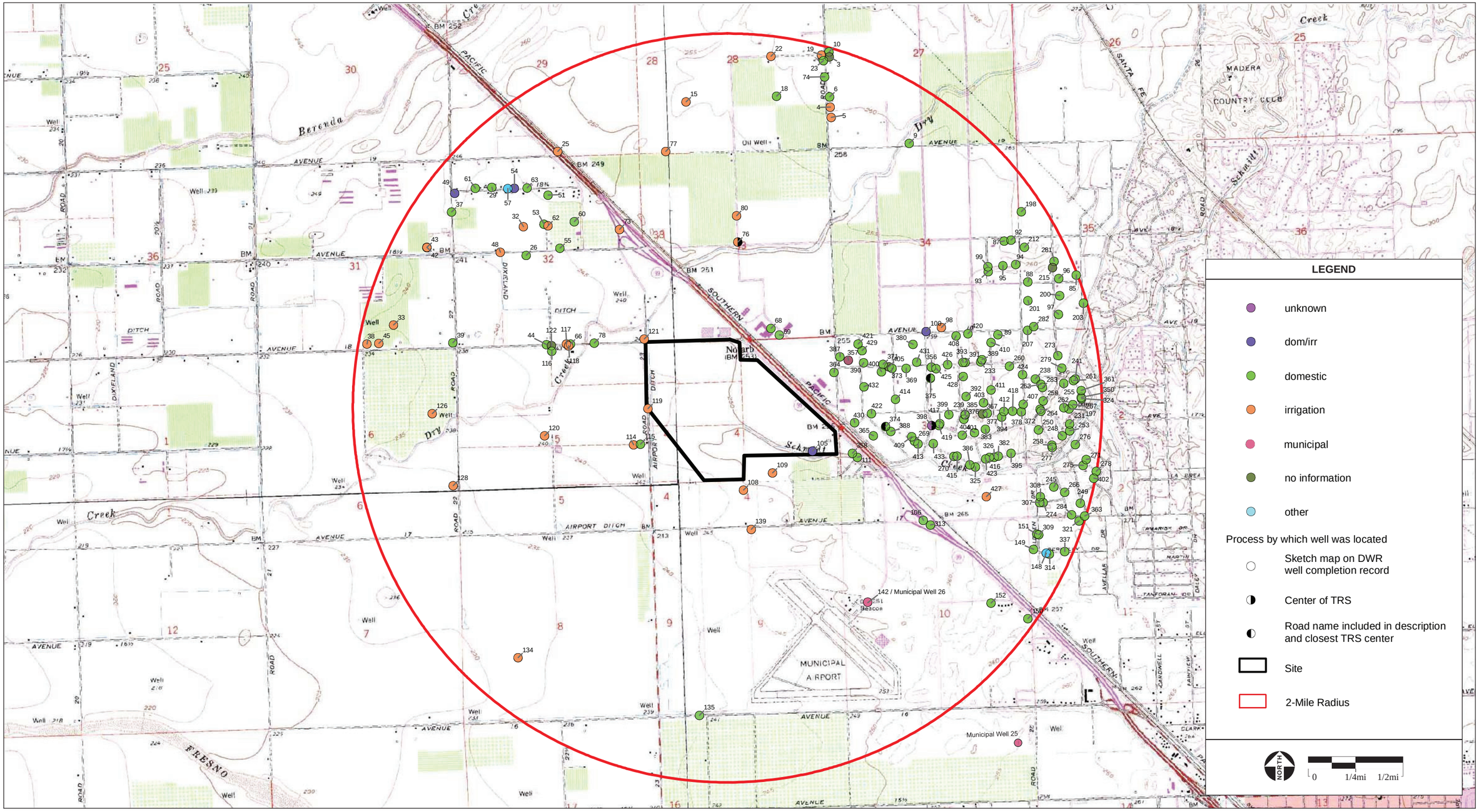
NORTH FORK SITE

Municipal water supply service has not been extended to the North Fork site. Water in the area is currently provided by three individual wells, one located at each residence. Wells within a one-mile radius are shown in **Figure 3.9-3**. Approximately 10 wells are not shown on the figure due to inadequate location information. A study by Madera County suggests that groundwater quantity in eastern Madera County is sufficient to meet current and some future development (County of Madera, 2002). Some wells throughout the County have elevated concentrations of total coliform bacteria, gross alpha/uranium, arsenic, iron, and manganese. Due to increased



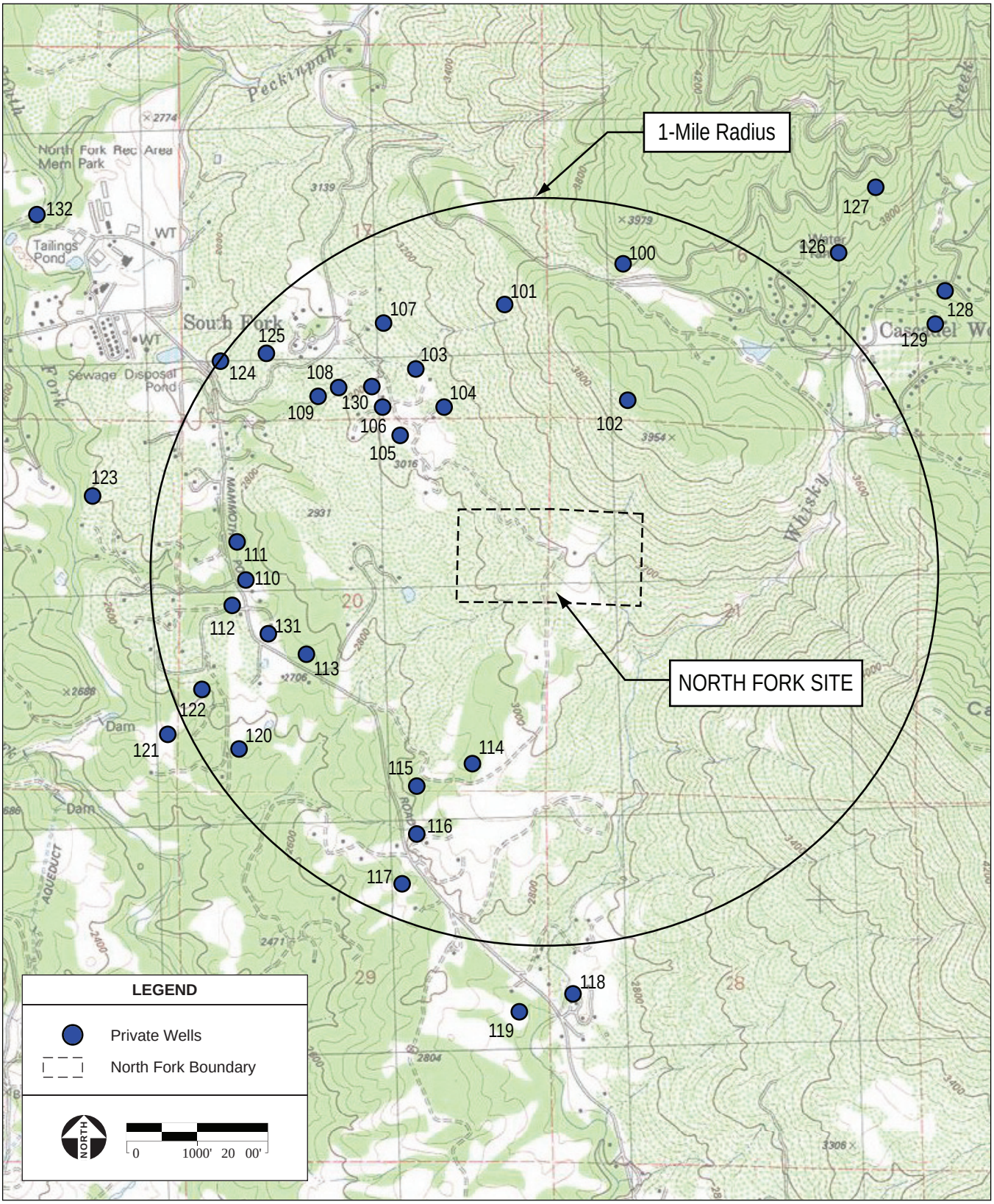
SOURCE: Worley Parsons Komex, 9/06; "Berenda, CA" & "Kismet, CA" USGS 7.5 Minute Topographic Quadrangles, Sections 32 & 33, T10S, R17E and Section 4, T11S, R17E, Mt. Diablo Baseline and Meridian; AES, 2006

Figure 3.9-1
Location of Shallow Wells - Madera Site and Vicinity



SOURCE: Worley Parsons Komex, 9/06; "Berenda, CA" & "Kismet, CA" USGS 7.5 Minute Topographic Quadrangles, Sections 32 & 33, T10S, R17E and Section 4, T11S, R17E, Mt. Diablo Baseline and Meridian; AES, 2006

Figure 3.9-2
Location of Deep Wells - Madera Site and Vicinity



SOURCE: "Cascadel, CA" USGS 7.5 Minute Topographic Quadrangle,
Sections 20 & 21, T8S, R23E Mt. Diablo Baseline and Meridian; AES, 2006

Figure 3.9-3
Well Locations – North Fork Site and Vicinity

levels of uranium and arsenic, some wells supply only non-potable demands (HydroScience Engineers, 2006).

The nearest municipal system is the Madera County Maintenance District 8A, which serves water to the town of North Fork. The District has 49 residential connections, 9 commercial connections with 27.56 equivalent dwelling units (EDUs), and 22 standby connections. The District will serve approximately 200 homes and services upon final build-out. The system receives water from one well, which is 520 feet deep. Water is pumped at 240 gpm into a 200,000 gallon storage tank (Madera County, 2005). There is also one inactive well available for future use. The nearest connection point is located at the intersection of Road 225 and Road 274. Water shortages have not been an issue for this District (County of Madera, 2002).

3.9.2 WASTEWATER SERVICE

MADERA SITE

Currently there are no wastewater treatment facilities located on the Madera site. The Madera Wastewater Treatment Plant, located at 13048 Road 21½, approximately 5 miles southwest of the Madera site in the City of Madera, is the regional facility for disposal of wastewater. The trickling filter treatment plant handles wastewater and sewage from approximately 10,000 residential, commercial and industrial customers in the City. The treatment plant has a maximum capacity of 7.0 MGD (million gallons per day), with a peak demand of 5.5 MGD and an average daily demand of 1.5 MGD. The treatment plant will be expanded in the near future to a maximum capacity of 10.1 MGD. During the expansion, the trickling filter system will be replaced with an activated sludge system. The City of Madera maintains approximately 140 miles of sanitary sewer mains in a system that includes five sewer lift pump stations and main pipelines ranging in size from 6 inches to 48 inches. A 10-inch sewer main is located at the junction of Avenue 17 and Airport Drive, 0.25 miles southeast of the Madera site.

NORTH FORK SITE

Currently there are no wastewater treatment facilities located on the North Fork site. Residential units currently utilize individual septic systems. The nearest treatment plant is located approximately 2 miles northwest of the North Fork site near the intersection of Road 225 and Road 228 in North Fork. It is an extended aeration treatment plant operated by the County and designed to treat 31,000 gallons per day (gpd). Treated effluent is disposed of in spray fields. Currently there are 99 service connections and 22 standby connections and the treatment plant is near maximum capacity. Improvement plans include expanding treatment facilities to treat 60,000 gpd and adding leachfields for disposal.

3.9.3 SOLID WASTE SERVICE

CALIFORNIA INTEGRATED WASTE MANAGEMENT ACT

The management of non-hazardous solid waste in Madera County is mandated by State law and guided by policies at the State and local levels. In 1989, the State of California enacted Assembly Bill (AB) 939, the California Integrated Waste Management Act. The purpose of AB 939 is to:

- Reduce, recycle, and reuse solid waste generated in the State to the maximum extent feasible,
- Improve regulation of existing solid waste landfills,
- Ensure that new solid waste landfills are environmentally sound,
- Streamline permitting procedures for solid waste management facilities, and
- Specify the responsibilities of local governments to develop and implement integrated waste management programs.

As a result of AB 939, all local jurisdictions, cities, and counties are required to divert 50% of the total waste stream from landfill disposal by the year 2000. Each local jurisdiction would demonstrate compliance by instituting source reduction programs. Fines up to $10,000 a day can be issued for non-compliance. Jurisdictions that did not meet the 50% diversion requirement in 2000 were allowed to petition the California Integrated Waste Management Board (CIWMB) for time extension lasting a maximum of five years. The disposal capacity component of AB 939 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.

MADERA SITE

The City of Madera Solid Waste and Recycling Division provides residents and business owners with the appropriately sized trash receptacle. Brown-Ferris Industries (BFI), the City's contract waste hauler, collects and transports solid waste to the landfill for disposal. Madera County's solid waste disposal needs are provided for at the Fairmead Sanitary Landfill. The landfill is located on approximately 160 acres west of Highway 99 at Avenue 22 and Road 19½, approximately 8.5 miles north of the Madera site. The landfill consists of the old portion of the landfill (46 acres), the new expansion area (100+ acres) and a Materials Recovery Facility (MRF). The MRF is a picking and sorting line where recyclables are recovered and sold. The landfill is permitted up to 1,100 tons per day and has an estimated closure date of 2032. The landfill actually receives 600 tons per day and received 141,300 tons in 2004 (Jones, pers. comm., 2005). Permitted waste types for the landfill include agricultural, mixed municipal, sludge (biosolids), tires, green materials, construction/demolition, and industrial waste. The MRF was constructed in the year 2000 as part of efforts to comply with AB 939. The City of Madera met

the 50% landfill diversion goal in 1999. Unincorporated County diversion rates do not meet the AB 939 requirement and received goal extensions based on biennial review (CIWMB, 2005).

NORTH FORK SITE

Residential and business solid waste collection services are provided by EMADCO Disposal, located in Oakhurst, which serves the Eastern Madera County area. The North Fork Transfer Station is located at 33699 Road 274 near the Town of North Fork, approximately 4 miles to the west of the North Fork site. The transfer station is located on 10 acres and is permitted to receive up to 60 tons per day. Solid waste from the area is collected and routed through the transfer station to the Fairmead Sanitary Landfill for disposal, approximately 50 miles to the southwest of the transfer station. As stated above, the County did not meet the diversion rate requirement of 50% and has received extensions.

3.9.4 ELECTRIC, NATURAL GAS AND TELECOMMUNICATION SERVICES

MADERA SITE

Pacific Gas and Electric Company (PG&E) supplies electricity and natural gas services to the project vicinity. Existing 12 kilovolt (kV) overhead electric facilities extend east/west along Avenue 17, adjacent to the Madera site. Additionally, distribution pressure gas lines are located 0.5 miles to the south of the Madera site at Falcon Drive. The distribution lines are stepped down from the transmission gas facilities that extend north/south between Golden State Boulevard and Highway 99, located adjacent to the Madera site (Barrow, pers comm., 2005).

SBC provides telecommunication service to residents and businesses in the San Joaquin Valley. SBC has facilities located along Avenue 18 on the south side of the street and Road 23 on the east side of the street. There are no capacity issues with regards to phone lines in this area. SBC also has a cable along Golden State Boulevard north of Avenue 17.

NORTH FORK SITE

PG&E is the company that provides electricity service in the vicinity of the North Fork site. The nearest electrical line is an overhead 12 kV line near Road 225 and Rainbow Road, approximately 0.5 miles southwest of the North Fork site. There are no natural gas facilities within the area.

The Ponderosa Telephone Company serves the mountain areas surrounding the North Fork site. Copper cable extends along Rainbow Road and Mission Road, adjacent to the North Fork site, which has the capacity to serve 50 phone lines or "pairs".

3.9.5 PUBLIC HEALTH AND SAFETY

FIRE PROTECTION SERVICES

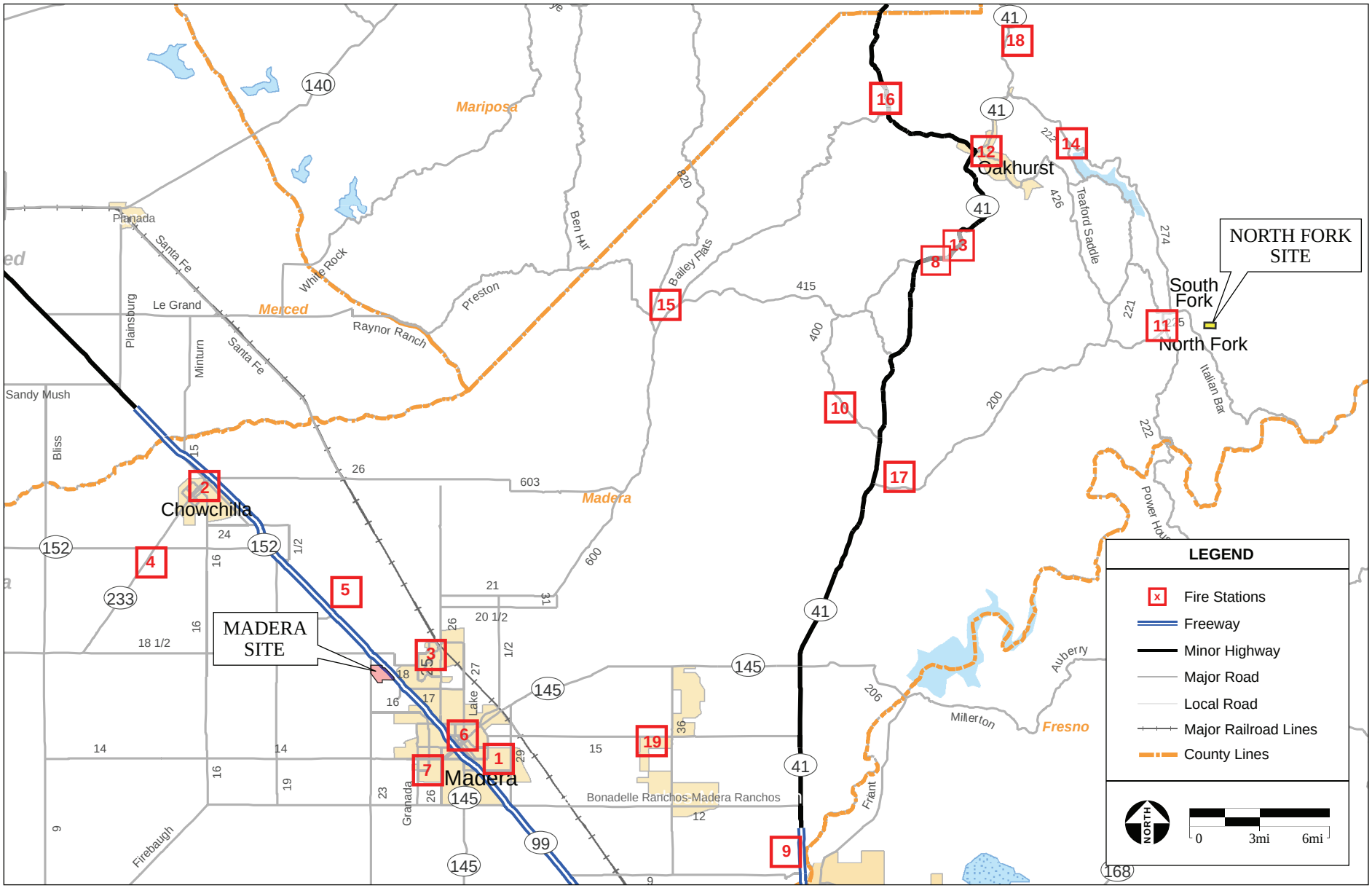
Madera Site

The Madera County Fire Department serves Madera County with the exception of the City of Madera, City of Chowchilla, Central California Women's Facility (Department of Corrections), and Yosemite National Park. These areas have mutual aid agreements with the Department. Both the Madera County and City of Madera Fire Departments are administered and staffed by the California Department of Forestry and Fire Protection (CDF), through separate contracts. The Madera County Board of Supervisors is responsible for governing the County Fire Department. Funding for the County Department is provided through the County General Fund (Helm, pers. comm., 2005). **Table 3.9-1** shows the location, staffing, and equipment for fire stations in the vicinity of the Madera site. All stations are operated by the County Fire Department with the exception of Stations 6 and 7, operated by the City of Madera Fire Department. **Figure 3.9-4** shows the locations of fire stations in the vicinity of the Madera site.

The staffing goals for County Fire Department are a 2 staff (minimum) for all career-staffed stations. The County Department responded to 8,100 emergency calls in 2003, 70% of which were for medical aid. The County Department does not provide ambulatory services. The 30% of the remaining calls were fire-related emergencies. The majority of those incidents are vegetation fires, followed by structure fires and vehicle fires. Other incidents include hazardous material responses, public service assists and false alarms. Response times vary greatly throughout the County of Madera. Some areas can be greater than 30 minutes while others run 3 to 5 minutes. Desired response time (from time of call to arrival at the scene) is less than 5 minutes for heavy urban, 5 to 8 minutes for urban and 10 to 15 minutes for rural.

Madera County Fire Station #3, located approximately 4.6 miles from the Madera site at 25950 Avenue 18½ in Madera, currently serves the Madera site. The response time to the Madera site from Station 3 is approximately 6.5 minutes (Helm, pers. comm., 2005). The County Department is currently planning several new fire facilities in the near future within Madera County along the Highway 41 corridor.

The City of Madera Fire Department serves areas in the City of Madera and in the City's sphere of influence. As the Madera site is within the City's sphere of influence, it is possible that the City Fire Department would serve the site, although it would primarily be served by County Station #3. Staffing and equipment for the City fire stations, Stations 6 and 7, are listed in **Table 3.9-1**. The response time from the City Fire Department to the Madera site is 8-10 minutes (Hartsuyker, pers. comm, 2005).



SOURCE: ESRI Data, 2004; AES, 2006

Figure 3.9-4
Fire Station Locations

TABLE 3.9-1
STAFFING LEVELS OF FIRE STATIONS

Station	Address	Paid Staff	Volunteer Staff	Apparatus[1]
1 – Madera	14225 Road 28, Madera	1	20	2 Engines
2 – Chowchilla	112 Trinity Street, Chowchilla	0	7	1 Engine
3 – Madera Acres	25950 Avenue 18½, Madera	1	17	1 Engine, 1 Water Tender
4 -- Dairyland	13802 Avenue 21, Chowchilla	0	10	1 Engine, 1 Water Tender
5 – Central CA Women's Facility	23370 Road 22, Chowchilla	--	--	--
6 – Madera City[2]	317 North Lake, Madera	3	0	1 Engine
7 – Madera Ctiy[2]	200 South Schnoor, Madera	2	0	1 Aerial Apparatus
8 – Chukchansi Casino	34555 Highway 41, Coarsegold	2	0	1 Aerial Apparatus, 1 Light Engine
9 – Rolling Hills	41016 Avenue 11, Madera	1	7	1 Engine
10 – Yosemite Lakes	29453 Glacier Drive, Coarsegold	0	18	2 Engines, 1 Squad
11 – North Fork	32908 Road 222, North Fork	0	13	1 Engine, 1 Squad, 1 Water Tender
12 – Oakhurst	49015 Civic Circle Drive, Oakhurst	1	9	2 Engines, 1 Squad
13 – Coarsegold	35600 Highway 41, Coarsegold	0	5	1 Engine, 1 Water Tender
14 – Bass Lake	40601 Road 274, Bass Lake	0	10	1 Engine, 1 Squad, 1 Water Tender
15 – Raymond	36896 Road 600, Raymond	0	6	1 Engine
16 – Ahwahnee	42308 Highway 49, Ahwahnee	0	9	1 Engine, 1 Squad, 1 Water Tender
17 – O'Neals	Road 201 and Road 200, O'Neals	0	3	1 Engine
18 – Cedar Valley	44907 Lakeside Drive, Oakhurst	0	4	1 Engine, 1 Squad, 1 Water Tender
19 -- Bonadelle	35141 Bonadelle Avenue, Madera	1	26	2 Engines, 1 Squad, 1 Water Tender

NOTES: [1] A water tender carries approximately 4,000 gallons of water to provide a mobile water source that will supply the fire engines. A squad is a small truck with no pump, water, hose or ladders that carries rescue and EMS supplies. An aerial apparatus carries a hydraulically operated and permanently affixed extending ladder that generally range form 55 feet to 110 feet in vertical reach. In addition to providing an aerial ladder, it may also provide for an elevated fire stream. Aerial apparatus may or may not have a pump and carry water.
[2] Stations operated by City of Madera Fire Department.
SOURCE: Madera County Fire Department, 2005.

North Fork Site

The Madera County Fire Department provides service to the North Fork site. **Table 3.9-1** shows locations, staffing, and equipment information for the Madera County Fire Department. **Figure 3.9-4** shows the location of stations in the vicinity of the North Fork site. The nearest station is Station #11 located at 32908 Road 222 in North Fork, approximately 4 miles west of the site. The expected response time to the site is approximately 10 to 15 minutes (Helm, pers. comm., 2005). Several new facilities are planned along the Highway 41 corridor.

LAW ENFORCEMENT SERVICES

Madera Site

The County of Madera Sheriff's Department currently provides public safety services to the Madera site. The Department is funded by appropriations from the County General Fund. Dedicated third party funds from State and federal grant programs pay for some law enforcement expenses. The elected Sheriff of Madera County is the administrative authority. The Department

is divided into two geographic sections, the Valley and the Mountains. Each section is commanded by a lieutenant and is almost self-sufficient. The Department provides law enforcement within the Madera County lines. Municipal police departments provide primary law enforcement within the jurisdictional boundaries of Madera and Chowchilla. The Sheriff's Department employs 116 people, of whom 82 are sworn officers. The department headquarters, located at 14143 Road 28 in the City of Madera, is the primary dispatch point for patrol services from the Valley Division. As currently configured, area services are provided from the Headquarters station. The Headquarters Station is approximately 6 miles southeast of the Madera site (Outfleet, pers. comm., 2004). **Figure 3.9-5** shows the location of police stations in the vicinity of the Madera site.

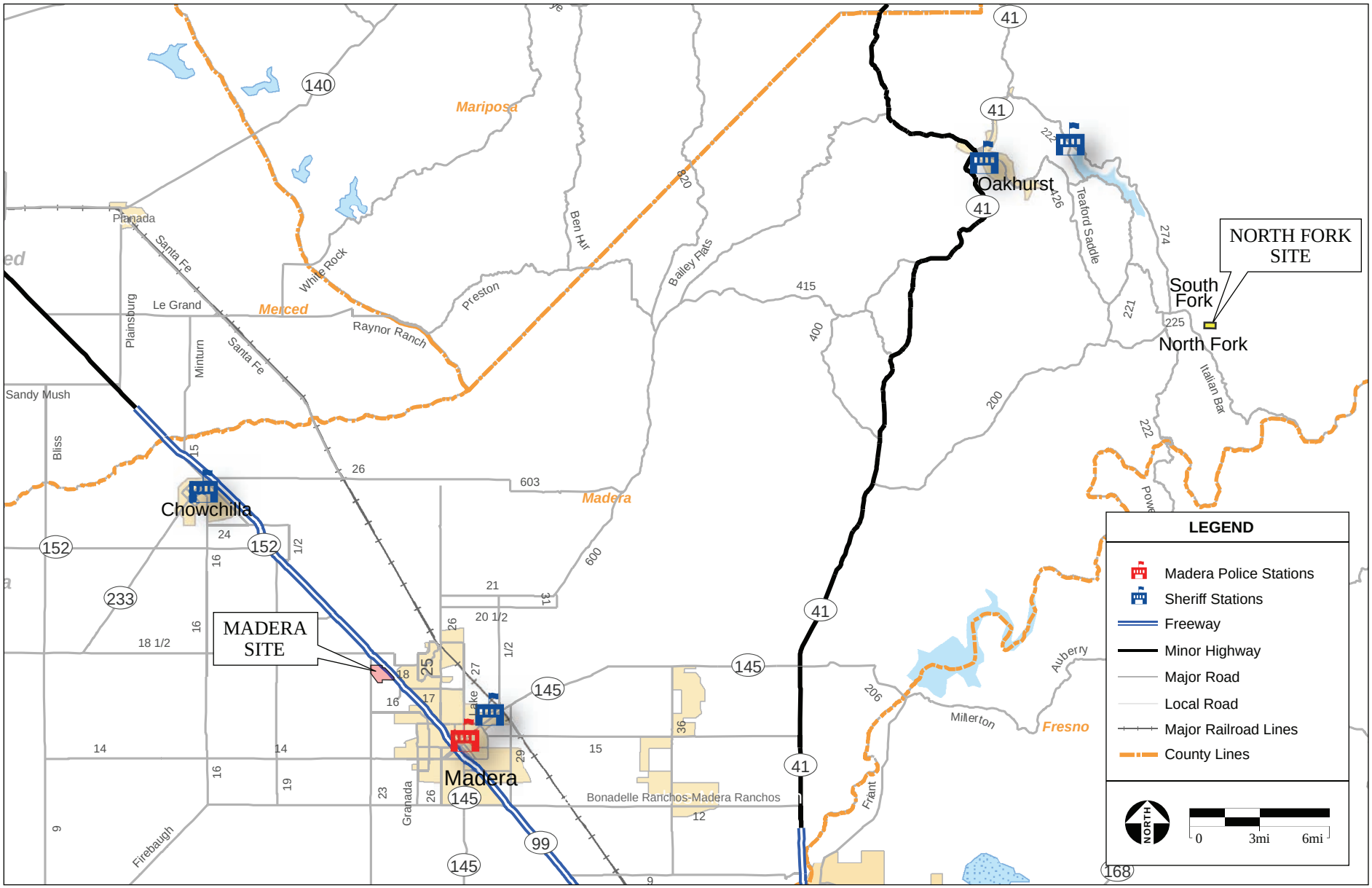
The Headquarters Station houses 24 Deputy Sheriffs and their requisite equipment. The station also has 4 detectives, 2 lieutenants, an Undersheriff and a Sheriff available to respond to calls for service. The department has 4 authorized law enforcement positions that are currently unstaffed; clerical and dispatcher vacancies also exist. The Department seeks to attain the suggested US Department of Justice Federal standard of 1.2 law enforcement officers for every 1,000 persons. Within Madera County, the Board of Supervisors determines the actual service level, which is currently 0.8 law enforcement officers per 1,000 persons. Actual response time for emergency and non-emergency calls is not a maintained statistic within the department, the desired response time for the department is 15 minutes. Calls are dispatched with priority given to threats to life or health (Outfleet, pers. comm., 2004). **Table 3.9-2** provides a summary of Sheriff-Coroner services in 2003.

TABLE 3.9-2
MADERA SHERIFF-CORONER SUMMARY OF SERVICES RENDERED IN 2003

Service	Number of Cases
Requests for service	37,387
Case files opened	6,567
Major crimes reported	2,071
All arrests	1,366
Felony arrests	595
Misdemeanor arrests	745
Coroner cases reported	491

SOURCE: Madera County Sheriff's Department, 2004.

Although unincorporated areas of Madera County are rarely served by the City of Madera Police Department, it is located within the vicinity of the Madera site. The Department is funded by the City of Madera general fund. There is one station, located at 203 West 4th Street, as shown on **Figure 3.9-5**. There are 79 total staff, of which 54 are sworn officers. There are 4 authorized sworn positions which are currently vacant. The City Department has 15 patrol vehicles, 3 K-9



SOURCE: ESRI Data, 2004; AES, 2006

Figure 3.9-5
Police Station Locations

units, and a SWAT team, which is shared with the County. Patrols are run in 2 shifts with 5 officers and 1 supervisor per shift. There are 4 beats and the Madera site is closest to Beat #4. In 2004, there were 40,000 calls for service to the City of Madera Police Department (Frazier, pers. comm., 2005).

The judicial system and Department of Corrections are additional components of law enforcement in Madera County. The judicial system includes the District Attorney who prosecutes crimes, Public Defender who defends accused who are indigent, the court system that holds trials, and grand jury that indicts the accused. The County has one jail built to accommodate 316 inmates although the population often surpasses this level (**Appendix R**). In early 2005, the facility housed 364 inmates of which 50 were women. The facility tries to maintain an inmate population between 350 and 360. The Madera County Department of Corrections director believes that the County will consider a new facility when the average inmate population surpasses 395 persons. Prisoners in the facility are awaiting arraignment, held on warrants, or serving sentences of less than one year. Prisoners serving over one year are moved to state facilities (**Appendix R**).

North Fork Site

The County of Madera Sheriff provides public safety services to the North Fork site and the surrounding vicinity. The Oakhurst Substation is the closest station that would respond to calls from the North Fork site. The Oakhurst Substation is approximately 18 miles north of the North Fork site at 39884 Road 425B (**Figure 3.9-5**). There are 29 sworn officers and 3 non-sworn officers at this substation with 2 to 4 officers working per shift. The Substation covers mountain areas of the County 24 hours a day, 7 days a week. The Substation service area is divided into 5 sectors and the North Fork site is located in the North Fork sector. The Oakhurst Station responds to approximately 40% of County calls for service. The expected response time for the mountain areas, including the North Fork site, is within 30 minutes (Salvador, pers. comm., 2005).

Bass Lake Substation is approximately 13 miles to the north of the North Fork site at 40601 Road 274; however, this substation does not respond to calls for service and operates with only 5 sworn officers and 4 un-sworn staff members (Weak, pers. comm., 2005).

The North Fork site is served by the same judicial system and Department of Corrections as described for the Madera site.

EMERGENCY MEDICAL SERVICES

Madera Site

Pistoresi Ambulance Service operates ambulances in the cities of Madera and Chowchilla and provides emergency medical service to the unincorporated, valley areas of the County. Pistoresi has eight licensed ambulances and one operations support vehicle. Four paramedic units are staffed seven days a week 24 hours per day and one paramedic unit is staffed 12 hours per day Monday through Friday. Also, one basic life support ambulance that provides non-emergency transports is staffed Monday thru Friday from 9 a.m. to 6 p.m. The two remaining ambulances are reserve units (Pistoresi, pers. comm., 2005).

Pistoresi Ambulance responds to approximately 7,500 calls per year and is not required to have a mandated response time. Nonetheless, the services goal is to meet guidelines that have been established for Fresno County (Pistoresi, pers. comm., 2005). The Fresno County Fire Protection District emergency response standard is five minutes in commercial and residential areas near Fresno and Clovis and 20 minutes in rural areas.

Madera Community Hospital, located at 1250 East Almond Avenue, approximately 6.4 miles south of the Madera site, is the emergency facility that serves the City of Madera and vicinity.

North Fork Site

Sierra Ambulance provides paramedic ambulance service to communities in eastern Madera County, including portions of Yosemite National Park and the Sierra National Forest. The area of service includes over 1,000 square miles and a population of approximately 30,000. The company operates 3 paramedic ambulances stationed in Oakhurst, Coarsegold, and Bass Lake. Sierra Ambulance has a staff of approximately 25 persons including paramedics, EMT-1's, a field supervisor, and office staff. In 2004, Sierra Ambulance responded to over 2,800 calls for service (Sierra Ambulance, 2004). The nearest emergency rooms are St. Agnes Medical Center and Kaiser Permanente Fresno Medical Center in Fresno, California. St Agnes Medical Center is located at 1303 E Herndon Avenue, 42 miles southwest of the North Fork site. The Kaiser Permanente Fresno Medical Center is located at 7300 North Fresno Street, 40 miles southwest of the Madera site.

3.9.6 SCHOOL SERVICES

Public education services were provided to 27,821 students during the 2004-2005 school year in Madera County. The County operates 67 schools, which are divided into 11 districts.

MADERA SITE

The Madera site is located in the Madera Unified School District (MUSD), which includes 21 schools and serves over 17,000 students, from kindergarten through adult education. The MUSD

also has approximately 1,700 employees. **Table 3.9-3** shows information for the district from the 2003-2004 school year. The average class size is 27 students and the student-to-teacher ratio for the District is 20.8:1, compared to 20.4:1 for the County of Madera (California Department of Education, 2005).

In 2004, the Madera Unified School District had a student population of 17,511. The District is currently experiencing an increase of 500 students per year. Most of these students are in elementary school. To accommodate the current number of students, the elementary and middle schools operate on a year-round system where 4 groups of students stagger their attendance by going to school for 3 months and then having 1 month of vacation.

In response to growth, the MUSD has embarked on a $110 million capital development campaign. The money comes from a bond issue, the State, and the school board's capital development fund. The campaign will pay for a middle school, two elementary schools and the land for two additional elementary schools. In order to accommodate current growth, the District believes it must build four new elementary schools at a rate of one every other year. With the new space, the District hopes to be able to put the schools back on a traditional nine-month schedule instead of year-round.

The nearest school is Crossroads Christian School, which is approximately 2.5 miles east of the Madera site at 17755 Road 26 in Madera. There are 8 public and private schools located approximately 3.5 to 4 miles from the Madera site.

NORTH FORK SITE

The North Fork site is in the Chawanakee Unified School District. The District has 1,179 students attending 9 schools. There are 3 elementary schools, 2 high schools, 1 alternative school, and one community day school. Staff consists of approximately 70 full-time teachers and 94 classified employees (staff not required to hold teaching credentials). The average class size is 26.3 students and the student-to-teacher ratio for the District is 16.9:1, compared to 20.4:1 for the County of Madera (California Department of Education, 2005).

The nearest school is North Fork Elementary, which is located approximately 2 miles northwest of the North Fork site at 33087 Road 228 in North Fork.

TABLE 3.9-3
2003-2004 SCHOOL INFORMATION FOR MADERA UNIFIED SCHOOL DISTRICT

School (Grade span)	Number of Students	Percent of Fully Credentialed Teachers[1]	FTE[2] Admin.[3]	FTE Teachers[4]	Number of Classified Staff[5]	Pupil Teacher Ratio	Avg. Class Size	Number of Students Per Computer
Adams (John) Elementary	901	97.7	2	43	15	21.0	21.9	6.7
Alpha Elementary	881	97.9	2	45.5	34	19.4	22.0	5.6
Berenda Elementary	942	97.7	1	42.9	18	22.0	23.0	4.4
Dixieland Elementary	301	100.0	1	15	8	20.1	21.5	2.3
Eastin-Arcola Elementary	763	100.0	2	38	38	20.1	21.8	4.5
Furman (Duane E.) High	281	100.0	0	10.8	3	26.0	25.5	5.7
Howard Elementary	499	95.5	1	22	16	22.7	25.0	4.5
Jefferson (Thomas) Middle	1,004	100.0	3	45	45	22.3	29.1	3.9
King (Martin Luther, Jr.) Middle	1,046	96.0	3	48.4	35	21.6	28.1	3.5
La Vina Elementary	305	100.0	1	17	16	17.9	20.3	2.6
Lincoln Elementary	906	100.0	2	44	13	20.6	22.6	4.7
Madera High	3,999	87.8	11	178.6	123	22.4	29.6	4.9
Madison Elementary	878	100.0	2.5	41.5	11	21.2	22.5	5.8
Millview Elementary	980	89.6	2	46.9	36	20.9	22.5	6.2
Monroe (James) Elementary	975	100.0	2	48.4	28	20.1	22.2	6
Mountain Vista High	248	75.0	1	12	7	20.7	22.3	3.9
Ripperdan Elementary	245	83.3	1	12	9	20.4	21.1	2.6
Sherman Thomas Charter	165	88.9	1	8.2	4	20.1	19.9	4.7
Sierra Vista elementary	983	100.0	2	46.7	27	21.0	23.4	4.1
Washington (George) Elementary	945	93.6	2	45.7	30	20.7	22.0	5.4
District total	**17,247**	**94.8**	**59.1**	**827.4**	**734**	**20.8**	**27.0**	**4.6**
County total	**27,188**	**95.0**	**129.9**	**1,330.1**	**1,434**	**20.4**	**26.3**	**4.9**
State total	**6,298,774**	**90.8**	**23,427.3**	**297,434.2**	**286,186**	**21.2**	**27.4**	**5**

NOTES: [1] Percent of teachers who hold a full credential.

[2] Percentage of time a staff member works represented as a decimal. A full-time person is 1.00, a half-time person is .50 and a quarter-time person is .25.

[3] Principals, assistant principals, program directors or coordinators, and other certificated staff not providing direct services to students.

[4] An employee of the school district who holds a position requiring certification and whose duties require direct instruction to the pupils in the school(s) of that district.

[5] An employee of a school district, in a position not requiring certification. The data are not collected in a manner that will allow full-time equivalent (FTE) reporting.

SOURCE: California Department of Education, 2005; AES, 2005.

3.10 OTHER VALUES

3.10.1 NOISE

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 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.

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
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}	Day-Night Average Sound Level. Similar to CNEL but with no evening weighting.
L_{eq}	Equivalent or energy-averaged sound level.
L_{max}	The highest root-mean-square (RMS) sound level measured over a given period of time.

SOURCE: Beranek, 1998.

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.

Existing Noise Environment

Madera Site

Existing traffic noise levels were evaluated using the Sound 2000 Prediction Model. Traffic volumes and speeds of 65 miles per hour along State Route 99 and 50 miles per hour along Golden State Boulevard were entered into the model to estimate noise levels at the proposed location for Alternatives A, B, and C. For Alternative D, traffic volumes and speeds of 35 miles per hour along Mission Drive were entered into the model.

To assess existing noise conditions, current traffic counts and existing geometric conditions data was compiled. Noise level measurements were taken on the Madera site on September 8, 2005. Measurements were conducted during peak hours and while aircraft from the Madera Municipal Airport were in the air. The purpose of the measurements was to evaluate the accuracy of the model in describing traffic noise exposure within the Madera site.

Noise monitoring equipment consisted of an Extech Type 2 sound level meter datalogger. Noise measurements were conducted in terms of the equivalent energy sound level (L_{eq}). Measured L_{eq} values were compared to L_{eq} values calculated (predicted) by the Sound 2000 model. Traffic volumes, truck mix and vehicle speeds were used as inputs to the model. Existing noise level measurements on the Madera site were between 53.2 dBA and 55.1 dBA, which are below the FHWA standards for exterior noise (**Appendix O**).

Madera Municipal Airport is located approximately 1.5 miles south of the Madera site. There are approximately 139 Aircraft operations per day. The airport accommodates business jet and turbojet type aircrafts (no commercial airlines) (AirNav, 2005). Typical approach and departure noise produced by business type aircrafts are presented in the noise study in **Appendix O**. Existing noise measurements were taken while an aircraft was in the air and it was noted that the noise meter would jump to approximately 58.0 to 60.0 dB. Based on the existing noise level analysis and typical aircraft noise pollution, the Madera Municipal Airport does not significantly effect the noise environment on the Madera site.

Adjacent to the north and south of the Madera site there are a few rural residential homes. The residential homes to the south of the Madera site are especially sensitive because a majority of the project traffic will travel north and south on Golden State Boulevard as the traffic flows to and from Avenue 17. Existing ambient noise levels at the nearest receptor were identified to be approximately 63.3 dBA, which is currently below the FHWA standards for exterior noise.

North Fork Site

The North Fork site is located within four miles of the community of North Fork, which has a population of approximately 3,600 area residents. North Fork is located in the Sierra Nevada Mountains adjacent to the Sierra National Forest, about 30 miles south of Yosemite National

Park, and 50 miles north of Fresno. The North Fork site is located on land that is currently in trust for the Tribe with individual trust land surrounding the North Fork site. Ambient noise sampling locations were limited to three on-site rural residential uses. Existing ambient noise levels in the vicinity of the North Fork site were measured to be approximately 39.5 dBA.

3.10.2 HAZARDOUS MATERIALS

INTRODUCTION

Hazardous materials are those materials that may pose a material risk to human health or the environment. These materials are subject to numerous laws and regulations at several levels of government. At the Federal level, human exposure to chemical agents, and in some cases environmental and wildlife exposure to such agents, is regulated primarily by four regulatory agencies: the EPA, the Food and Drug Administration (FDA), the Occupational Safety and Health Administration (OSHA), and the Consumer Product Safety Commission (CPSC). The CPSC plays a limited role in regulating hazardous substances; it deals primarily with the labeling of consumer products. The FDA also plays a limited role in regulating hazardous substances; it primarily regulates food additives and contaminants, human drugs, medical devices, and cosmetics. In addition to these regulatory agencies, the U.S. Department of Transportation (DOT) regulates the interstate transport of hazardous materials.

Analytical Environmental Services (AES) conducted Phase I Environmental Site Assessments (ESA) for the Madera and North Fork sites in May and September 2005 (**Appendix P**). An update of the Phase I for the Madera site was conducted by AES and the Bureau of Indian Affairs (BIA) in July 2007 (**Appendix P**). The purpose of the Phase I ESAs are to identify environmental conditions and hazardous materials involvement that may pose a material risk to human health or to the environment, or may in any way affect the proposed use of the Madera site. The ESAs were performed in conformance with the scope and limitations of the American Society for Testing and Materials (ASTM) Standard Practice E1527-00.

EXISTING CONDITIONS

Madera Site

The ESA included site visits to the Madera site on February 12, 2004, February 9 and 10, 2005, and July 12, 2007. Historically, the Madera site has been used for agriculture. Non-irrigated feed crops have been grown on the site for the past 10 years. There is a residence located on the southeast corner of the site; tenants occupied the residence during the 2005 site visit. Several barns and associated out buildings located adjacent to the residence were being used as storage. Items that were stored include agricultural and welding equipment, tractors, vehicles and a boat in the area adjacent to the residence. An empty 500-gallon diesel aboveground storage tank (AST) was present. There were two 55-gallon drums located in an area adjacent to a metal storage building. One of the drums was empty while the other contained used oil filters from farming

equipment and automobiles. Several agricultural wells with associated piping and electrical circuit boxes are located throughout the site. A majority of the circuit boxes did not appear functional and were in various forms of disrepair. There were several cattle feeders located in the southeastern portion of the site. Each feeder consisted of a cement foundation with metal chains for feeding collars. Inside one of the feeders was an uncontained yellow powder. The powder appeared to be elemental sulfur, which is used as a fungicide and as an insect repellant on cattle (**Appendix P**).

A representative from the BIA accompanied AES during the July 12, 2007 site visit. The conditions noted above did not change during the time between site visits with the exception of the following additional conditions. The residence was vacant during the 2007 site visit. Miscellaneous non-hazardous debris was noted in the barn, corral, and storage areas next to the residence including items such as farming equipment, household items (clothes, furniture), and various wood and metal debris. Additionally, several five-gallon buckets of waste oils, two 55-gallon drums, and several unmarked one-gallon containers of suspected paint or paint thinners were noted in one of the barns and corral area.

North Fork Site

The ESA included a site reconnaissance visit of the site and adjacent properties on February 15, 2005. There are three residential structures located on the North Fork site. One of the structures is comprised of wood framing with a concrete slab foundation; the second and third structure were mobile/modular homes. All residences were occupied at the time of the site reconnaissance visit. Water is supplied to the residences through individual wells. One of the residents reported that her water has an unpleasant taste and odor and that her family no longer consumes the water. A Tribal member not residing on the site reported that there is an oily sheen on the surface of the well water. Title 22 water quality testing was performed in 1998 and 2004; the testing did not check for total petroleum hydrocarbons such as gasoline (TPHg) and diesel (TPHd) or other constituents that would cause a sheen to be present on the surface of water. The ESA recommends collection of soil and ground water samples both up gradient and down gradient with respect to the anticipated groundwater flow direction on the site, is recommended prior to initiation of site development. The samples should be analyzed for the presence of TPHg, TPHd, and volatile organic constituents (VOCs).

PROJECT AREA DATABASE REPORT

Madera Site

A regulatory agency database report was performed to identify locations of past and current hazardous materials involvement. Regulatory agency databases were searched for records of known storage tank sites, known sites of hazardous materials generation, storage, or contamination, or violations pertaining to storage and use of hazardous materials. Databases

were searched for sites and listings up to two miles from a point roughly equivalent to the center of Madera site. The environmental database review was accomplished by using the services of a computerized search firm, *Environmental Data Resources, Inc.* (EDR). EDR uses a geographical information system to plot locations of past and/or current hazardous materials involvement. The EDR report was conducted in February 2005 and is included in the Phase I ESAs. A summary of the databases accessed by EDR is listed in **Table 3.10-3**. AES reviewed the database report to determine if any hazardous materials releases have occurred that would affect surface and subsurface conditions on the Madera site. The following paragraph summarizes the findings of the database report.

TABLE 3.10-3
DATABASES SEARCHED IN SITE ASSESSMENT

Database	Type of Record	Agency
NPL	National Priority List	USEPA
CORRACTS[1]	RCRA[2] Corrective Actions	USEPA
CERCLIS/ NFRAP[4]	Sites currently or formerly under review by the USEPA	USEPA
TSD	RCRA permitted treatment, storage, disposal facilities	USEPA
US BROWNFIELDS	U.S. Brownfields sites	USEPA
VCP	Voluntary Cleanup Program	STATE
SPL	State equivalent priority	STATE
SCL	State equivalent CERCLIS[3] list	STATE
LUST	Leaking underground storage tanks	State Regulatory Commission
SWLF	Permitted as solid waste landfills, incinerators or transfer stations	State/Regional Regulatory Commission
DEED RSTR	Sites with deed restrictions	STATE
CORTESE[5]	State index of properties with hazardous waste	STATE
TOXIC PITS	Toxic pits cleanup facilities	STATE
WATER WELLS	Federal and State Drinking Water Sources	USGS/STATE
RCRA Viol	RCRA violations/ enforcement actions	USEPA
TRIS	Toxic Release Inventory Database	USEPA
UST/AST	Registered underground or aboveground storage tanks	STATE
HIST UST	Historical UST Registered Database	STATE
RCRIS SQG[6]	Sites that generate hazardous materials	USEPA
HAZNET	Hazardous Waste Information System	STATE
WDS[7]	Waste Discharge System	STATE

NOTES: [1]CORRACTS: Corrective Action Report System, a USEPA database of corrective actions taken at a RCRA-regulated site.
[2]RCRA: Resource Conservation and Recovery Act.
[3]CERCLIS: Comprehensive Environmental Response, Compensation and Liability Information System.
[4]NFRAP: No further remedial action planned (archived CERCLIS sites).
[5]CORTESE: Based on input from 14 state databases.
[6]RCRIS SQG: Resource Conservation and Recovery Information System small quantity generator. According to Federal guidelines, a SQG produces less than 1,000 kg/month of non-acutely hazardous wastes.
[7]WDS: California Water Resources Control Board Waste Discharge System
SOURCE: EDR Report, 2005.

The Madera site was not listed on any regulatory agency database as having previous or current hazardous materials involvement. The database search located five sites with known history of storage, use, or release of hazardous materials within a one-mile search radius of the Madera site. **Table 3.10-4** summarizes the findings of the database report.

The first site is the AICO site located adjacent to the Madera site at 17486 Road 23. The AICO site is listed on the HAZNET database as producing 0.0208 tons of off-specification, aged, or surplus organics. The organics were taken off-site for recycling.

TABLE 3.10-4
MADERA SITE: OFF-SITE HAZARDOUS MATERIALS

Database	Site Name / Address	Material	Media Affected	Case Status
HAZNET	AICO 17486 Road 23 Madera, CA	Off-specification, aged, or surplus organics	No reported releases or violations	Materials are removed off site for recycling
HAZNET	Madera Municipal Golf Course 23200 Avenue 17 Madera, CA	Aqueous solution with less than 10% total organic residues	No reported releases or violations	Treatment tank
HAZNET	Andrew Tahan. 23783 Avenue 17 Madera, CA	Asbestos containing waste	No reported releases or violations	Disposal/ Land Fill
CA FID UST	Valley Grains Products 23865 Avenue Madera, CA	Not Reported	No reported leaks	Inactive USTs
HAZNET	Valley Grains Products 23865 Avenue Madera, CA	1. Liquids with chromium (VI). 2. Liquids with pH less than 2 with metals. 3. Liquids with halogenated organic compounds	No reported illegal releases or violations	Materials are removed off site to a transfer station
WDS	Valley Grains Products 23865 Avenue Madera, CA	Water	No reported illegal releases or violations	Active
HAZNET	A – Z Manufacturing 17462 Baldwin Street Madera, CA	Oxygenated solvents[1]	No reported releases or violations	Materials are removed off site to a transfer station

NOTES: [1]Acetone, Butanol, Ethyl Acetate
Source: EDR, 2005.

The second site is the Madera Municipal Golf Course site located approximately 0.30 miles south of the Madera site at 23200 Avenue 17. The Golf Course site is listed on the HAZNET database as having a treatment tank that treats an aqueous solution with less than 10% total organic residues.

The third site is the Andrew Tahan site located approximately 0.45 miles south of the Madera site at 23783 Avenue 17. The Andrew Tahan site is listed on the HAZNET database as producing 2.53 tons of asbestos-containing wastes that were transferred to a landfill.

The fourth site is the Valley Grains Products, Inc. site located approximately 0.75 miles west of the Madera site at 23865 Avenue 18. The Valley Grains Products, Inc. site is listed on three databases including the California Facility Inventory Database (CA FID UST) as the location of an inactive underground storage tank. The site is listed on the HAZNET database as producing liquids with the following constituents: chrominum, pH less than two with metals, and halogentated organic compounds. The site is also listed on the California Water Resources Control Board Waste Discharge System (WDS) database as a facility that has been issued waste discharge requirements by the state. The EDR report identifies the site as an industrial facility that treats and/or disposes of liquid or semisolid wastes from any servicing, producing, manufacturing or processing operation of whatever nature, including mining, gravel washing, geothermal operations, air conditioning, ship building and repairing, oil production, storage and disposal operations, and water pumping. The waste type is classified as process waste, which is waste produced as part of the industrial and manufacturing process. The site is identified as a Category C facility, which is a facility having no treatment systems, such as cooling water dischargers or those who must comply through best management practices, facilities with passive waste treatment and disposal systems, such as septic systems with subsurface disposal, or dischargers having waste storage systems with land disposal such as dairy waste ponds. The EDR report did not list any reported leaks or spills associated with the Valley Grains Products, Inc. site.

The fifth and final site is the A-Z Manufacturing site located approximately 0.75 miles west of the Subject Property at 17462 Baldwin Street. The A-Z Manufacturing site is listed on the HAZNET database as producing 0.1485 tons of oxygenated solvents that are taken off site to a transfer station.

North Fork Site

The North Fork site was not listed on any regulatory agency database for storage, use or release of hazardous materials. The database search located one site within a one-mile search radius with a known history of storage, use, and release of hazardous materials (**Table 3.10-5**, **Appendix P**). The former North Fork Mill site is located approximately 0.85 miles southwest of the Subject Property at 57839 Road 225. The site was operated as a lumber mill from 1942 to 1994. South Fork Timber Industries was the last operator of the lumber mill. In 1994 the property was donated to the redevelopment agency of Madera County. Pentachlorophenol was used in the dip solution to retard fungal growth on the lumber until its use as a fungicide was discontinued in the 1980's. A wood waste-fired cogeneration plant was operated on site from 1987 to 1994. The facility was fired by wood waste generated in the production of lumber at the sawmill, as well as

by wood from outside sources. Ash generated by the co-generation plant was stored on site pending removal and off-site disposal. All equipment and buildings at the cogeneration plant have been entirely removed.

TABLE 3.10-5
NORTH FORK SITE: OFF-SITE HAZARDOUS MATERIALS

Database	Site Name / Address	Material	Media Affected	Case Status
VCP	Former North Fork Mill Site 57839 Road 225 North Fork, CA	Not Reported	Soil and Groundwater	Not Reported
CERSLIS-NFRAP	Dinuba Timber Inc North Fork 57839 Road 225 North Fork, CA	Not Reported	Not Reported	Archived 7/20/1990
State LUST	Dinuba Timber Inc North Fork 57839 Road 225 North Fork, CA	Diesel	Soil	Case Closed 10/27/1987
HAZNET	Dinuba Timber Inc North Fork 57839 Road 225 North Fork, CA	1. Asbestos containing waste 2. Waste oil and mixed oil 3. Liquids with PCBs	No reported violations	1. Removed to landfill waste 2. Removed off site for recycling 3. Incernated
HIST UST	Dinuba Timber Inc North Fork 57839 Road 225 North Fork, CA	Diesel, waste oils, and unleaded gasoline	NA	Not Reported
State LUST	Sequoia Forest Products 57839 Road 225 North Fork, CA	Gasoline	Groundwater	Active

Source: EDR, 2005

The database report contained a number of alternate names for the former North Fork Mill site. These include Bendix Forrest Products and American Forest Products (AFP). According to the database report the AFP site has been a lumber mill processing plant since 1942. From 1948 until 1968, pine boards were dipped into a preservative to retard staining. Copper 8-quinolinolate (PQ-8) and pentachlorophenol (PCP) were two of the preservatives used. Wastewater generated by the mill and wood waste generated by the cogeneration facility was disposed of to an existing pond system. In 1986 Regional Water Quality Control Board (RWQCB) and California Department of Toxic Substances Control (DTSC) sampled water in an area near dip pond #2. PCP and 2, 3, 4, 5- tetrachlorophenol were detected at 6 µg/L. AFP is currently operating on a Waste Discharge Requirement Permit under RWQCB oversight. RWQCB currently monitors the pond and any discharge to the nearby creek.

The former North Fork Mill site is listed on the Federal Brownfields database as a targeted site that will undergo assessments. A Brownfield property is real property, the expansion,

redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. The site is also listed on the CERCLIS-NFRAP database as Dinuba Timber, Inc., North Fork site. CERSLIS-NFRAP assessment history listed in the database report identifies the site as being archived in 1990. The former mill site is also listed as a small quantity generator with no violations. The former mill site is also listed on the Leaking Underground Storage Tank (LUST) database as a closed case. Soils were excavated and treated to remove diesel fuels from soil. The former mill site is also listed on the HAZNET database as having produced 1.68 tons of asbestos-containing waste that were removed off site to a landfill. The former mill site also produced 3.336 tons of waste oil and mixed oils that were removed off site and recycled. The mill is also listed on the State Historical Underground Storage Tank (HIST UST) database as the site of 14 USTs. The USTs were used for unleaded gasoline, diesel fuel, and waste oils. The tanks ranged in size from 300 gallons to 14,000 gallons (**Appendix P**).

In the late 1990's and over a period of about two years, USEPA representatives completed soil assessment related activities at the site. As a result of the work, and other recent assessment work, pentachlorophenol has been identified in site soils, and diesel and other fuels have been identified in groundwater. In 2003, Madera County was the recipient of a Brownfields Assessment Grant from the USEPA. This grant is intended to provide the funds necessary for completing needed assessment work at the North Fork Mill site. The Regional Water Quality Control Board (RWQCB) is overseeing assessment work associated with the diesel and other fuels in groundwater at the site. A pending Voluntary Cleanup Agreement (VCA) with Madera County includes provisions for the Department of Toxic Substances Control (DTSC) to provide review and oversight of other assessment-related activities for the former mill site. These include a remedial investigation, risk assessment, and a feasibility study. Madera County received a $200,000 assessment grant from the USEPA. Madera County plans to complete a Remedial Investigation, Health-Based Risk Assessment, and Feasibility Study. A provision for the Department of Toxic Substances Control (DTSC) to provide oversight is included in the VCA.

The former North Fork mill site is located more than 0.5 miles from the North Fork Rancheria and down gradient with respect to the anticipated groundwater flow direction. It is therefore not likely that contaminants migrated such a distance and affected subsurface conditions on the Subject Property.

3.10.3 VISUAL RESOURCES

MADERA SITE

The Madera site is located in a rural, agricultural area on the outskirts of the City of Madera in unincorporated Madera County. The Madera site is undeveloped except for a ranch house and barn complex located on the site's southeastern corner. The Madera site is used for agriculture,

rural residential, and open space purposes. The only public viewpoints of the Madera site are from surrounding roadways. The views from Road 23, Avenue 18, Golden State Boulevard, and State Route 99 (SR-99) are relatively unobstructed. The topography of the project site is level, with above-ground power lines present through the center of the site. The site is vegetated with agricultural crops and very few trees are present except in the vicinity of the ranch complex. The site is bounded on the north by Avenue 18, rural residential land, light industrial land, and vacant land; on the east by Golden State Boulevard and SR-99; on the south by agricultural and rural residential land; and on the west by Road 23 and agricultural land. The Madera site is not visible from any local or State-designated scenic corridors.

NORTH FORK SITE

The North Fork site is located in a rural area in unincorporated Madera County near the Community of North Fork. The North Fork site is currently utilized for rural residential purposes. The topography of the North Fork site is mountainous, with slopes of approximately 25% from the site's eastern to western border. Vegetation on the site consists primarily of mixed oak/conifer woodlands. There are no public viewpoints of the North Fork site. The North Fork site is surrounded by rural residential land uses; it is not visible from any local or State designated scenic corridors.