# Section 3.5
# Air Quality and Climate Change

# 3.5 Air Quality and Climate Change

## 3.5.1 Introduction

This section describes the affected environment and regulatory setting for air quality and greenhouse gases (GHGs). It also describes the impacts on air quality and GHGs (and the related impact of GHG emissions on climate change) that would result from implementation of the proposed project, and mitigation measures that would reduce those impacts. Potential cumulative impacts on air quality and GHGs/climate change are discussed in Chapter 4, *Other CEQA Analyses*.

Following is a summary of the impacts and a description of the terminology and background used for the air quality and GHG/climate change analysis.

### 3.5.1.1 Summary of Significant Impacts

Table 3.5-1 presents a summary of the significant impacts on air quality and GHGs/climate change. All potentially significant impacts would be reduced to a less-than-significant level with mitigation measures. See Section 3.5.6, *Impacts*, and Section 3.5.7, *Mitigation Measures*, for a detailed discussion of all impacts and mitigation measures.

The project would be consistent with the local air district's Air Quality Management Plan. Construction activities would result in temporarily significant criteria pollutant emissions which can be reduced to a less than significant level with routine construction mitigation measures. Impacts from project operations would be significant for Alternatives 4C-3 and 4C-5 because they include above-ground (ex-situ) treatment facilities resulting in worker commute and material truck delivery emissions; however, these impacts can be mitigated to a less than significant level through vehicle emissions reduction measures. Impacts from project operations on criteria pollutants would be less than significant for all Alternatives ~~4C-4 because it includes substantially more agricultural treatment~~, but ~~and~~ the health risk from toxic air contaminants would be above the MDAQMD cancer risk threshold of 10 risks per million for Alternative 4C-4; however, this impact can be mitigated to a less than significant level through use of clean diesel-powered equipment for operation. There would also be health risks to sensitive receptors from ~~C~~construction diesel exhaust emissions, but the impact ~~health risks to sensitive receptors~~ would be less than significant due to the highly dispersed nature and short duration of construction activities ~~and the short duration~~. Health risks due to operational diesel exhaust emissions would only be significant for alternatives including above-ground treatment facilities due to material truck delivery emissions, but these impacts can be mitigated to a less than significant level through vehicle emissions reduction measures. Operational ~~greenhouse gas (~~GHG~~)~~ emissions would be significant, but can be reduced to a less than significant level through implementation of performance standards identified in San Bernardino County's greenhouse gas emissions reduction plan. The project would not result in substantial increased exposure of property or persons to future impacts resultant from projected climate change effects.

**Table 3.5-1. Summary of Significant Air Quality and GHGs Impacts Update**

| Impact | Applicable Alternative | Significance before Mitigation | Mitigation Measures | Significance after Mitigation |
|---|---|---|---|---|
| AIR-1a: Conflict with or Obstruct Implementation of Mojave Desert Air Quality Management District Attainment Plans for Criteria Pollutants | All Alternatives | Less than Significant | None Required | -- |
| AIR-1b: Exceed MDAQMD Threshold Levels for Criteria Pollutants during Project Construction | No Project, 4B, 4C-2, 4C-4 | Less than Significant | AIR-MM-4: ~~(~~Implement Dust Control Measures during Construction and Operations~~, MDAQMD Rule 403)~~ | Less than Significant |
| | 4C-3, 4C-5 | Potentially Significant | AIR-MM-1: ~~(~~Utilize Clean Diesel-Powered Construction Equipment during Construction~~)~~<br>AIR-MM-2: ~~(~~Ensure ~~Modern~~ Fleet~~s~~ Modernization for On-Road Material Delivery and Haul Trucks during Construction~~)~~<br>AIR-MM-3: ~~(~~Implement Emission-Reduction Measures during Construction~~)~~<br>AIR-MM-4 | Less than Significant |
| AIR-1c: Exceed MDAQMD Threshold Levels for Criteria Pollutants from Project Operations | ~~No Project, 4B, 4C-2, 4C-4~~ All Alternatives | Less than Significant | AIR-MM-4 | Less than Significant |
| | ~~4C-3, 4C-5~~ | ~~Potentially Significant~~ | ~~AIR-MM-4~~ | ~~Less than Significant~~ |
| AIR-2a: Expose Nearby Receptors to Increased Health Risk Associated with Toxic Air Contaminants during Construction | All Alternatives | Potentially Significant | AIR-MM-1<br>AIR-MM-2<br>AIR-MM-3 | Less than Significant |
| AIR-2b: Expose Nearby Receptors to Increased Health Risk Associated with Toxic Air | No Project, 4B, 4C-2, 4C-3, 4C-5 | Less than Significant | None Required | -- |

| Impact | Applicable Alternative | Significance before Mitigation | Mitigation Measures | Significance after Mitigation |
|---|---|---|---|---|
| Contaminants from Operations | 4C-4 | Potentially Significant | AIR-MM-5: {Utilize Clean Diesel-Powered Equipment for Operation of Agricultural Treatment and Above-Ground Treatment Facilities} | Less than Significant |
| AIR-3a: Create Objectionable Odors at Nearby Receptors during Construction | All Alternatives | Less than Significant | None Required | -- |
| AIR-3b: Create Objectionable Odors at Nearby Receptors during Operation | All Alternatives | Less than Significant | None Required | -- |
| AIR-4a: Generate GHG Emissions, Either Directly or Indirectly, That May Have a Significant Impact on the Environment or Conflict with the Goals of AB 32 | No Project | Less than Significant | None Required | -- |
| | 4B, 4C-2, 4C-4 | Potentially Significant | AIR-MM-6: {Implement San Bernardino County GHG Construction Standards during Construction} AIR-MM-7: {Implement San Bernardino County GHG Operational Standards for Operations} | Less than Significant |
| | 4C-3, 4C-5 | Potentially Significant | AIR-MM-6 AIR-MM-7 AIR-MM-8: {Implement San Bernardino County GHG Design Standards} | Less than Significant |
| AIR-4b: Expose Property or Persons to the Physical Effects of Climate change | All Alternatives | Less than Significant | None Required | -- |

## 3.5.1.2 Terminology and Background Information

This section provides terminology and background information to the air quality and GHG/climate change analysis. Additional background information is provided in Appendix D.

### Criteria Air Pollutants and Toxic Air Contaminants

In accordance with the federal Clean Air Act (CAA) and the California Clean Air Act (CCAA), the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (ARB) have established national ambient air quality standards (NAAQS) and California ambient air quality standards (CAAQS), respectively, for six criteria pollutants: ozone, carbon monoxide, lead, nitrogen dioxide, sulfur dioxide, and particulate matter, which consists of particulate matter that is 10

microns in diameter or less (PM10) and particulate matter that is 2.5 microns in diameter or less (PM2.5).

If a pollutant concentration is lower than the state or federal standard, the area is classified as being in *attainment* for that pollutant. If a pollutant violates the standard, the area is considered a *nonattainment* area. If data are insufficient to determine whether a pollutant is violating the standard, the area is designated *unclassified*. The CAA and CCAA are discussed further in Section 3.5.2, *Regulatory Setting*.

Ozone and nitrogen dioxide are considered regional pollutants because they (or their precursors) affect air quality on a regional scale; nitrogen dioxide reacts photochemically with reactive organic gases to form ozone, and this reaction occurs at some distance downwind of the source of pollutants. Pollutants such as carbon monoxide, sulfur dioxide, and lead are considered to be local pollutants that tend to accumulate in the air locally. Particulate matter is considered to be a local as well as a regional pollutant. Toxic air contaminants are localized pollutants with no ambient standards, but can produce adverse human health effects. The principal characteristics surrounding the pollutants of primary concern in the study area are discussed in further detail in Appendix D.

### Greenhouse Gas Emissions and Climate Change

According to the EPA, a GHG is any gas that absorbs infrared radiation in the atmosphere. This absorption traps heat within the atmosphere, maintaining Earth's surface temperature at a level higher than would be the case in the absence of GHGs. GHGs include water vapor, carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$), halogenated chlorofluorocarbons (HCFCs), ozone ($O_3$), perfluorinated carbons (PFCs), and hydrofluorocarbons (HFCs). Naturally occurring GHGs include water vapor, $CO_2$, $CH_4$, $N_2O$, and $O_3$. Human activities add to the levels of most of these naturally occurring gases. The sources and sinks of each GHG are further discussed in Appendix D.

GHGs listed in California law and the State CEQA Guidelines include $CO_2$, $CH_4$, $N_2O$, HFCs, PFCs, and sulfur hexafluoride [$SF_6$]) (Health and Safety Code 38505(g); 14 CCR 15364.5). A detailed description of GHGs, including sources and sinks[1] of each, is provided in Appendix D.

GHG emissions from all sources are quantified, converted to $CO_2$-equivalent ($CO_2e$), and presented in terms of metric tons (MT) of $CO_2e$ emitted per year ($MTCO_2e$). A description of the $CO_2e$ reporting convention is provided in Appendix D.

## 3.5.2 Regulatory Setting

The EPA and ARB have established NAAQS and CAAQS in accordance with the CAA and CCAA, respectively, for six criteria pollutants: ozone, carbon monoxide, lead, nitrogen dioxide, sulfur dioxide, and particulate matter described in Section 3.5.1. The ARB has divided the state into 15 air basins, generally based on similar meteorological and geographic conditions. The project area is in the Mojave Desert Air Basin (MDAB), and the Mojave Desert Air Quality Management District (MDAQMD) has jurisdiction over air quality in this region. The following sections describe these federal, state and local agencies and the rules and regulations applicable to the project related to air quality and GHG emissions.

[1] A sink removes and stores GHGs in another form. For example, vegetation is a sink because it removes atmospheric $CO_2$ during respiration and stores the gas as a chemical compound in its tissues.

### 3.5.2.1 Federal Regulations

## Criteria Pollutants

#### Federal Clean Air Act and Ambient Air Quality Standards

The CAA, promulgated in 1970 and amended twice thereafter (including the 1990 amendments), establishes the framework for modern air pollution control. The CAA requires the EPA to designate areas within the country as either attainment or nonattainment for each criteria pollutant based on whether NAAQS have been achieved (Table 3.5-2). Most standards have been set to protect public health and are known as *Primary Standards*. For some pollutants, standards known as *Secondary Standards* have been based on values such as protection of crops, protection of materials, or avoidance of nuisance conditions.

Areas that do not meet the NAAQS are required to develop and adopt state implementation plans (SIPs), which are air quality plans showing how air quality standards will be attained. Failing to submit a plan or secure approval could lead to denial of federal funding and permits for such improvements as highway construction and sewage treatment plants. In cases where the state submits a SIP that fails to demonstrate achievement of the standards, the EPA is directed to prepare a federal implementation plan.

## Toxic Air Contaminants

The CAA identified 188 pollutants as being air toxics, which are also known as hazardous air pollutants (HAP). Note that the CAA definition of HAPs and the CCAA definition of toxic air contaminants are assumed to be the same for purposes of analysis. From this list, the EPA identified a group of 21 as mobile source air toxics (MSAT) in its final rule, Control of Emissions of Hazardous Air Pollutants from Mobile Sources (66 *Federal Register* 17235) in March 2001. From this list of 21 MSATs, the EPA has identified six MSATs (benzene, formaldehyde, acetaldehyde, diesel particulate matter [DPM]/diesel exhaust organic gases, acrolein, and 1,3-butadiene) as being priority MSATs. To address emissions of MSATs, the EPA has issued a number of regulations that have and will continue to dramatically decrease MSATs through cleaner fuels and cleaner engines. The toxic air contaminant most relevant to the proposed project is DPM, which would be emitted from diesel equipment and vehicles.

## Greenhouse Gas Emissions and Climate Change

Although there is currently no federal overarching law specifically related to climate change or the reduction of GHGs, the EPA is presently regulating GHG emissions under the federal Clean Air Act. Although periodically debated in Congress, no comprehensive federal legislation concerning greenhouse gas limitations is likely until at least 2013, if then. A summary of GHG and climate change developments at the federal level is provided in Appendix D.

**Table 3.5-2. National and State Air Quality Standards Applicable in California**

| | | | Standard (ppm) | | Standard (µg/m$^3$) | | Violation Criteria | |
|---|---|---|---|---|---|---|---|---|
| Pollutant | Symbol | Average Time | California | National | California | National | California | National |
| Ozone* | $O_3$ | 1 hour | 0.09 | -- | 180 | -- | If exceeded | -- |
| | | 8 hours | 0.070 | 0.075 | 137 | 147 | If exceeded | If fourth-highest 8-hour concentration in a year, averaged over 3 years, is exceeded at each monitor in an area |
| Carbon monoxide | CO | 8 hours | 9.0 | 9 | 10,000 | 10,000 | If exceeded | If exceeded on more than 1 day per year |
| | | 1 hour | 20 | 35 | 23,000 | 40,000 | If exceeded | If exceeded on more than 1 day per year |
| (Lake Tahoe only) | | 8 hours | 6 | -- | 7,000 | -- | If equaled or exceeded | -- |
| Nitrogen dioxide | $NO_2$ | Annual arithmetic mean | 0.030 | 0.053 | 57 | 100 | If exceeded | If exceeded on more than 1 day per year |
| | | 1 hour | 0.18 | 0.100 | 339 | 188 | If exceeded | -- |
| Sulfur dioxide | $SO_2$ | 24 hours | 0.04 | 0.14 | 105 | -- | If exceeded | -- |
| | | 1 hour | 0.25 | 0.075 | 655 | 196 | If exceeded | If exceeded on more than 1 day per year |
| | | 3 hours | -- | 0.50* | -- | 1,300* | -- | -- |
| | | Annual arithmetic mean | -- | 0.030 | -- | -- | -- | If exceeded on more than 1 day per year |
| Hydrogen sulfide | $H_2S$ | 1 hour | 0.03 | -- | 42 | -- | If equaled or exceeded | -- |
| Vinyl chloride | $C_2H_3Cl$ | 24 hours | 0.01 | -- | 26 | -- | If equaled or exceeded | -- |
| Inhalable particulate matter | PM10 | Annual arithmetic mean | -- | -- | 20 | -- | -- | -- |
| | | 24 hours | -- | -- | 50 | 150 | If exceeded | If exceeded on more than 1 day per year |
| | PM2.5 | Annual arithmetic mean | -- | -- | 12 | 15 | -- | If 3-year average from single or multiple community-oriented monitors is exceeded |
| | | 24 hours | -- | -- | -- | 35 | -- | If 3-year average of 98$^{th}$ percentile at each population-oriented monitor in an area is exceeded |
| Sulfate particles | $SO_4$ | 24 hours | -- | -- | 25 | -- | If equaled or exceeded | -- |
| Lead particles | Pb | Calendar quarter | -- | -- | -- | 1.5 | -- | If exceeded no more than 1 day per year |
| | | 30-day average | -- | -- | 1.5 | -- | If equaled or exceeded | -- |
| | | Rolling 3-month average | -- | -- | -- | 0.15 | If equaled or exceeded | Averaged over a rolling 3-month period |

Source: California Air Resources Board 2012.

* = secondary standard; ppm = parts per million; µg/m$^3$= micrograms per cubic meter.

## 3.5.2.2 State Regulations

### Criteria Pollutants

#### California Clean Air Act

Similar to the federal CAA, the CCAA of 1988 requires the ARB to designate areas within the state as either attainment or nonattainment for each criteria pollutant based on whether the CAAQS have been achieved (Table 3.5-2). Under the CCAA, areas are designated as nonattainment for a pollutant if air quality data shows that a state standard for the pollutant was violated at least once during the previous three calendar years. Exceedances that are affected by highly irregular or infrequent events are not considered violations of a state standard and are not used as a basis for designating areas as nonattainment.

Responsibility for achieving the CAAQS, which are more stringent than federal standards for certain pollutants and averaging periods, is placed on the ARB and local air pollution control districts. State standards are achieved through district-level air quality management plans that are incorporated into the SIP, for which the ARB is the lead agency.

The act also requires that local and regional air districts expeditiously adopt and prepare an air quality attainment plan if the district violates state air quality standards for $O_3$, carbon monoxide, sulfur dioxide, or nitrogen dioxide. These plans are specifically designed to attain state standards and must be designed to achieve an annual 5% reduction in district-wide emissions of each nonattainment pollutant or its precursors. No locally prepared attainment plans are required for areas that violate the state PM10 standards; the ARB is responsible for developing plans and projects that achieve compliance with the state PM10 standards.

### Toxic Air Contaminants

California regulates toxic air contaminants primarily through the Tanner Air Toxics Act (Assembly Bill [AB] 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). AB 1807 created California's program to reduce exposure to air toxics, while 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.

In September 2000, the ARB approved a comprehensive diesel risk reduction plan to reduce emissions from both new and existing diesel-fueled engines and vehicles. The goal of the plan is to reduce diesel PM10 (respirable particulate matter) emissions and the associated health risk by 75% in 2010 and by 85% by 2020 from new and existing on-road vehicles (e.g., heavy-duty trucks and buses), off-road equipment (e.g., graders, tractors, forklifts, sweepers, and boats), portable equipment (e.g., pumps), and stationary engines (e.g., stand-by power generators). The plan identifies 14 measures that the ARB will implement over the next several years. Because the ARB measures are enacted before any phase of construction, the proposed project would be required to comply with applicable diesel control measures(California Air Resources Board 2000).

To date, the ARB has identified 21 toxic air contaminants, and has also adopted EPA's list of HAPs as toxic air contaminants. In August 1998, DPM was added to the ARB list of toxic air contaminants (California Air Resources Board 1998). As an ongoing process, the ARB reviews air contaminants and identifies those that are classified as toxic air contaminants. The ARB also continues to establish

new programs and regulations for the control of toxic air contaminants, including diesel particulate matter, as appropriate.

### Greenhouse Gas Emissions and Climate Change

A variety of legislation has been enacted in California relating to climate change, much of which sets aggressive goals for GHG reductions in the state.

The following is a summary of key state regulations concerning GHG emissions:

- Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006 requires the state to reduce GHG emissions to 1990 levels by 2020.
- The AB 32 Scoping Plan (2008) contains the main strategies California will use to implement AB 32. As part of the scoping plan, the ARB has been adopting regulations including for the low carbon fuel standard and for the cap and trade system, among others, for reducing GHG emissions to achieve the emissions cap by 2020.
- Senate Bill 1078/107 obligated investor-owned utilities (IOUs), energy service providers (ESPs) and community choice aggregators (CCAs) to obtain 20% of their electricity from qualified renewable sources by 2010. SB 2 X1 sets forth a longer range target of procuring 33% of retail sales from qualified renewable sources by 2020.
- AB 1493 (2002 and 2009 amendments, "Pavley" Rules) and Advanced Clean Cars (2011) together are expected to increase average fuel economy to roughly 43 miles per gallon (mpg) by 2020 and reduce GHG emissions from the transportation sector in California by approximately 14%. The standards through 2016 have been adopted. The EPA and ARB are working together on joint rulemaking and adoption of standards for 2017 to 2025.
- EO S-01-07 mandates that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10% by 2020, which is referred to as the Low Carbon Fuel Standard (LCFS).
- The State CEQA Guidelines, as amended in 2010, require lead agencies to analyze a project's GHG emissions. The adopted guidelines recommend quantification of GHG emissions, assessment of their significance, and adoption of feasible mitigation of GHG emissions when significant impacts are identified. The state has not adopted any significance thresholds for use in CEQA to date.

A detailed list of documents and regulations related to GHGs and climate change in California is provided in Appendix D.

## 3.5.2.3 Local Regulations

### Criteria Pollutants

As described above, the MDAQMD has jurisdiction for the desert portion of San Bernardino County, including the project area and vicinity, and the far eastern end of Riverside County portions of the MDAB. Like all the air quality districts, the MDAQMD's responsibilities include overseeing stationary-source emissions, approving permits, maintaining emissions inventories, maintaining air quality stations, overseeing agricultural burning permits, and reviewing air quality–related sections of environmental documents required by CEQA. The MDAQMD is also responsible for establishing

and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws and for ensuring that NAAQS and CAAQS are met.

### Mojave Desert Air Quality Management District Attainment Plans

All areas designated as nonattainment under both the CCAA and CAA are required to prepare plans showing how the area would meet their respective state and federal air quality standards by designated attainment dates. The MDAQMD has adopted attainment plans to achieve CAAQS and NAAQS to comply with these regulatory requirements. The most recent and relevant air quality plans for the project area are the 2008 Ozone Attainment Plan for the Western Mojave Desert Non-Attainment Area (for 8-hour $O_3$ NAAQS), the 2004 Ozone Attainment Plan (for 1-hour $O_3$ NAAQS), and the 1995 Mojave Desert Planning Area Federal Particulate Matter Attainment Plan. A summary of recent MDAQMD Attainment Plans is shown in Table 3.5-3.

The MDAB is downwind of the South Coast Air Basin, and to a lesser extent, of the San Joaquin Valley. Prevailing winds transport ozone and ozone precursors from both regions into and through the MDAB during the summer ozone season. The ARB identifies the South Coast Air Basin as having an overwhelming and significant impact on the MDAB and the San Joaquin Valley as having an overwhelming impact on the MDAB. Local MDAQMD emissions contribute to exceedances of both the NAAQS and CAAQS for ozone, but photochemical ozone modeling conducted by the South Coast Air Quality Management District (SCAQMD) and ARB indicates that the MDAB would be in attainment of both standards without the influence of this transported air pollution from upwind regions (Mojave Desert Air Quality Management District 2008).

**Table 3.5-3. Mojave Desert Air Quality Management District Attainment Plans**

| Name of Plan | Date of Adoption | Standard(s) Targeted | Applicable Area | Pollutant(s) Targeted | Attainment Date |
|---|---|---|---|---|---|
| Federal 8-Hour Ozone Attainment Plan (Western Mojave Desert Non-attainment Area) | 6/9/2008 | Federal 8-hour ozone (84 ppb) | Western Mojave Desert Non-attainment Area (MDAQMD portion) | $NO_X$ and VOC | 2021 |
| 2004 Ozone Attainment Plan (State and Federal) | 4/26/2004 | Federal 1-hour ozone | Entire District | $NO_X$ and VOC | 2007 |
| Attainment Demonstration, Maintenance Plan, and Redesignation Request for the Trona Portion of the Searles Valley PM10 Non-attainment Area | 3/25/1996 | Federal daily and annual PM10 | Searles Valley Planning Area | PM10 | N/A |
| Triennial Revision to the 1991 Air Quality Attainment Plan | 1/22/1996 | State 1-hour ozone | Entire District | $NO_X$ and VOC | 2005 |
| Mojave Desert Planning Area Federal Particulate Matter Attainment Plan | 7/31/1995 | Federal daily and annual PM10 | Mojave Desert Planning Area | PM10 | 2000 |
| Searles Valley PM10 Plan | 6/28/1995 | Federal daily and annual PM10 | Searles Valley Planning Area | PM10 | 1994 |

Source: Mojave Desert Air Quality Management District 2011

MDAQMD's primary means of implementing air quality plans and policies are through adoption and enforcement of rules and regulations. MDAQMD regulates a large variety of stationary sources of air pollution, including but not limited to aerospace, cement manufacturing, electricity generation, fiberglass manufacturing, mining, and wastewater treatment.

In addition, the proposed action may be subject to the following MDAQMD rules. This list of rules may not be all-encompassing, as additional MDAQMD rules may apply to the project as specific developments are identified. These are rules that have been adopted by MDAQMD to reduce emissions throughout the Mojave Desert Planning Area. Failure to comply with any applicable MDAQMD rule would be a violation of said rule and subject to MDAQMD enforcement action (Mojave Desert Air Quality Management District 2011).

- **MDAQMD Rule 402—Nuisance:** Forbids the discharge of such quantities of air contaminants or other material that cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public; or that endanger the comfort, repose, health or safety of any such persons or the public; or that cause, or have a natural tendency to cause, injury or damage to business or property.
- **MDAQMD Rule 403.2—Fugitive Dust Control for the Mojave Desert Planning Area:** Restricts fugitive dust from construction/demolition and other activities in the Mojave Desert Planning Area. Specifies numerous restrictions to operators of construction/demolition for all projects greater than a half-acre in size (e.g., periodic watering, covering loaded haul vehicles, stabilize graded surfaces, cleanup project dust/debris on paved surfaces, reduce non-essential earth moving), and specifies additional rules for projects disturbing more than 100 acres per day (e.g., dust control plan, stabilized access routes).
- **MDAQMD Rule 404—Particulate Matter Concentration:** A person shall not discharge into the atmosphere from any source particulate matter, except liquid sulfur compounds, in excess of the concentration at standard conditions.
- **MDAQMD Rule 1300—New Source Review**: Sets forth the requirements for the preconstruction review of all new or modified Facilities, to ensure that the construction, or modification of facilities subject to this regulation does not interfere with the attainment and maintenance of ambient air quality standards.

**Mojave Desert Air Quality Management District CEQA Guidelines.**

MDAQMD's CEQA guidance recommends certain specific criteria pollutant thresholds which are presented in Section 3.5.4 below.

## Climate Change and Greenhouse Gases

The ARB's AB 32 Scoping Plan (Scoping Plan) states that local governments are "essential partners" in the effort to reduce GHG emissions. The Scoping Plan also acknowledges that local governments have "broad influence and, in some cases, exclusive jurisdiction" over activities that contribute to significant direct and indirect GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. The Scoping Plan encourages local governments to reduce GHG emissions by approximately 15% from current levels by 2020.

**San Bernardino County Greenhouse Gas Reduction Plan (December 2011)**

San Bernardino County adopted a GHG Reduction Plan in December 2011 to accomplish the following specific objectives to:

- Reduce emissions from activities over which the County has jurisdictional and operational control consistent with the target reductions of the AB32 Scoping Plan;
- Provide estimated GHG reductions associated with the County's existing sustainability efforts and integrate the County's sustainability efforts into the discrete actions of this Plan;
- Provide a list of discrete actions that will reduce GHG emissions; and
- Approve a GHG Plan that satisfies the requirements of Section 15183.5 of the California Environmental Quality Act (CEQA) Guidelines, so that compliance with the GHG Plan can be used in appropriate situations to determine the significance of a project's effects relating to GHG emissions, thus providing streamlined CEQA analysis of future projects that are consistent with the approved GHG Plan.

The County GHG Reduction Plan, along with state reduction measures, would reduce GHG emissions by 15% compared to 2007 levels in the County. The Plan requires discretionary projects in the County to comply with certain requirements. If a discretionary project has more than 3,000 $MTCO_2e$ emissions per year, then it is required to reduce its emissions by 31% and may use a screening table provided in the Plan to help identify its reduction measures. If a discretionary project has less than 3,000 MT $CO_2e$ emissions, the project is required to meet mandatory GHG reducing performance standards to improve the energy efficiency, water conservation, vehicle trip reduction potential, and other areas. The performance standards also apply to ministerial and categorically exempt projects. Since the County's GHG plan meets all the requirements of Section 15183.5 of the CEQA Guidelines, a project that is consistent with the County's Plan can be determined to have less than significant GHG emissions because it is part of a plan overall that will reduce emissions consistent with AB 32 (San Bernardino County 2011).

**Mojave Desert Air Quality Management District**

MDAQMD Rule 1211 (Greenhouse Gas Provisions of Federal Operating Permits) sets forth emission reporting requirements for facilities which emit or have the potential to emit 100,000 tons of $CO_2e$ during any 12-month period. MDAQMD's CEQA guidance recommends use of a significance threshold for greenhouse gas emissions of 100,000 tons $CO_2e$/year (90,718 MT $CO_2e$) and 548,000 pounds/day (249 MT $CO_2e$).

## 3.5.3 Environmental Setting

This section discusses the existing conditions related to air quality and GHGs in the project area and in the vicinity. Ambient air quality is affected by climatological conditions, topography, and the types and amounts of pollutants emitted. Therefore, the discussion begins with a description of the relevant characteristics of the MDAB and an overview of conditions affecting ambient air pollutant concentrations in the basin.

### 3.5.3.1 Topography and Climate

The MDAB includes the desert portion of San Bernardino County, the far eastern end of Riverside County, and Antelope Valley portion of Los Angeles County. The MDAB is an assemblage of mountain

ranges interspersed with long broad valleys that often contain dry lakes. Many of the lower mountains that dot the vast terrain rise from 1,000 to 4,000 feet above the valley floor. Prevailing winds in the MDAB are out of the west and southwest. These prevailing winds are due to the proximity of the MDAB to coastal and central regions and the blocking nature of the Sierra Nevada mountains to the north; air masses pushed onshore in southern California by differential heating are channeled through the MDAB. The MDAB is separated from the southern California coastal and central California valley regions by mountains (highest elevation is approximately 10,000 feet), whose passes form the main channels for these air masses (Mojave Desert Air Quality Management District 2011).

During the summer the MDAB is generally influenced by a Pacific subtropical high cell that sits off the coast, inhibiting cloud formation and encouraging daytime solar heating. The MDAB is rarely influenced by cold air masses moving south from Canada and Alaska, as these frontal systems are weak and diffuse by the time they reach the desert. Most desert moisture arrives from infrequent warm, moist, and unstable air masses from the south. The MDAB averages between 3 and 7 inches of precipitation per year (from 16 to 30 days with at least 0.01 inches of precipitation). The MDAB is classified as a dry-hot desert climate, with portions classified as dry-very hot desert, indicating at least 3 months have maximum average temperatures over 100.4°F (Mojave Desert Air Quality Management District 2011).

In the project vicinity, the average January temperatures are 35°F (low) and 61°F (high), and the average July temperatures are 69°F (low) and 102°F (high) according to the Barstow climate and air quality monitoring station. Annual temperatures vary greatly, with maximum temperatures equaling or exceeding 90°F an average of 131 times per year, and minimum temperatures equaling or dropping below 32°F an average of 38 times per year. The annual average precipitation in the project vicinity is 5.1 inches (Western Regional Climate Center 2012). The predominant wind direction at the Daggett-Barstow Airport, approximately 20 miles east–southeast of the project site, is from the west at approximately 11.3 miles per hour (5.0 meters per second (WebMet 2002).

### 3.5.3.2 Existing Air Quality Conditions

Existing air quality conditions in the project area and vicinity can be characterized by the monitoring data collected in the region. The project area is located in the western portion of the MDAB, and the closest monitoring station is the Barstow station (ARB Station No. 36155) located approximately 6 miles east of the project area at 1301 West Mountain View Street, Barstow. The Barstow station monitors major criteria pollutants including carbon monoxide, nitrogen dioxide, PM10, and ozone. The closest monitoring station that monitors the remaining pollutant, PM2.5, is the Victorville–Park Avenue station (ARB Station No. 36306) located approximately 29 miles south of the project area at 14306 Park Avenue, Victorville. Table 3.5-4 presents air monitoring data from the Barstow and Victorville monitoring stations.

As shown in Table 3.5-4, both the 1-hour and 8-hour ozone concentrations have exceeded state and federal standards multiple times during the 3-year reporting period. PM10 concentrations have also exceeded state and federal standards. carbon monoxide, nitrogen dioxide, and PM2.5 concentrations remained below state and national standards during the 3-year reporting period.

Both the EPA and ARB have designated portions of the MDAQMD nonattainment for a variety of pollutants, and some of those designations have an associated classification. The air quality designations for the San Bernardino portion of the MDAB, which includes the proposed project area, are summarized in Table 3.5-5. The project area lies within the Western Mojave Desert ozone nonattainment area, which also includes the Antelope Valley portion of Los Angeles County.

**Table 3.5-4. Ambient Air Quality Monitoring Data Collected from the Barstow (ARB Station No. 36155) and Victorville (ARB Station No. 36306) Monitoring Stations**

| Pollutant Standards | 2008 | 2009 | 2010 |
|---|---|---|---|
| Ozone ($O_3$)—Barstow | | | |
| State Maximum 1-hour concentration (ppm) | 0.104 | 0.095 | 0.097 |
| State Maximum 8-hour concentration (ppm) | 0.097 | 0.087 | 0.078 |
| National Maximum 8-hour concentration (ppm) | 0.096 | 0.086 | 0.078 |
| National fourth-highest 8-hour concentration (ppm) | 0.090 | 0.077 | 0.073 |
| National Design Value | 0.086 | 0.083 | 0.080 |
| *Number of Days Standard Exceeded* | | | |
| CAAQS 1-hour (>0.09 ppm) | 5 | 1 | 1 |
| CAAQS 8-hour (>0.070 ppm) | 23 | 18 | 7 |
| NAAQS 8-hour (>0.075 ppm) | 7 | 5 | 1 |
| Carbon Monoxide (CO)—Barstow | | | |
| Maximum 1-hour concentration (ppm) | 1 | 1 | 1 |
| Maximum 8-hour concentration (ppm) | 1.23 | 0.89 | 0.89 |
| *Number of Days Standard Exceeded* | | | |
| NAAQS/CAAQS 1-hour (>35/20 ppm) | 0 | 0 | 0 |
| NAAQS/CAAQS 8-hour (>9, >9.0 ppm) | 0 | 0 | 0 |
| Nitrogen Dioxide ($NO_2$)—Barstow | | | |
| Maximum 1-hour concentration (ppm) | 0.081 | 0.060 | 0.062 |
| Annual average concentration (ppm) | 0.019 | 0.016 | 0.017 |
| *Number of Days Standard Exceeded* | | | |
| CAAQS 1-hour (>0.18 ppm) | 0 | 0 | 0 |
| Particulate Matter (PM10)—Barstow | | | |
| National maximum 24-hour concentration ($\mu g/m^3$) | 93.0 | 76.0 | 38.0 |
| National second-highest 24-hour concentration ($\mu g/m^3$) | 56.0 | 65.0 | 35.0 |
| State maximum 24-hour concentration ($\mu g/m^3$) | 88.0 | 72.0 | 35.0 |
| State second-highest 24-hour concentration ($\mu g/m^3$) | 54.0 | 59.0 | 32.0 |
| National annual average concentration ($\mu g/m^3$) | 26.1 | 26.8 | 18.8 |
| State annual average concentration ($\mu g/m^3$) | N/A | 25.0 | N/A |
| *Number of Days Standard Exceeded* | | | |
| CAAQS 24-hour (>50 $\mu g/m^3$) – Measured | 2 | 2 | 0 |
| NAAQS 24-hour (>150 $\mu g/m^3$) – Estimated | 0.0 | 0.0 | 0.0 |
| Particulate Matter (PM2.5)—Victorville | | | |
| National maximum 24-hour concentration ($\mu g/m^3$) | 17.0 | 20.0 | 18.0 |
| National second-highest 24-hour concentration ($\mu g/m^3$) | 16.0 | 17.0 | 15.0 |
| National 98$^{th}$ percentile concentration ($\mu g/m^3$) | N/A | 17.0 | 15.0 |
| National annual average concentration ($\mu g/m^3$) | N/A | 8.9 | 7.2 |
| State annual average concentration ($\mu g/m^3$) | N/A | 9.3 | 7.6 |
| *Number of Days Standard Exceeded* | | | |
| NAAQS 24-hour (>35 $\mu g/m^3$) | N/A | 0.0 | 0.0 |

Source: California Air Resources Board 2012; U.S. Environmental Protection Agency 2012.
ppm = parts per million CAAQS = California ambient air quality standards
NAAQS = national ambient air quality standards $\mu g/m^3$ = micrograms per cubic meter

**Table 3.5-5. Federal and State Attainment Status Designations in the Project Area**

| Pollutants | Status | |
|---|---|---|
| | Federal | State |
| Ozone | 1-hour: N/A<br>8-hour: Nonattainment, Moderate | 1-hour: Nonattainment, Moderate<br>8-hour: Not yet classified |
| Particulate Matter (PM10) | Nonattainment, Moderate | Nonattainment |
| Particulate Matter (PM2.5) | Unclassified/Attainment | Nonattainment |
| Carbon Monoxide (CO) | Attainment/Unclassified | Attainment |
| Nitrogen Dioxide ($NO_2$) | Attainment/Unclassified | Attainment/Unclassified |
| Sulfur Dioxide ($SO_2$) | Attainment/Unclassified | Attainment |

Source: Mojave Desert Air Quality Management District 2011; California Air Resources Board 2011a.

### 3.5.3.3 Sensitive Receptors

There is a strong connection between health risk and the proximity of the source of air pollution. Diesel-related exhaust, specifically diesel particulate matter (DPM), is considered a toxic air contaminant by the ARB. Typical sources of acutely and chronically hazardous air pollution and toxic air contaminants include diesel exhaust, industrial manufacturing, distribution centers, transportation projects, gasoline dispensing, automotive repair, and dry cleaning facilities. Local jurisdictions have responsibility for determining land use compatibility for sensitive receptors. A sensitive receptor is a person in the population who is particularly susceptible to health effects due to exposure to an air contaminant, such as children, the elderly, or the infirm. The ARB has identified the following people as the most likely to be affected by air pollution: children younger than 14, people older than 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. According to the MDAQMD, sensitive receptors and land uses include residences, schools, daycare centers, playgrounds, and medical facilities (Mojave Desert Air Quality Management District 2011).

The greatest concentration of residences in the project area are in the western portion of the project area north of the Hinkley School (Figure 3.2-1). Single-family and rural residences are also dispersed along roadways throughout the project study area. The Hinkley School (along Hinkley Road north of the railroad) and a senior center are also located in the project area.

### 3.5.3.4 Existing Greenhouse Gas Emissions

As described in Section 3.5.1.2, increasing levels of GHGs in the atmosphere result in an increase in the temperature of the Earth's lower atmosphere, a phenomenon which is commonly referred to as global warming or climate change.

Over 97% of U.S. GHG emissions are the result of burning fossil fuels. Of these GHGs, 83% are in the form of $CO_2$, 10% are $CH_4$, and 4.5% are $N_2O$. Fossil fuels are burned to power vehicles, create electricity, and generate heat. Vehicle emissions are the largest source of $CO_2$ emissions in California, representing 37% of statewide emissions in 2008. Electrical generation is the second largest source of emissions in California at 24% (California Air Resources Board 2010a). On a national level electrical generation is the largest emissions sector and transportation is the second largest (U.S. Environmental Protection Agency 2011a). Other sources of GHG emissions generated within the U.S. and California include agriculture, land clearing, the landfilling of waste, refrigerants, and certain

industrial processes. Within San Bernardino County, stationary sources, primary from cement plants, represent the largest source of current emissions (46%), while transportation (29%) and building energy use (21%) are the next largest sources. Table 3.5-6 outlines the most recent global, national, state, and countywide GHG inventories to help contextualize the magnitude of potential project-related emissions.

**Table 3.5-6. Global, National, State, and Local GHG Emissions Inventories**

| Emissions Inventory | $CO_2e$ (metric tons) |
|---|---|
| 2004 IPCC Global GHG Emissions Inventory | 49,000,000,000 |
| 2009 EPA National GHG Emissions Inventory | 6,633,200,000 |
| 2008 ARB State GHG Emissions Inventory | 477,700,000 |
| 2007 San Bernardino County Emissions Inventory | 6,592,777 |

Source: Intergovernmental Panel on Climate Change 2007a, U.S. Environmental Protection Agency 2011a, California Air Resources Board 2010b, San Bernardino County 2011.

### 3.5.3.5 Emissions from Existing Remediation Activities

Current groundwater remediation activities in the project area include in-situ treatment (pumping of extraction and injection wells) and agricultural treatment (land application for crop production, including crop harvesting and tilling). Emissions from these existing remediation activities consist of daily worker commute and ethanol delivery vehicle exhaust, re-entrained paved and unpaved road dust, diesel-powered equipment (e.g., tractors, baler, cutter) for alfalfa plowing and harvesting, and electricity consumption associated with well pumping. Estimated criteria pollutant and GHG emissions associated with existing remediation activities are presented in Table 3.5-7.

**Table 3.5-7. Estimated Operational Emissions Associated with Existing Conditions**

| | Pounds Per Day | | | | | | Metric Tons Per Year | | |
|---|---|---|---|---|---|---|---|---|---|
| | ROG | $NO_X$ | CO | $SO_X$ | PM10 | PM2.5 | $CO_2$ | Other | $CO_2e$ |
| Operational Emissions under Existing Conditions | 2<br>~~1~~ | 23<br>~~9~~ | 13<br>~~3~~ | 2<br>~~1~~ | 12<br>~~11~~ | 3 | 467<br>~~447~~ | 10 | 477<br>~~457~~ |

Source: URBEMIS 2007; EMFAC 2011; U.S. Environmental Protection Agency 2011b; ICF Emissions Modeling

Emissions from sources not related to existing remediation activities including the PG&E Compressor Station, Hinkley residents, traffic along SR 58, and agriculture and other businesses in the Hinkley Valley are not included in Table 3.5-7.

## 3.5.4 Significance Criteria

The State CEQA Guidelines, Appendix G (14 CCR 15000 et seq.), have identified significance criteria to be considered when determining whether a project could result in significant air quality and GHGs/climate change effects. For this analysis, an impact pertaining to air quality and GHGs/climate change was considered significant under CEQA if it would:

- Conflict with or obstruct implementation of applicable regional air quality plans addressing criteria air pollutants.
- Exceed MDAQMD threshold levels during construction or operations.
- Expose nearby receptors to increased health risk associated with toxic air contaminants during construction or operations.
- Create objectionable odors at nearby receptors.
- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment or conflict with the goals of AB 32.
- Expose property or persons to the physical effects of climate change.

Following is the approach established for using these criteria to assess impacts, based primarily on MDAQMD's CEQA and Federal Conformity Guidelines.

**Conflict with Applicable Regional Air Quality Plans.** A project is conforming if it complies with all applicable MDAQMD rules and regulations, complies with all proposed control measures that are not yet adopted from the applicable plan(s), and is consistent with the growth forecasts in the applicable plan(s) (or is directly included in the applicable plan). Conformity with growth forecasts can be established by demonstrating that the project is consistent with the land use plan that was used to generate the growth forecast (Mojave Desert Air Quality Management District 2011).

**Exceed MDAQMD Emissions Thresholds**. The MDAQMD recommends that its quantitative air pollution thresholds be used to determine the significance of project emissions, as shown in Table 3.5-8.

**Table 3.5-8. Mojave Desert Air Quality Management District Significance Thresholds for Construction and Operations**

| Threshold | ROG | $NO_X$ | CO | $SO_X$ | PM10 | PM2.5 | $CO_2e$* |
|---|---|---|---|---|---|---|---|
| Daily Threshold (pounds) | 137 | 137 | 548 | 137 | 82 | 82 | 548,000 |
| Annual Threshold (tons) | 25 | 25 | 100 | 25 | 15 | 15 | 100,000 |

Source: Mojave Desert Air Quality Management District 2011.
Note: The MDAQMD also includes thresholds for $H_2S$ and lead, but those are not included in this analysis, as none of the project alternatives would result in $H_2S$ or lead emissions.
*Although MDAQMD has adopted this $CO_2e$ threshold, the analysis herein uses San Bernardino County's 3,000 $MTCO_2e$ threshold.

The MDAQMD considers direct impacts to be those that result directly from a proposed project. In this case, the direct impacts would be construction emissions from both on- and off-road vehicle and equipment sources during construction activities. Indirect impacts would be impacts that result from changes that would occur as a result of the project. An example would be new roadway infrastructure to support a new subdivision. Cumulative impacts are the combination of direct and indirect impacts. Therefore, the same thresholds are used to determine a project-level impact and a "cumulatively considerable" net increase in criteria pollutants (Mojave Desert Air Quality Management District 2011). Note that because the project is a multi-phased project with separate construction and operational phases, pursuant to MDAQMD guidelines, the project's construction

and operational criteria pollutant emissions are summed daily and compared to the daily thresholds in Table 3.5-8 separately.

**Expose Receptors to Increased Health Risk.** The MDAQMD recommends using the following thresholds: total cancer risk of 10 in a million and a noncancerous hazard index greater than or equal to 1.

**Create Objectionable Odors.** While offensive odors rarely cause any physical harm, they can be very unpleasant, leading to considerable distress among the public and often generating citizen complaints to local governments and air districts. According to ARB's *Air Quality and Land Use Handbook*, land uses associated with odor complaints typically include sewage treatment plants, landfills, recycling facilities, and manufacturing (California Air Resources Board 2005). Odor impacts on residential areas and other sensitive receptors (e.g., schools, hospitals, daycare centers) warrant the closest scrutiny, but consideration should also be given to other land uses where people may congregate (e.g., recreational facilities, work sites, commercial areas). The MDAQMD has no published numeric thresholds regarding odors, but generally odors are considered significant if there is a verified odor complaint within the previous three years. Also, MDAQMD Rule 402—Nuisance forbids the discharge of air contaminants that cause nuisance or annoyance to any considerable number of persons or to the public. Therefore, the potential to frequently expose the public to objectionable odors would be deemed a significant impact.

**Generate GHG Emissions.** A project would have significant impacts if it would generate GHG emissions that would result in a significant impact on the environment or would conflict with any plan, policy, or regulation adopted for the purpose of reducing GHG emissions. As described above, San Bernardino County has adopted the San Bernardino County Greenhouse Gas Emissions Reduction Plan (December 2011), which meets CEQA Guidelines Section 15183.5 for a qualified plan which allows projects that are consistent with the Plan to be determined to have a less than significant impact if they comply with all of the Plan requirements. As part of the Plan, the County established screening criteria for new residential and commercial projects. For projects that would emit below a 3,000 $MTCO_2e$ threshold per year, including those projects exempt from CEQA, the County developed a set of performance standards that all projects must implement as Conditions of Approval. For projects that exceed the 3,000 $MTCO_2e$ threshold per year, the County established screening tables and a point-based GHG reduction measure system are used to mitigate impacts. Projects that implement enough GHG reduction using the screening tables are considered to have provided their "fair share" contribution of reductions and are considered consistent with the GHG Plan.

As discussed in the impact analysis below, the project would result in less than 3,000 $MTCO_2e$ per year of GHG emissions. Per the San Bernardino GHG Emissions Reduction Plan, the mandatory performance standards are the measure of compliance with the Plan for this project. Although the MDAQMD has a significance threshold of 100,000 tons of $CO_2e$, this EIR utilizes consistency with the San Bernardino GHG Reduction Plan as the measure of significance instead as a more conservative approach to evaluation of GHG emissions and climate change for the action alternatives.

Because the No Project Alternative was approved prior to adoption of the County GHG Emissions Reduction Plan, the Plan does not apply to this alternative. Thus, evaluation of GHG emissions for the No Project Alternative was thus done by comparing to the MDAQMD threshold.

Given that the County's GHG Emissions Reduction Plan was developed to be consistent with requirements and reduction goals of AB 32, analysis of GHG emissions and consistency with AB 32 are considered together.

**Exposure of People or Property to Physical Effects of Climate Change.** State CEQA Guidelines Section 15126.2 states that EIRs should "evaluate any potentially significant impacts of locating development in other areas susceptible to hazardous condition (e.g., floodplains, coastlines, wildfire risk areas) as identified in authoritative hazard maps, risk assessments or in land use plans addressing such hazard areas." With this, a lead agency should include an assessment of significant adverse impacts a project might cause by bringing development and people into an area affected by climate change (California Air Pollution Control Officers Association 2008). In conducting such an evaluation, the agency should focus on the long-term impacts of the project that are more likely to experience the effects of climate change in the future. The analysis herein discusses the potential impacts of climate change on each alternative, consistent with the State CEQA Guidelines and as described in published guidance documents (see California Air Pollution Control Officers Association 2008 and California Air Pollution Control Officers Association 2009).

Note that an appellate court in *Ballona Wetland Foundation v. City of Los Angeles* (2011) (201 Cal. App. 4th 455) held that an EIR is not required to evaluate "impacts of the environment on a project." However, the Water Board as lead agency has decided that the issue of climate change impacts on the project is important for the public and decision-makers to understand and, therefore, it has been included in the EIR for informational purposes.

## 3.5.5 Methodology

This section describes how air quality and climate change impacts are evaluated for both operation and construction of the project. Information regarding construction and operations within OU1 and OU2 are based on information obtained from PG&E project engineers, and the methods to quantify emissions within OU1 and OU2 are discussed in the following section. Groundwater monitoring and assessment activities are currently ongoing in OU3. Although there are currently no remediation activities in OU3, in-situ treatment and/or agricultural land treatment could occur in OU3 in the future, if required to address the expanded plume. Therefore, for purposes of analysis, emissions from OU3 are estimated based on scaling factors for each alternative, as described in detail in Section 2.7 of Chapter 2, *Project Description*.

The key sources of data and information used in the preparation of this section are listed and briefly described below.

- Mojave Desert Air Quality Management District *CEQA and Federal Conformity Guidelines* (Mojave Desert Air Quality Management District 2011).
- San Bernardino County Greenhouse Gas Emissions Reduction Plan (San Bernardino County 2011).
- Construction and operations activity data from the project applicant.
- Published emission factor and estimation models and methodologies from the ARB and EPA.
- Scaling up of applicant's data from the feasibility studies and addenda to reflect an expanded plume area.

The methodology for analyzed construction emissions and operations emissions is described below. Also refer to the approach described above in Section 3.5.4, *Significance Criteria*.

### 3.5.5.1 Construction Emissions

This impact analysis was conducted consistent with MDAQMD requirements as set forth in their *CEQA and Conformity Guidelines* handbook (Mojave Desert Air Quality Management District 2011). Construction-period criteria pollutant and $CO_2e$ emissions were quantified using a combination of the URBEMIS 2007 (version 9.2.4)(California Air Resources Board 2006) model, emission factors from EMFAC 2011 web tool (California Air Resources Board 2011b), emission factors from the OFFROAD 2007 (California Air Resources Board 2007) model, GHG emission factors from the General Reporting Protocol (The Climate Registry 2012), crop fugitive dust emission factor from the ~~C~~ARB (California Air Resources Board 2003), and re-entrained paved road dust methodology from EPA's AP-42, Section 13.2.1 (U.S. Environmental Protection Agency 2011b). Assumptions regarding daily construction activities (equipment types and number, daily hours of use, worker and delivery trips, excavation activities) were obtained from the project applicant, as described in Section 2.9 of Chapter 2, *Project Description.* As summarized in Table 2-9, construction activities for all alternatives would include initial site clearing and grading, well installation and development, and pipeline installation. Additionally, Alternative 4C-3 would include construction of two above-ground treatment facilities, and Alternative 4C-5 would include construction of one above-ground treatment facility. A summary of construction quantities both before and after scaling are shown in Table 3.5-9. Total metric tons of $CO_2e$ were calculated based on the GWP for each pollutant and the total activity for each alternative. A description of the $CO_2e$ reporting convention employed herein is provided in Appendix D.

For initial buildout when most project construction would occur for all project alternatives, for the purposes of analysis construction activities were assumed~~are planned~~ to begin in September 2013 and last through July 2014 for Alternative 4B and through 2015 for all other action alternatives. ~~Therefore,~~ T~~t~~hese timeframes are only used for purposes of the impact analysis. Actual~~However,~~ construction could begin and end at later dates.

The URBEMIS2007 model was used to quantify criteria pollutant and $CO_2$ emissions from off-road construction equipment exhaust and fugitive dust from grading and trenching activities based on information from the project applicant. Emissions associated with worker commute; material, asphalt, and concrete deliveries; and haul trucks were estimated using year 2013 annual average EMFAC2011 emission rates for San Bernardino County portion of the MDAB. Exhaust emission rates from EMFAC2011 for light duty vehicles, light duty trucks, and medium duty vehicles were utilized in conjunction with the worker commute trip data received from the project applicant. Similarly, emission rates for heavy-duty tractor trucks (T7 Tractor) were used with the materials delivery and waste hauling trip data to account for delivery and waste hauling trips. Re-entrained road dust was quantified using EPA re-entrained road dust methodology for paved roads.

Daily construction activities were calculated based on the construction quantities shown in Table 3.5-9 and the number of days per construction period. Emissions from all off- and on-road emission sources were summed and compared to MDAQMD daily regional significance thresholds shown in Table 3.5-8. Note that construction emissions are based on the initial construction buildout numbers only, as this represents the time period with the most construction activities for all alternatives. Emissions associated with this time period are considered to represent the maximum daily emissions associated with construction activities for all project alternatives. Note that this only applies to construction, as operational emissions described in the following section (Section 3.5.5.2) are based on full buildout of each alternative.

**Table 3.5-9. Estimated New Construction Quantities by Alternative**

| | Before Scaling | | | | After Scaling | | | |
|---|---|---|---|---|---|---|---|---|
| Alternative | Agricultural Treatment Unit (Acres) | Pipeline (linear feet) | Wells | Above-Ground Treatment Facility (square feet) | Agricultural Treatment Unit (Acres) | Pipeline (linear feet) | Wells | Above-Ground Treatment Facility (square feet) |
| No Project | 0 | 16,407 | 45 | 0 | 0 | 16,407 | 45 | 0 |
| 4B | 40 | 19,557 | 48 | 0 | 264 | 58,805 | 219 | 0 |
| 4C-2 | 169 ~~168~~ | 26,142 | 60 | 0 | 393~~2~~ | 68,245 | 233 | 0 |
| 4C-3 | 169 ~~168~~ | 50,322 | 79 ~~82~~ | 81,060 | 393~~2~~ | 72,507 | 265 | 125,705 |
| 4C-4 | 713 | 40,572 | 60 ~~63~~ | 0 | 1,212 | 132,631 | 303 | 0 |
| 4C-5 | 169 ~~168~~ | ~~32,317~~ 28,077 | 60 | 37,500 | 393~~2~~ | 70,664 | 233 | 37,500 |

Notes:

All numbers represent new infrastructure in addition to that which already existed as of late 2011.

"Before Scaling" refers to the data on remedial infrastructure provided by PG&E based on the conceptual alternatives design in the Feasibility Study/Addenda. As discussed in Chapter 2, the Feasibility Study/Addenda evaluated the remedial infrastructure needed to address chromium plume as it is existed in 2010 and early 2011.

"After Scaling" refers to estimates of the potential amount of remedial infrastructure that may be needed to address the chromium plume as it exist~~s~~ed in the Fourth Quarter 2011, when it was somewhat larger than in 2010 and early 2011, plus an assumed 15% potential expansion ~~in the future~~beyond the Q4 2011 plume. As discussed in Chapter 2, ICF worked with PG&E to scale up the potential infrastructure using various scaling factors and considerations for different remedial actions. The "after scaling" numbers are used for environmental analysis as they represent a conservative estimate.

Please note that after the calculations were completed for the Final EIR, updated information on the number of existing monitoring wells was received (see Appendix B). Since the scaling approach to estimate future monitoring wells was based on an escalation from the existing number of monitoring wells (as shown in Appendix B), the estimate of future monitoring wells would also increase. However, the air calculations did not include the revised escalated monitoring well estimate. This would only change the air quality analysis in minor ways. For instance, the amount of land disturbed due to monitoring well installation would only change by perhaps 3 acres if the escalated revised estimate were used. Given that the land disturbance of all of the action alternatives is on the scale of several hundred acres or more, this minor change would not change the conclusions of the EIR.

## 3.5.5.2 Operations Emissions

Operational activities associated with each alternative would result in a continuous source of criteria pollutant and GHG emissions associated with worker vehicle commute trips, materials delivery truck trips, waste hauling truck trips, and the operation of wells and above-ground treatment facility equipment.

Emissions associated with worker vehicle commute trips, materials delivery truck trips, and waste hauling truck trips from each alternative were quantified using emission factors from the EMFAC2011 web tool and trip data from the project applicant. Exhaust emission factors from EMFAC2011 for light duty vehicles, light duty trucks, and medium duty vehicles were utilized in conjunction with the worker commute trip data received from the project applicant in estimating emissions associated with worker trips. Similarly, an emission factor for heavy-duty tractor trucks was used with the materials delivery and waste hauling trip data to account for delivery and waste hauling trips. Re-entrained road dust was quantified using EPA re-entrained road dust methodologies for paved and unpaved roads. The variables used to estimate motor vehicle emissions are summarized in Table 3.5-10. Note that ~~while~~ the ex-situ materials delivery and waste hauling trips maximum daily VMT shown in Table 3.5-10 is monthly VMT~~would occur sporadically~~

~~throughout the year,the daily emission calculations assume one trip on the maximum day~~. However, the calculations herein assume emissions from the ex-situ materials delivery and waste hauling trips would occur on a single maximum day, since ex-situ maintenance trips occur once per month. Annual VMT assumes ex-situ materials delivery and waste hauling trips occur once per month, or 12 times per year.

GHG emissions from diesel fuel consumption at the above-ground facility were determined using annual diesel consumption provided by the project engineers and diesel fuel GHG emission factors from the Climate Registry (2012). Criteria pollutant emissions from diesel fuel consumption at the above-ground facility were quantified using the provided fuel consumption data and emission factor data from URBEMIS2007. It was assumed that diesel engines have a brake specific fuel consumption (BSCF) of 0.05 gallons per horsepower-hour, based on a BSCF of 0.367 pounds per horsepower-hour for both the forklift (URBEMIS default of 145 HP) and generator set (~~URBEMIS default of 549~~ 400 HP) and an average diesel fuel density of 7.1 pounds per gallon (U.S. Environmental Protection Agency 2012). The calculation of daily and annual emissions assumes there would be 240 working days per year for all elements of project operations for all alternatives.

Operational criteria pollutant and GHG emissions resulting from continued operation of extraction and injection wells, and dosing equipment were quantified using published emission factor data and electricity consumption data from the project applicant. EPA's eGRID2012 was used to gather $NO_X$, $SO_X$, $CH_4$~~e~~, and $N_2O$ emission factors (U.S. Environmental Protection Agency 2012). While eGRID publishes $CO_2$ emission factors for the Western Electricity Coordinating Council (WECC) region based on 2009 emissions data, a utility-specific $CO_2$ emission factor was obtained from PG&E's 2010 Electric Power Sector Report. Because eGRID does not publish reactive organic gases, carbon monoxide, and particulate matter emission factor data, emission factors for those emission types were obtained from the University of California Davis Institute of Transportation Studies study for the Los Angeles region (Delucchi 2006).

**Table 3.5-10. Maintenance and Operations Sources of Emissions by Alternative**

| | | Totals Before Scaling | | Totals After Scaling (1) | |
|---|---|---|---|---|---|
| Alternative | Activities | Max. Daily (2) | Annual | Max. Daily (2) | Annual |
| *Existing* | *Worker Commute (VMT)* | *25* | *6,000* | *25* | *6,000* |
| | *Ethanol Deliveries (VMT)* | *240* | *1,485~~2,880~~* | *240* | *1,485~~2,880~~* |
| | *Electricity Consumption (kwh)* | *8,510* | *2,042,501* | *8,510* | *2,042,501* |
| | *Harvesting and Plowing (acres)* | *--* | *182* | *--* | *182* |
| No Project | Worker Commute(VMT) | 25 | 6,000 | 25 | 6,000 |
| | Ethanol Deliveries (VMT) | 240 | 1,485~~2,880~~ | 240 | *1,485~~2,880~~* |
| | Electricity Consumption (kwh) | 27,422 | 6,581,323 | 27,422 | 6,581,323 |
| | Harvesting and Plowing (acres) | -- | *182* | -- | *182* |
| Alternative 4B | Worker Commute (VMT) | 50 | 12,000 | 73 | 17,549 |
| | Ethanol Deliveries(VMT) | 240 | 1,485~~2,880~~ | 300 | 1,856~~4,212~~ |
| | Electricity Consumption (kwh) | 29,055 | 6,973,263 | 42,491 | 10,197,856 |
| | Harvesting and Plowing (acres) | -- | 222~~40~~ | -- | 446~~264~~ |
| Alternative 4C-2 | Worker Commute (VMT) | 50 | 12,000 | 72 | 17,164 |
| | Ethanol Deliveries (VMT) | 240 | 1,485~~2,472~~ | 300 | 1,856~~3,536~~ |
| | Electricity Consumption (kwh) | 30,362 | 7,286,815 | 42,491 | 10,422,673 |
| | Harvesting and Plowing (acres) | -- | 351~~168~~ | -- | 575~~392~~ |
| Alternative 4C-3 | Worker Commute (Ex-Situ) (VMT) | 120 | 28,800 | 186 | 44,662 |
| | Material Deliveries (Ex-Situ) (VMT) | 240 | 2,880 | 372 | 4,466 |
| | Worker Commute (VMT) | 60~~288~~ | 14,400~~69,120~~ | 418 | 100,242 |
| | Ethanol Deliveries (VMT) | 240 | 1,485 | 300 | 1,856~~2,154~~ |
| | Treatment Residue Disposal (VMT) | 424 | 5,088 | 658 | 7,890 |
| | Ex-Situ Diesel Fuel (gallons) | 5 | 1,200 | 8 | 1,861 |
| | Electricity Consumption (kwh) | 40,424 | 9,701,702 | 58,625 | 14,069,994 |
| | Harvesting and Plowing (acres) | -- | 351~~168~~ | -- | 575~~392~~ |
| Alternative 4C-4 | Worker Commute(VMT) | 50 | 12,000 | 97 | 23,268 |
| | Ethanol Deliveries(VMT) | 240 | 1,485~~2,472~~ | 300 | 1,856~~4,793~~ |
| | Electricity Consumption (kwh) | 30,484 | 7,316,211 | 59,109 | 14,186,259 |
| | Harvesting and Plowing (acres) | -- | 895~~713~~ | -- | 1,394~~1,212~~ |

| Alternative | Activities | Totals Before Scaling | | Totals After Scaling (1) | |
|---|---|---|---|---|---|
| | | Max. Daily (2) | Annual | Max. Daily (2) | Annual |
| Alternative 4C-5 | Worker Commute (Ex-Situ) (VMT) | 120 | 28,800 | 120 | 28,800 |
| | Material Deliveries (Ex-Situ) (VMT) | 240 | 2,880 | 240 | 2,880 |
| | Worker Commute (VMT) | 400 | 96,000 | 572 | 137,214 |
| | Ethanol Deliveries (VMT) | 240 | 1,485 | 300 | 1,856~~2,123~~ |
| | Treatment Residue Disposal (VMT) | 424 | 5,088 | 424 | 5,088 |
| | Ex-Situ Diesel Fuel (gallons) | 5 | 1,200 | 5 | 1,200 |
| | Electricity Consumption (kwh) | 30,261 | 7,262,532 | 43,252 | 10,380,413 |
| | Harvesting and Plowing (acres) | -- | 351~~168~~ | -- | 575~~392~~ |

Source: PG&E 2011.

(1) Data shown herein is the total for each emission source by alternative, and not net new over existing.

(2) The maximum daily is monthly VMT. However, the calculations herein assume emissions from the ex-situ materials delivery and waste hauling trips would occur on a single maximum day, since ex-situ trips occur once per month. Annual VMT assumes ex-situ materials delivery and waste hauling trips occur once per month, or 12 times per year.

~~(2)~~ Note: PG&E data based on Feasibility Study/addenda based on February 2011 plume. ICF scaled up based on estimated plume size 15% larger than December 2011 plume (see discussion in Chapter 2, *Project Description*).

Scaling factors used: Worker Commute(Ex-Situ) = ex situ gpm; Material Deliveries(Ex-Situ) = ex situ gpm; Worker Commute(VMT/day) = # of wells (not including monitoring wells); Ethanol Deliveries(VMT/day)= carbon injection gpm; Treatment Residue Disposal(VMT/day) = ex situ gpm; Ex-Situ Diesel Fuel (gals/yr)= ex situ gpm; Electricity Consumption(kwh/yr) = # of wells (not including mon. wells).

VMT = vehicle miles traveled; kwh = kilowatt hours; yr = year; ex-situ = above-ground treatment facility

### 3.5.5.3 Health Risk

Potential health risk associated with diesel emissions from truck trips, diesel emissions associated with plowing and harvesting, as well as activities related to the above-ground treatment facility during operations of all project alternatives were assessed qualitatively. Potential health risk associated with diesel truck trips for material deliveries and haul trucks were estimated using the San Joaquin Valley Air Pollution Control District's (SJVAPCD's) diesel truck travel health risk assessment screening tool. Note that the SJVAPCD screening tool is commonly used for projects both within and outside the SJVACPD jurisdiction. Because the MDAQMD does not have a similar screening tool, the SJVAPCD tool was used. Estimated truck trip and diesel activities were obtained from the project applicant. The PM10 emission factor was obtained using the EMFAC2011 web-tool for trucks operating in the MDAB portion of San Bernardino County in the year 2014, based on the same methodology used to obtain emission factors for all criteria pollutant and GHG emissions above. To evaluate a worst-case scenario, the screening tool assumed one 50-meter roadway segment, a distance of 25 meters to the nearest receptor, with the receptor located in the worst-case quadrant and roadway travel route operating in a rural area. Finally, the screening analysis assumed a 100% engine load.

Potential health risk associated with diesel exhaust from plowing and harvesting equipment and above-ground treatment facility equipment were estimated using EPA's AERSCREEN model, which is the screening-level model for AERMOD, to model maximum worst-case 1-hour concentrations at nearby receptors based on a single emissions source that are generally slightly more conservative than the AERMOD model. Modeling inputs for this screening assessment include emission rate (in grams per second), source characteristics (release height, stack diameter), and surface characteristics (albedo, Bowen ratio, surface roughness), assuming default worst-case meteorological conditions as generated by AERSCREEN in a rural setting. A 5-meter exhaust emission source height and 1.4-meter initial vertical dispersion are based on the model inputs used in SCAQMD's Final Localized Significance Threshold Methodology (South Coast Air Quality Management District 2005). Emissions associated with plowing and harvest equipment were treated as an elevated area source equal to the size of the total scaled Agricultural Treatment Unit acreage (see Table 3.5-9 for acreage). Note that for purposes of analysis, the size of the area source was equal to the size of the smallest net acreage for the build alternatives over existing plowing and harvest acreage, which, according to Table 3.5-10, is Alternative 4B (446 additional acres minus 182 existing acres = 264~~2~~ acres). Emissions associated with support equipment at the above-ground treatment facility were treated as an elevated area source equal to the size of the treatment facility building. Cancer risk was calculated based on a worst-case 70-year exposure time, assuming an 80$^{th}$ percentile breathing rate, as recommended by the OEHHA. The health risk calculations are based on the specific cancer risk equations presented by the California Air Pollution Control Officers Association (CAPCOA) (2009). Diesel exhaust risk assessment assumes only an inhalation pathway. Health risk from operation of agricultural land treatment and above-ground treatment facilities were calculated for nearest receptors, located approximately 1,000 feet from these facilities.

## 3.5.6 Impacts

This section provides the impact analysis related to air quality and GHGs/climate change. The impacts are organized by topics that correspond with the significance criteria described in Section 3.5.4, *Significance Criteria*. For each impact, an overview with a general discussion of the impact and the significance determination is followed by a discussion of how the impact differs for each of the

alternatives. In cases where an impact would not differ between alternatives, a single discussion of the impact and the significance determination is presented.

### 3.5.6.1 Criteria Pollutants

**Impact AIR-1a: Conflict with or Obstruct Implementation of Mojave Desert Air Quality Management District Attainment Plans for Criteria Air Pollutants (Less than Significant, All Alternatives)**

#### Overview of Impact

During construction and operation, the project would not conflict with or obstruct implementation of MDAQMD's attainment plans for criteria pollutants, including the 2008 Federal 8-Hour Ozone Attainment Plan for the Western Mojave Planning Area and the 1995 Mojave Desert Planning Area Federal PM10 Attainment Plan, which outline MDAQMD's plans and control measures designed to attain both federal and state air quality standards for ozone and PM10. Each plan projects future emissions and identifies the strategies necessary for the reduction of stationary source emissions through regulatory controls.

The MDAQMD plans were crafted to bring the MDAB into attainment status for all criteria pollutants. Pursuant to MDAQMD guidelines, a project is considered to be consistent with applicable air quality plans if it complies with all applicable rules and regulations, complies with proposed control measures of the plan to be adopted, and is consistent with growth forecasts in the applicable air quality plan or plan that was used as the basis of growth forecasts (i.e., relevant land use plans or general plans).

None of the alternatives include actions that would result in growth that exceeds the population projections in the most recent ozone or PM10 plans described above. Project-related emissions are accounted for in the applicable air quality plans as general construction emissions. All project alternatives would comply with all relevant MDAQMD rules and regulations, including the dust control requirements per Rule 403. The project does not include any permanent stationary sources of emissions. Therefore, potential impacts would be less than significant under all alternatives, and no mitigation measures are necessary.

**Impact AIR-1b: Exceed MDAQMD Threshold Levels for Criteria Pollutants during Project Construction (Less than Significant, No Project Alternative and Alternatives 4B, 4C-2, 4C-4; Less than Significant with Mitigation, Alternatives 4C-3 and 4C-5)**

#### Overview of Impact

Construction of all alternatives would result in an increase in criteria pollutant emissions, compared to existing conditions. Construction activities would result in exhaust and dust-related emissions associated with off-road equipment exhaust (graders, loaders, drill rigs), fugitive dust from site disturbance, trenching, and backfilling, vehicle paved and unpaved road travel, on-road exhaust from haul and material delivery trucks, and on-road exhaust from construction employee commutes. Construction activities on a per unit basis (e.g., per acre of grading, per well, per pipeline segment, etc.) are similar for each alternative; however, the intensity of daily activities (e.g., the number of wells and pipeline segments per day, etc.) would vary by alternative, as shown in Tables 2-4 to 2-9 in Chapter 2, *Project Description*. A schedule of construction activities and associated quantities for the initial phase were obtained from the project applicant and used to calculate daily construction

quantities (see Appendix D). Estimated construction emissions for all alternatives are shown in Table 3.5-11.

Under Alternatives 4C-3 and 4C-5, the emissions for $NO_X$ would be above the threshold, and therefore a significant impact would result. Implementation of **Mitigation Measures AIR-MM-1, AIR-MM-2, AIR-MM-3** would reduce the impacts of the action alternatives to less than significant (Table 3.5-12). All alternatives must comply with MDAQMD Rule 403 for dust control and thus **Mitigation Measure AIR-MM-4** would ensure that compliance.

## No Project Alternative and Alternatives 4B, 4C-2, and 4C-4

As described above, implementation of the No Project Alternative and Alternatives 4B, 4C-2 and 4C-4 would result in emission of criteria pollutants from construction-related exhaust and dust, but emissions would be below all MDAQMD thresholds (Table 3.5-11). **Mitigation Measure AIR-MM-4** would ensure all alternatives comply with MDAQMD Rule 403.

## Alternatives 4C-3 and 4C-5

As described above, Alternatives 4C-3and 4C-5 would result in emissions in excess of MDAQMD thresholds for $NO_X$ during construction. Implementation of **Mitigation Measures AIR-MM-1, AIR-MM-2,** and **AIR-MM-3** would reduce $NO_X$ emissions to a less-than-significant level.

Tables 3.5-11 and 3.5-12 show the estimated emissions for all criteria pollutants relative to MDAQMD thresholds before and after mitigation, respectively. Mitigation identified above would reduce this impact to less than significant. **Mitigation Measure AIR-MM-4** would ensure all alternatives comply with MDAQMD Rule 403.

**Table 3.5-11. Estimated Unmitigated Construction Emissions of Criteria Pollutants for Project Alternatives (pounds per day)**

| | Criteria Pollutant | | | | | |
|---|---|---|---|---|---|---|
| Alternative | ROG | $NO_X$ | CO | $SO_X$ | PM10 | PM2.5 |
| No Project | 12 | 94 | 55 | 0 | 15 | 6 |
| Alternative 4B | 13 | 98 | 57 | 0 | 24~~15~~ | 8~~7~~ |
| Alternative 4C-2 | 13 | 98 | 57 | 0 | 24~~16~~ | 8~~7~~ |
| Alternative 4C-3 | 28~~24~~ | **256** | 129~~112~~ | 0 | 43~~33~~ | 17~~15~~ |
| Alternative 4C-4 | 13 | 98 | 57 | 0 | 24~~18~~ | 8~~7~~ |
| Alternative 4C-5 | 28~~24~~ | **256** | 129~~112~~ | 0 | 43~~33~~ | 17~~15~~ |
| *MDAQMD Thresholds* | *137* | *137* | *548* | *137* | *82* | *82* |

Source: URBEMIS 2007; EMFAC 2011; U.S. Environmental Protection Agency 2011b; ICF Emissions Modeling
Emissions in excess of MDAQMD Thresholds are shown in **bold.**

**Table 3.5-12. Estimated ~~Mitigated~~ Construction Emissions of Criteria Pollutants for Project Alternatives with Implementation of Exhaust and Dust Control Measures (pounds per day)**

| | Criteria Pollutant | | | | | |
|---|---|---|---|---|---|---|
| Alternative | ROG | $NO_X$ | CO | $SO_X$ | PM10 | PM2.5 |
| No Project | NA | NA | NA | NA | NA | NA |
| Alternative 4B | NA | NA | NA | NA | NA | NA |
| Alternative 4C-2 | NA | NA | NA | NA | NA | NA |
| Alternative 4C-3 | 15~~13~~ | 26~~24~~ | 120~~103~~ | 0 | 13~~10~~ | 4~~3~~ |
| Alternative 4C-4 | NA | NA | NA | NA | NA | NA |
| Alternative 4C-5 | 15~~13~~ | 26~~24~~ | 120~~106~~ | 0 | 13~~10~~ | 4~~3~~ |
| *MDAQMD Thresholds* | *137* | *137* | *548* | *137* | *82* | *82* |

Source: URBEMIS 2007; EMFAC 2011; U.S. Environmental Protection Agency 2011b; South Coast Air Quality Management District 2010; ICF Emissions Modeling.
Emissions in excess of MDAQMD Thresholds are shown in **bold.**

**Impact AIR-1c: Exceed MDAQMD Threshold Levels for Criteria Pollutants from Project Operations (Less than Significant, ~~No Project~~ All Alternatives ~~and Alternatives 4B, 4C-2, 4C-4; Less than Significant with Mitigation, Alternatives 4C-3 and 4C-5~~)**

## Overview of Impact

Operation and maintenance activities of all alternatives would result in an increase in criteria pollutant emissions compared to existing conditions (Table 3.5-13). Maintenance and operations associated with all alternatives would result in exhaust- and dust-related emissions from agricultural activities at agricultural treatment units, paved and unpaved road travel, on-road exhaust from material delivery trucks, on-road exhaust from employee commutes, and electricity consumption from the well pumps. The operation emissions would be less than significant for all alternatives ~~except Alternatives 4C-3 and 4C-5~~. Emissions for PM10 would be greater with Alternatives 4C-3 and 4C-5 because they include operation and maintenance of above-ground treatment facilities that would have more on-road exhaust and road dust from waste haul trips, equipment use (forklifts, generators, etc.), and electricity consumption. ~~As shown in Table 3.5-13, implementation of **Mitigation Measure AIR-MM-4,** which would require implementing dust control measures during operations, would reduce this to less than significant.~~ Since MDAQMD rule 403 applies regardless of the level of emissions, **Mitigation Measure AIR-MM-4** is required for all alternatives.

### ~~No Project Alternative and Alternatives 4B, 4C-2, and 4C-4~~

~~As described above, implementation of the No Project all Alternatives and Alternatives 4B, 4C-2 and 4C-4 would result in a minor increase in exhaust and dust emissions that would be below all MDAQMD thresholds for criteria pollutants during operations (Table 3.5-13). Therefore, the impact would be less than significant. However, since MDAQMD rule 403 applies regardless of the level of emissions, **Mitigation Measure AIR-MM-4** is required for all alternatives.~~

## ~~Alternatives 4C-3 and 4C-5~~

~~As described above, implementation of Alternatives 4C-3 and 4C-5 would result in increased operations and maintenance activities and associated exhaust and dust emissions, similar to the other alternatives. Additionally, these alternatives include operation of above-ground treatment facilities (two facilities with Alternative 4C-3 and one facility with Alternative 4C-5), which result in increased vehicles trips, increased electricity consumption, and use of diesel equipment. The increased operation and maintenance activities would result in an increase in PM10 emissions that would exceed MDAQMD thresholds during long-term operations. Implementation of **Mitigation Measure AIR-MM-4**, which would require implementing dust control measures during operations, would reduce this to less than significant.~~

**Table 3.5-13. Estimated Unmitigated Operational Emissions of Criteria Pollutants for Project Alternatives over Existing Conditions (pounds per day)**

| Alternative | ROG | $NO_X$ | CO | $SO_X$ | PM10 | PM2.5 |
|---|---|---|---|---|---|---|
| No Project | 1 | 6 | 3 | 3 | 1 | 1 |
| Alternative 4B | 2 ~~12~~ | 14 ~~98~~ | 6 ~~66~~ | 6 | 9 ~~50~~ | 3 ~~13~~ |
| Alternative 4C-2 | 2 ~~6~~ | 14 ~~44~~ | 6 ~~28~~ | 6 | 9 ~~23~~ | 3 ~~6~~ |
| Alternative 4C-3 | 4 ~~7~~ | 41 ~~71~~ | 14 ~~39~~ | 9 | 44 ~~**108**~~ | 8 ~~17~~ |
| Alternative 4C-4 | 3 ~~5~~ | 20 ~~42~~ | 9 ~~24~~ | 8 | 14 ~~24~~ | 4 ~~6~~ |
| Alternative 4C-5 | 2 ~~6~~ | 27 ~~57~~ | 10 ~~35~~ | 6 | 32 ~~**119**~~ | 5 ~~16~~ |
| *MDAQMD Thresholds* | *137* | *137* | *548* | *137* | *82* | *82* |

Source: EMFAC 2011; U.S. Environmental Protection Agency 2006, 2011b, 2012; Delucchi 2006; URBEMIS2007; ICF Emissions Modeling
Emissions associated with Existing Conditions are shown in Table 3.5-10.
There are no e~~E~~missions in excess of MDAQMD Thresholds ~~are shown in **bold**~~.

**~~Table 3.5-14. Estimated Mitigated Operational Emissions of Criteria Pollutants for Project Alternatives over Existing Conditions with Implementation of Dust Control Measures (pounds per day)~~**

| ~~Alternative~~ | ~~ROG~~ | ~~$NO_X$~~ | ~~CO~~ | ~~$SO_X$~~ | ~~PM10~~ | ~~PM2.5~~ |
|---|---|---|---|---|---|---|
| ~~No Project~~ | ~~NA~~ | ~~NA~~ | ~~NA~~ | ~~NA~~ | ~~NA~~ | ~~NA~~ |
| ~~Alternative 4B~~ | ~~NA~~ | ~~NA~~ | ~~NA~~ | ~~NA~~ | ~~NA~~ | ~~NA~~ |
| ~~Alternative 4C-2~~ | ~~NA~~ | ~~NA~~ | ~~NA~~ | ~~NA~~ | ~~NA~~ | ~~NA~~ |
| ~~Alternative 4C-3~~ | ~~NA 7~~ | ~~NA 71~~ | ~~NA 39~~ | ~~NA 9~~ | ~~NA 25~~ | ~~NA 7~~ |
| ~~Alternative 4C-4~~ | ~~NA~~ | ~~NA~~ | ~~NA~~ | ~~NA~~ | ~~NA~~ | ~~NA~~ |
| ~~Alternative 4C-5~~ | ~~NA 6~~ | ~~NA 57~~ | ~~NA 35~~ | ~~NA 6~~ | ~~NA 10~~ | ~~NA 5~~ |
| ~~*MDAQMD Thresholds*~~ | ~~*137*~~ | ~~*137*~~ | ~~*548*~~ | ~~*137*~~ | ~~*82*~~ | ~~*82*~~ |

~~Source: EMFAC 2011; U.S. Environmental Protection Agency 2006, 2011b, 2012; Delucchi 2006; URBEMIS2007; ICF Emissions Modeling~~
~~Emissions associated with Existing Conditions are shown in Table 3.5-10.~~
~~Emissions in excess of MDAQMD Thresholds are shown in **bold**.~~

### 3.5.6.2 Toxic Air Contaminants

**Impact AIR-2a: Expose Nearby Receptors to Increased Health Risk Associated with Toxic Air Contaminants during Construction (Less than Significant with Mitigation, All Alternatives)**

Construction activities associated with all project alternatives would include the use of diesel-powered equipment and vehicles (refer to Table 2-9 and Section 2.9 of Chapter 2, *Project Description).* As described in Section 3.5.3.3 above, diesel exhaust is considered a toxic air contaminant, or toxic air contaminant, and exposure of sensitive receptors (e.g., residences, schools) to toxic air contaminants should be limited. Construction activities would be most intense during the initial buildout period (0-5 years), but would be reduced in intensity beyond the initial buildout period, for greater than 20 years. Construction during the entire construction period would be sporadic and transitory over the entire project area, occurring for short durations at various locations over a large area (including areas OU1, OU2, and OU3). Onsite truck idling associated with diesel truck trips during construction would be minimal, limited to a maximum of 5 minutes per truck, consistent with the ARB's Heavy Duty Idling Reduction Program. Mitigation measures AIR-MM-1 (Tier 4 clean diesel equipment), AIR-MM-2 (modern truck fleet) and AIR-MM-3 (emission reduction measures) would reduce diesel exhaust emissions during construction of all build alternatives. Also, the predominant wind direction in the project vicinity is from the west (blowing east), which would likely disperse pollutants away from the nearest sensitive receptors, which are the residences and school located west of areas OU1 and OU2. Therefore, the associated health risk would be minimal, and this impact is less than significant for all alternatives with mitigation.

**Impact AIR-2b: Expose Nearby Receptors to Increased Health Risk Associated with Toxic Air Contaminants from Operations (Less than Significant, No Project Alternative and Alternatives 4B, 4C-2, 4C-3, 4C-5; Less than Significant with Mitigation, Alternative 4C-4)**

#### Overview of Impact

Operations and maintenance activities for all alternatives would include daily trips to remediation sites in vehicles that could generate diesel exhaust, similar to existing operations and maintenance for in-situ treatment (wells and associated infrastructure) and agricultural treatment. Additionally, Alternatives 4C-3 and 4C-5 would include above-ground treatment facilities that use diesel-powered equipment. With Alternative 4C-3, there would be two facilities, one in area OU1 by the Compressor Station and one in area OU2 by the Desert View Dairy. With Alternative 4C-5, there would be one facility in area OU1 by the Compressor Station.

As described in Section 3.5.3.3, diesel-related exhaust, specifically diesel particulate matter (DPM), is considered a toxic air contaminant by the ARB, and exposure of sensitive receptors (e.g., residences, schools) to toxic air contaminants should be limited. The nearest sensitive receptors are located west and south of area OU1 and west of the northern boundary of OU2 where above-ground treatment facilities would be located. Therefore, a human health risk assessment was conducted for all alternatives to assess the risk associated with project-related activities on nearby receptor locations. The human health risk assessment includes emissions associated with heavy duty truck travel (material deliveries, solid waste collection from above-ground treatment facilities) on roadways within and outside the project area, emissions associated with diesel-powered equipment (e.g., forklifts, generators,) at the above-ground treatment facilities, as well as emissions associated with diesel-powered equipment (e.g., tractors, baler, cutter) for alfalfa plowing and harvesting. Section 3.5.5.3 describes the methodology for estimating health risk, specifically cancer risk for diesel exhaust.

Health risk impacts associated with the long-term operations of all alternatives are summarized in Table 3.5-1~~4~~5. Estimated health risk differs by alternative given the different levels of activity and potential emission sources. The health risk would be below the MDAQMD cancer risk threshold of 10 risks per million for all alternatives except for Alternative 4C-4,which includes substantially more agricultural activities. Thus, the impact would be less than significant for No Project and Alternatives 4B, 4C-2, 4C-3, and 4C-5. For Alternative 4C-4, the health risk would be in excess of the MDAQMD cancer risk threshold of 10 in a million; thus, the impact would be potentially significant. Implementation of **Mitigation Measure AIR-MM-5** would reduce impacts to less than significant.

## No Project Alternative

As described above, implementation of the No Project Alternative would result in health risks below the MDAQMD cancer risk threshold of 10 risks per million above existing conditions (Table 3.5-1~~4~~5). The No Project Alternative would result in a continuation of previously authorized activities, and would require only 6 ~~12~~ heavy-duty diesel truck round-trips (12 ~~24~~ one-way trips) per year, similar to ~~above~~ existing conditions. The impact would be less than significant, and no mitigation is required.

## Alternatives 4B, 4C-2, 4C-3, and 4C-5

As described above, implementation of Alternative 4B would result in health risks below the MDAQMD cancer risk threshold of 10 risks per million above existing conditions (Table 3.5-1~~4~~5). Alternative 4B would result in approximately 8 ~~18~~ heavy-duty diesel truck round-trips (16 ~~36~~ one-way trips) per year above existing conditions, as well as annual agricultural activities on 264 acres. No mitigation is required. This impact would be the same for Alternatives 4C-2, 4C-3, and 4C-5.

## Alternative 4C-4

As described above, implementation of Alternative 4C-4would result in health risks in excess of the MDAQMD cancer risk threshold of 10 risks per million (Table 3.5-1~~4~~5). Alternative 4C-4 would include 1,212 scaled acres of agricultural activities and 16 ~~40~~ annual truck round-trips. The vast majority of this impact is due to agricultural activities. Implementation of **Mitigation Measure AIR-MM-5**, which would require use of clean diesel equipment for agriculture land treatment activities, would reduce this to less than significant (Table 3.5-1~~5~~6).

**Table 3.5-14~~5~~. Estimated Unmitigated Health Risk from Diesel Particulate Matter for Project Alternatives**

| Alternative | Annual Diesel Activities | Cancer Risk Per Million: Truck Trips | Ex-Situ[a] Equipment | Agriculture Equipment | Total Risk |
|---|---|---|---|---|---|
| No Project | 12 ~~24~~ Ethanol Deliveries<br>0 New Acres of Agriculture | 0.002<br>~~0.004~~ | | | 0.002<br>~~0.004~~ |
| Alternative 4B | 16 ~~36~~ Ethanol Deliveries<br>264 New Acres of Agriculture | 0.002<br>~~0.006~~ | | 3.887 | 3.890<br>~~3.893~~ |
| Alternative 4C-2 | 16 ~~30~~ Ethanol Deliveries<br>393~~2~~ New Acres of Agriculture | 0.002<br>~~0.005~~ | | 4.721 | 4.723<br>~~4.725~~ |
| Alternative 4C-3 | 38 Ex-Situ Deliveries<br>16 ~~18~~ Ethanol Deliveries<br>38 Ex-Situ Waste Haul Trips<br>393~~2~~ New Acres of Agriculture<br>1,860 Gallons of Diesel Fuel for Ex-Situ Equipment | 0.014<br>~~0.015~~ | 3.349<br>~~3.292~~ | 4.721 | 8.084<br>~~8.027~~ |
| Alternative 4C-4 | 16 ~~40~~ Ethanol Deliveries<br>1,212 New Acres of Agriculture | 0.002<br>~~0.006~~ | | 10.059 | **10.062**<br>**~~10.065~~** |
| Alternative 4C-5 | 24 Ex-Situ Deliveries<br>16 ~~18~~ Ethanol Deliveries<br>24 Ex-Situ Waste Haul Trips<br>393~~2~~ New Acres of Agriculture<br>1,200 Gallons of Diesel Fuel for Ex-Situ Equipment | 0.010 | 2.159<br>~~2.123~~ | 4.721 | 6.890<br>~~6.854~~ |

Source: California Air Pollution Control Officers Association 2009; San Joaquin Valley Air Pollution Control District 2008; U.S. Environmental Protection Agency 2004; EMFAC 2011; URBEMIS2007; OFFROAD2007; ICF Emissions Modeling.

Cancer risks in excess of the MDAQMD threshold of 10 cases per million people (see Section 3.5.4) are shown in **bold**.

[a] Ex-situ refers to the above-ground treatment facility.

**Table 3.5-15~~6~~. Estimated Mitigated Health Risk from Diesel Particulate Matter for Project Alternatives**

| Alternative | Annual Diesel Activities | Cancer Risk Per Million | | | |
|---|---|---|---|---|---|
| | | Truck Trips | Ex-Situ[a] Equipment | Agriculture Equipment | Total Risk |
| No Project | 13 ~~24~~ Ethanol Deliveries<br>0 New Acres of Agriculture | NA | -- | -- | NA |
| Alternative 4B | 16 ~~36~~ Ethanol Deliveries<br>264 New Acres of Agriculture | NA | -- | NA | NA |
| Alternative 4C-2 | 16 ~~30~~ Ethanol Deliveries<br>393~~2~~ New Acres of Agriculture | NA | -- | NA | NA |
| Alternative 4C-3 | 38 Ex-Situ Deliveries<br>16 ~~18~~ Ethanol Deliveries<br>38 Ex-Situ Waste Haul Trips<br>393~~2~~ New Acres of Agriculture<br>1,860 Gallons of Diesel Fuel for Ex-Situ Equipment | NA | NA | NA | NA |
| Alternative 4C-4 | 16 ~~40~~ Ethanol Deliveries<br>1,212 New Acres of Agriculture | 0.002<br>~~0.006~~ | -- | 1.006 | 1.008<br>~~1.012~~ |
| Alternative 4C-5 | 24 Ex-Situ Deliveries<br>16 ~~18~~ Ethanol Deliveries<br>24 Ex-Situ Waste Haul Trips<br>393~~2~~ New Acres of Agriculture<br>1,200 Gallons of Diesel Fuel for Ex-Situ Equipment | NA | NA | NA | NA |

Source: California Air Pollution Control Officers Association 2009; San Joaquin Valley Air Pollution Control District 2008; U.S. Environmental Protection Agency 2004 ; EMFAC 2011; URBEMIS2007; OFFROAD 2007; ICF Emissions Modeling.

There are no ~~C~~cancer risks in excess of the MDAQMD threshold of 10 cases per million people (see Section 3.5.4)~~ are shown in **bold**~~.

[a] Ex-situ refers to the above-ground treatment facility.

## 3.5.6.3 Odors

**Impact AIR-3a: Create Objectionable Odors at Nearby Receptors during Construction (Less than Significant, All Alternatives)**

### Overview of Impact

For all alternatives, construction activities that could emit objectionable odors include diesel exhaust. Additionally for Alternatives 4C-3 and 4C-5, construction activities associated with the above-ground treatment facilities could emit odors from asphalt paving and the use of architectural coatings and solvents. Construction activities near existing receptors would be temporary in nature and would not likely result in nuisance odors that would violate MDAQMD Rule 402 or frequently expose the public to objectionable odors. Therefore, this impact is considered less than significant for all alternatives.

**Impact AIR-3b: Create Objectionable Odors at Nearby Receptors during Operation (Less than Significant, All Alternatives)**

### Overview of Impact

For all alternatives, operations and maintenance activities would include some minor odors associated with the injection of biological reductants. These are expected to be detectable only at the well head and would likely dissipate before reaching the nearest residence. There may also be some minor and temporary odors associated with the handling, storage, and operation of ethanol and methanol. The rural location of the remediation site and the distance to the nearest residences would prevent these potential conditions from affecting a substantial number of people (Lahontan Regional Water Quality Control Board 2006, 2007, 2008). Potential odors associated with diesel exhaust from ongoing deliveries, and the use of solvents would be limited to the circulation routes and parking areas. Note that agricultural activities associated with the Desert View Dairy would continue, but existing dairy operations themselves are not included in remediation activities and are thus not part of the proposed project (cow odors are part of the CEQA baseline). Brief exhaust odors from remedial actions are an adverse, but not significant, air quality impact. Therefore, this impact is considered less than significant for all alternatives.

## 3.5.6.4 GHG Emissions/Climate Change

**Impact AIR-4a: Generate GHG Emissions, Either Directly or Indirectly, That May Have a Significant Impact on the Environment or Conflict with the Goals of AB 32 (Less than Significant, No Project Alternative; Less than Significant with Mitigation, All Action Alternatives)**

### Overview of Impact

All alternatives could result in increased GHG emissions during construction and operation. Increased GHGs could make an incremental contribution to global climate change and the adverse global environmental effects thereof, as would most development projects occurring worldwide.

#### Construction

For all alternatives, short-term construction activities would result in GHG emissions from fuel combustion in off- and on-road construction equipment and vehicles. As summarized in Table 3.5-16~~7~~, short-term construction-related GHG emissions for the action alternatives would range from 6,000 to 9,700 ~~5,000 to 8,500~~ $MTCO_2e$. Although the action alternatives would have one-time emissions that exceed 3,000 $MTCO_2e$ during construction, the County's 3,000 $MTCO_2e$ trigger for mandating specific reduction amounts is for annual emissions over time. The initial construction period will be the most intense for all alternatives and construction emissions will be much smaller in later periods due to far more limited construction activities. When averaging the construction emissions over the 30 year (minimum) lifetime, of the project, construction emissions for all project alternatives would be well below the County's threshold. However, the action alternatives must comply with the San Bernardino County Greenhouse Gas Emissions Reduction Plan (December 2011), which requires implementation of GHG performance standards for new projects to ensure the individual and cumulative impacts for GHG emissions are less than significant.

The No Project Alternative was approved prior to adoption of the San Bernardino County GHG Emissions Reduction Plan and thus the mandatory performance standards do not apply. Construction emissions of the No Project Alternative would be less than the MDAQMD GHG thresholds. Thus, the No Project Alternative would have a less than significant impact on GHG emissions during construction.[2]

All the action alternatives require implementation of **Mitigation Measure AIR-MM-6** (construction GHG reduction standards from the County GHG Emissions Reduction Plan) to reduce potential impacts to a less-than-significant level for construction.

### Operations

All alternatives could result in increased GHG emissions from operation and maintenance. Increased GHG emissions would make an incremental contribution to global and the adverse global environmental effects thereof, as would most development projects occurring worldwide.

For all alternatives, ongoing maintenance and operations would result in GHG emissions from periodic agricultural plowing and harvesting, daily worker commutes, material delivery vehicle exhaust, and electricity consumption associated with the wells and associated infrastructure. Additionally, ongoing maintenance and operations for Alternatives 4C-3 and 4C-5, which also have above-ground treatment facilities, would include additional emissions from electricity consumption, material delivery, and waste haul trips, as well as equipment exhaust associated with treatment facility operations (forklifts, generators, etc.). Table 3.5-17~~8~~ presents long-term operations-related emissions for all alternatives compared to existing conditions.

The No Project Alternative was approved prior to adoption of the San Bernardino County GHG Emissions Reduction Plan and thus the mandatory performance standards do not apply. Operational emissions of the No Project Alternative would be less than the MDAQMD GHG thresholds. Thus, the No Project Alternative would have a less than significant impact on GHG emissions during construction.[3]

The San Bernardino County GHG Emissions Reduction Plan (December 2011) requires implementation of GHG performance standards for new projects to ensure the individual and cumulative impacts for GHG emissions are less than significant. All of the action alternatives~~, with the exception of Alternative 4C-3~~ have less than 3,000 $MTCO_2e$, and thus the County requirements for projects with less than 3,000 $MTCO_2e$ apply to all alternatives~~ other than Alternative 4C-3~~. If the GHG emissions for any alternative ~~Alternative 4C-3~~ are confirmed to be more than 3,000 $MTCO_2e$ per year, then it will be required to reduce these emissions by 31 percent in conformance with the County reduction plan requirements. All the action alternatives require implementation of **Mitigation Measure AIR-MM-7** to reduce potential impacts to a less-than-significant level for operations by mandating the County GHG performance standards relevant to this project from the County GHG Emissions Reduction Plan. Additionally, Alternatives 4C-3 and 4C-5, which include above-ground treatment facilities, require implementation of **Mitigation Measure AIR-MM-8** to reduce potential impacts to a less-than-significant level for operation.

[2] The MDAQMD threshold is much higher than that proposed and/or adopted by any other air district in the state. In order to be conservative, the No Project Alternative impacts were compared to the most stringent GHG threshold proposed and/or adopted by any air district in the state, which is the 1,100 MTCO2e previously proposed by the BAAQMD (but presently not adopted). The No Project Alternative's construction emissions are less than the BAAQMD previously proposed threshold.

[3] The No Project Alternative's operational emissions are also less than the BAAQMD's previously proposed threshold of 1,100 MTCO2e.

**Table 3.5-16~~7~~. Estimated Unmitigated Construction GHG Emissions for Project Alternatives (total metric tons)**

| | Before State Measures[a] | | | With State Measures | | |
|---|---|---|---|---|---|---|
| Phase | $CO_2$ | Other[b] | $CO_2e$ | $CO_2$ | Other | $CO_2e$ |
| No Project | 1,451 | 5 | 1,467 | NA | NA | NA |
| Alternative 4B | 6,039 | 66 | 6,105 | 5,966 | 64 | 6,029 |
| | ~~5,041~~ | ~~54~~ | ~~5,095~~ | ~~4,981~~ | ~~53~~ | ~~5,034~~ |
| Alternative 4C-2 | 6,068 | 66 | 6,133 | 5,990 | 64 | 6,054 |
| | ~~5,286~~ | ~~57~~ | ~~5,342~~ | ~~5,219~~ | ~~55~~ | ~~5,274~~ |
| Alternative 4C-3 | 8,947 | 163 | 9,110 | 8,828 | 159 | 8,987 |
| | ~~8,336~~ | ~~156~~ | ~~8,493~~ | ~~8,225~~ | ~~152~~ | ~~8,377~~ |
| Alternative 4C-4 | 8,383 | 91 | 8,474 | 8,147 | 82 | 8,230 |
| | ~~7,304~~ | ~~72~~ | ~~7,376~~ | ~~7,107~~ | ~~65~~ | ~~7,172~~ |
| Alternative 4C-5 | 7,858 | 131 | 7,989 | 7,743 | 128 | 7,871 |
| | ~~6,943~~ | ~~121~~ | ~~7,064~~ | ~~6,840~~ | ~~114~~ | ~~6,954~~ |

Source: URBEMIS 2007; EMFAC 2011; ICF Emissions Modeling.

[a] State measures include Pavley (on-road) and LCFS (both on- and off-road sources).

[b] Other GHGs include $CH_4$ and $N_2O$ and include global warming potential (GWP). See Appendix D for a definition of GWP.

The MDAQMD $CO_2e$ threshold is provided in Table 3.5-8.

**Table 3.5-17~~8~~. Estimated Unmitigated Operational GHG Emissions for Project Alternatives over Existing Conditions (metric tons per year)**

| | Before State Measures[a] | | | With State Measures | | |
|---|---|---|---|---|---|---|
| Phase | $CO_2$ | Other[b] | $CO_2e$ | $CO_2$ | Other | $CO_2e$ |
| No Project | 916 | 20 | 936 | NA | NA | NA |
| Alternative 4B | 1,560 | 34 | 1,595 | 1,197 | 32 | 1,229 |
| | ~~1,788~~ | ~~36~~ | ~~1,824~~ | ~~1,421~~ | ~~33~~ | ~~1,454~~ |
| Alternative 4C-2 | 1,636 | 36 | 1,672 | 1,261 | 33 | 1,294 |
| | ~~1,726~~ | ~~37~~ | ~~1,763~~ | ~~1,350~~ | ~~34~~ | ~~1,384~~ |
| Alternative 4C-3 | 2,790 | 54 | 2,848 | 2,266 | 51 | 2,320 |
| | ~~2,942~~ | ~~59~~ | ~~3,005~~ | ~~2,416~~ | ~~55~~ | ~~2,474~~ |
| Alternative 4C-4 | 2,183 | 46 | 2,229 | 1,720 | 43 | 1,763 |
| | ~~2,260~~ | ~~47~~ | ~~2,308~~ | ~~1,796~~ | ~~44~~ | ~~1,840~~ |
| Alternative 4C-5 | 1,856 | 36 | 1,894 | 1,482 | 33 | 1,518 |
| | ~~2,056~~ | ~~43~~ | ~~2,101~~ | ~~1,679~~ | ~~40~~ | ~~1,721~~ |

Source: URBEMIS 2007; EMFAC 2011; Climate Registry Information System 2012; The Climate Registry 2012; ICF Emissions Modeling.

[a] State measures include Pavley, LCFS, and California's Renewable Portfolio Standard (RPS).

[b] Other GHGs include $CH_4$, $N_2O$, and $SF_6$ and include GWP. See Appendix D for a definition of GWP.

The MDAQMD $CO_2e$ threshold is provided in Table 3.5-8. The San Bernardino County threshold is discussed in Section 3.5.3.2.

## No Project Alternative

As described above, implementation of the No Project Alternative would result in GHG emissions far below the MDAQMD threshold during both construction and operations (see Tables 3.5-1<u>6</u>~~7~~ and 3.5-1<u>7</u>~~8~~). Therefore, the impact would be less than significant, and no mitigation is required.

## Alternatives 4B, 4C-2, and 4C-4

As described above, implementation of Alternatives 4B, 4C-2, and 4C-4 would result in GHG emissions that do not exceed the MDAQMD threshold during both construction and operation (see Tables 3.5-1<u>6</u>~~7~~ and 3.5-1<u>7</u>~~8~~). However, the project may not comply with the San Bernardino County Greenhouse Gas Emissions Reduction Plan (December 2011) during both construction and operation. Implementation of **Mitigation Measures MM-AIR-6 and MM-AIR-7** would reduce this impact to a less-than-significant level by requiring the project to comply with the County's GHG Reduction Plan performance standards.

## Alternatives 4C-3 and 4C-5

As described above, implementation of Alternatives 4C-3 and 4C-5 would result in GHG emissions that do not exceed the MDAQMD threshold during both construction and operation (see Tables 3.5-1<u>6</u>~~7~~ and 3.5-1<u>7</u>~~8~~). However, the project may not comply with the San Bernardino County Greenhouse Gas Emissions Reduction Plan (December 2011) during both construction and operation. Implementation of **Mitigation Measures AIR-MM-6, AIR-MM-7,** and **AIR-MM-8** would reduce this impact to a less-than-significant level by requiring the project to comply with the County's GHG Reduction Plan performance standards.

**Impact AIR-4b: Expose Property or Persons to the Physical Effects of Climate Change (Less than Significant, All Alternatives)**

There is a wide range of potential effects of climate change that could occur in California, only some of which may affect the Hinkley area.

Some of the potential effects of climate change in the Mojave Desert could include an increase in temperature, heat stress days, change in precipitation duration and timing including storm intensity, increase in potential for wildfires, change in water supplies (where imported from snowmelt sources), changes in crop pests, and degradation of air quality (due to increased temperatures which favor ozone formation). Given its inland location, sea level rise is not an issue for the Mojave Desert.

This project has a long timeframe as all action alternatives would have operations that would continue until average background levels of Cr[VI] are met (currently estimate as 1.2 ppb), which could take 75 to 95 years, depending on alternative. Using the Cal-Adapt resource (cal-adapt.org, 2012), projected temperature increases in the Hinkley Area from climate change could range from 4.3 to 7.4 degrees Fahrenheit depending on future emissions scenarios, regardless if the project is implemented.

The wildfire risk at the site is low due to the limited vegetation in the Hinkley Valley and adjacent areas and the project would not substantially increase wildfire risk with compliance with the County's Fire Code (see Section 3.3, *Hazards and Hazardous Materials*) even if the wildfire risk were to increase with rising temperatures. The Cal-Adapt Resource identifies that fire risk relative to

2010 levels could be virtually the same in 2085 regardless of emissions scenarios (cal-adapt.org, 2012).

The potential effect of changes in precipitation and temperature on local groundwater supply are not well understood at this time, as local downscaling analysis (i.e., using global climate change models to derive local outputs) of climate change effects on hydrological cycles has not been done for the Mojave Desert at a scale that would allow an estimate of potential future changes in local water supply. Thus, it cannot be known at this time whether future groundwater conditions will be more constrained or less constrained in the future compared to existing conditions. As discussed in Section 3.1, *Water Resources and Water Quality*, the project will be required to obtain additional water rights and supplies to support proposed agricultural treatment. Depending on local temperature changes, it is possible that the water demand for agricultural treatment could increase with higher temperatures resultant from climate change. However, mitigation identified in Section 3.1 would require PG&E to obtain water rights for all remedial proposed increases in water use and to provide replacement water where remedial activities affect domestic and agricultural wells. Thus, if groundwater conditions change over time, PG&E will still be responsible to mitigate any of its significant contributions to impacts on water supplies.

As described in Section 3.1, *Water Resources and Water Quality*, the project would not have a significant effect related to flooding or drainage and thus if future flooding conditions are different due to climate change, the project would still not have a significant effect.

As discussed in this section, the project would have a less than significant operational impact on criteria pollutants and air quality with mitigation for dust control. If temperature increases worsen the air quality in the Mojave Desert, the project would still not substantially contribute to worsened air quality because emissions are less than MDAQMD thresholds for criteria pollutants other than PM10 (and PM10 emissions would be mitigated as noted above).

There are a range of other potential effects of climate change to which the project area under all alternatives may be subject, including increased heat stress days, for example. However, the actions associated with all alternatives would not exacerbate those potential effects nor create a particular hazard to those potential effects.

Thus, implementation of all alternatives would thus not result in a significant exposure of property or persons to the potential effects of climate change. This impact is considered to be less than significant for all alternatives.

## 3.5.7 Mitigation Measures

**Mitigation Measure AIR-MM-1: Utilize Clean Diesel-Powered Equipment during Construction**

PG&E or their contractor will ensure that all off-road diesel-powered equipment used during construction will be equipped with an EPA Tier 4 Final or cleaner engine, except for specialized construction equipment in which an EPA Tier 4 engine is not available. This will achieve the emission reductions compared to an average Tier 2 engine shown in Table 3.5-1~~8~~9 (South Coast Air Quality Management District 2010). For purposes of a conservative analysis, mitigated reductions assume the lowest of the $NO_X$ Final (93%), reactive organic gases (42%), and particulate matter (90%) reductions applied to all off-road equipment. Note that Tier 4

standards for carbon monoxide are unchanged from Tier 2. Therefore, there will be no carbon monoxide reductions associated with Tier 4 standards herein.

**Table 3.5-189. Off-Road Engine Emission Rates, Percent Reductions from Tier 2 to Tier 4 Interim and Tier 4 Final Engines**

| Engine Size (horsepower) | Percent Emissions Reduction Tier 2 to Tier 4 Interim and Tier 4 Final | | | |
|---|---|---|---|---|
| | $NO_X$ (Interim) | $NO_X$ (Final) | ROG | PM |
| 75–99 | 53 | 94 | 50 | 95 |
| 100–174 | 46 | 94 | 43 | 93 |
| 175–299 | 68 | 94 | 43 | *90* |
| 300–600 | 67 | *93* | *42* | *90* |

Source: South Coast Air Quality Management District 2010.

*Italic* values indicate the percent reductions assumed in the mitigated analysis.

Note that the off-road engine reductions shown herein are summarized by SCAQMD, but are based on ARB and EPA standards for diesel equipment. Therefore, while the proposed project area is not within SCAQMD jurisdiction, the reductions herein are applicable to the proposed project alternatives.

**Mitigation Measure AIR-MM-2: Ensure Fleet Modernization for On-Road Material Delivery and Haul Trucks during Construction**

PG&E or its contractor will ensure that all on-road heavy-duty diesel trucks used during construction with a gross vehicle weight rating (GVWR) 19,500 pounds or greater, including those for all material deliveries and soil hauling, will comply with EPA 2007 on-road emission standards for PM10 and $NO_X$ (0.01 grams per brake horsepower-hour [g/bhp-hr] and 0.20 g/bhp-hr, respectively).

The above EPA Standards measures will be met, unless one of the following circumstances exists, and the contractor is able to provide proof that any of these circumstances exists:

- A piece of specialized equipment is unavailable in a controlled form within the state of California, including through a leasing agreement. ("Controlled form" refers to an equipment piece that has emission-control technology included.)
- A contractor has applied for necessary incentive funds to put controls on a piece of uncontrolled equipment planned for use on the proposed project, but the application is not yet approved, or the application has been approved, but funds are not yet available.
- A contractor has ordered a control device for a piece of equipment planned for use on the proposed project, or the contractor has ordered a new piece of controlled equipment to replace the uncontrolled equipment, but that order has not been completed by the manufacturer or dealer. In addition, for this exemption to apply, the contractor must attempt to lease controlled equipment to avoid using uncontrolled equipment, but no dealer within 200 miles of the proposed project has the controlled equipment available for lease.

**Mitigation Measure AIR-MM-3: Implement Emission-Reduction Measures during Construction**

PG&E or its contractor will include the following emission-reducing measures in the construction specifications to ensure implementation during construction.

- ~~PG&E or its contractor will implement the following measures during project construction.~~ Haul and delivery truck idling times will be minimized either by shutting equipment off when not in use or reducing the maximum idling time to less than 3 minutes (greater than that required by the California airborne toxics control measure, 13 CCR 2485). Clear signage will be provided for construction workers at all access points.
- All construction equipment will be maintained and properly tuned in accordance with manufacturer's specifications. All equipment will be checked by a certified mechanic and determined to be running in proper condition prior to operation.

~~These measures will be included in the construction specifications. PG&E will hire a third party monitor to periodically inspect construction equipment and practices to ensure compliance.~~

**Mitigation Measure AIR-MM-4: Implement Dust Control Measures during Construction and Operations**

PG&E or its contractor will include ~~or implement~~ the following dust control measures per MDAQMD Rule 403.2 in the construction specifications to ensure implementation during construction and in the Operations & Maintenance manual to ensure implementation during operation.

- Use periodic watering for short-term stabilization of disturbed surface area to minimize visible fugitive dust emissions. For purposes of this rule, use of a water truck to maintain moist disturbed surfaces and actively spread water during visible dusting episodes will be considered sufficient to maintain compliance.
- Take actions sufficient to prevent project-related trackout onto paved surfaces.
- Cover loaded haul vehicles while operating on publicly maintained paved surfaces.
- Stabilize graded site surfaces upon completion of grading when subsequent development is delayed or expected to be delayed more than 30 days, except when such a delay is attributable to precipitation that dampens the disturbed surface sufficiently to eliminate visible fugitive dust emissions.
- Cleanup project-related trackout or spills on publicly maintained paved surfaces within 24 hours.
- Reduce nonessential earth-moving activity under high wind conditions. For purposes of this rule, a reduction in earth-moving activity when visible dusting occurs from moist and dry surfaces from wind erosion will be considered sufficient to maintain compliance.

Additionally, projects disturbing more than 100 acres per day will comply with the following rules.

- Prepare and submit to the MDAQMD, prior to commencing earth-moving activity, a dust control plan that describes all applicable dust control measures that will be implemented at the project. With respect to the proposed project, it was assumed that specific dust control

measures would include limiting travel speeds to 15 miles per hour on unpaved roads, watering exposed surfaces three times daily, and applying soil stabilizers to inactive areas.

- Provide stabilized access route(s) to the project site as soon as is feasible. For purposes of this rule, as soon as is feasible will mean prior to the completion of construction/demolition activity.
- Maintain natural topography to the extent possible.
- Construct parking lots and paved roads first, where feasible.
- Construct upwind portions of project first, where feasible.

~~These measures will be included in the construction specifications. PG&E will hire a third party monitor to periodically inspect construction equipment and practices to ensure compliance.~~

**Mitigation Measure AIR-MM-5: Utilize Clean Diesel-Powered Equipment for Operation of Agricultural Treatment and Above-Ground Treatment Facilities**

PG&E or its contractor will ensure that all off-road diesel-powered equipment used during operations of the above-ground treatment facility (Alternatives 4C-3 and 4C-5 only) and agricultural land treatment (all action alternatives) will be equipped with an EPA Tier 4 Interim or Final or cleaner engine, except for specialized construction equipment in which an EPA Tier 4 engine is not available. This will be included in the construction specifications.

~~PG&E will hire a third party monitor to periodically inspect equipment during operation to ensure compliance.~~

**Mitigation Measure AIR-MM-6: Implement San Bernardino County GHG Construction Standards during Construction**

PG&E or its contractor will submit ~~for review and obtain approval from County Planning or~~ a signed letter to San Bernardino County and the Water Board agreeing to include as a condition of all construction contracts/subcontracts requirements to reduce GHG emissions and submit~~ting~~ documentation of results ~~compliance~~. PG&E or its contractor will do the following:

- Implement a County-approved Coating Restriction Plan.
- Select construction equipment based on low GHG emissions factors and high-energy efficiency. Where feasible, diesel-/gasoline-powered construction equipment will be replaced, with equivalent electric or compressed natural gas (CNG) equipment.
- Because it may not be feasible to use electric or CNG equipment per the County performance standard, the project will use biodiesel fuel if the following applies:
  - Biodiesel fuel becomes available within 20 miles of the project site.
  - The California Air Resources Board has certified that the locally available biodiesel results in reduction of GHG emissions.
  - Biodiesel fuel is approved by the manufacturer for use in diesel trucks or equipment used for remedial activities, including farm equipment and construction equipment.
  - The cost of biodiesel is not more than 125% above the price of regular diesel fuel, then

  - As biodiesel comes in blended amounts (B5 = 5% biodiesel; B20 = 20% biodiesel; B100 = 100% biodiesel), PG&E will use the highest biodiesel blend that is approved for use in site trucks or equipment, available, and within the price limitation noted above.

- Grading contractor will implement the following when possible:
  - Training operators to use equipment more efficiently.
  - Identifying the proper size equipment for a task can also provide fuel savings and associated reductions in GHG emissions.
  - Replacing older, less fuel-efficient equipment with newer models.
  - Using global positioning system (GPS) for grading to maximize efficiency.
- Grading plans will include the following statements:
  - "All construction equipment engines will be properly tuned and maintained in accordance with the manufacturers specifications prior to arriving on site and throughout construction duration."
  - "All construction equipment (including electric generators) will be shut off by work crews when not in use and will not idle for more than 5 minutes."
- Recycle and reuse construction and demolition waste (e.g., soil, vegetation, concrete, lumber, metal, and cardboard) per County Solid Waste procedures.
- Educate all construction workers about the required waste reduction and the availability of recycling services.

PG&E or its contractor will submit for review and obtain approval from County Planning of evidence that all applicable GHG performance standards have been installed and implemented properly, and that specified performance objectives are being met to the satisfaction of County Planning and County Building and Safety.

**Mitigation Measure AIR-MM-7: Implement San Bernardino County GHG Operational Standards for Operations**

PG&E or its contractor will implement the following as GHG mitigation during the operation of the approved project.

- Waste Stream Reduction. PG&E will provide to all employees County-approved informational materials about methods and the need to reduce the solid waste stream, with a list of available recycling services. The education and publicity materials/program will be submitted to County Planning for review and approval.
- Landscape Equipment. If landscaping is added for the above-ground treatment facilities, PG&E will require that a minimum of 20% of the landscape maintenance equipment will be electric-powered.
- Biodiesel Fuel. Because there are limited to no options to reduce vehicle emissions given the remote location of the site, PG&E will use biodiesel in operations when the following conditions apply as an alternative means to reduce GHG emissions:
  - Biodiesel fuel becomes available within 20 miles of the project site.

- The California Air Resources Board has certified that the locally available biodiesel results in reduction of GHG emissions.
- Biodiesel fuel is approved by the manufacturer for use in diesel trucks or equipment used for remedial activities, including farm equipment and construction equipment.
- The cost of biodiesel is not more than 125% above the price of regular diesel fuel, then
- As biodiesel comes in blended amounts (B5 = 5% biodiesel; B20 = 20% biodiesel; B100 = 100% biodiesel), PG&E will use the highest biodiesel blend that is approved for use in site trucks or equipment, available, and within the price limitation noted above.

PG&E will submit for review and obtain approval from the San Bernardino County Planning Department of evidence that all applicable GHG performance standards are being employed, and that specified performance objectives are being met to the satisfaction of County Planning and County Building and Safety.

**Mitigation Measure AIR-MM-8: Implement San Bernardino County GHG Design Standards**

PG&E will submit for review and obtain approval from County Planning that the following measures have been incorporated into the design of the project, as applicable. These are intended to reduce potential project GHGs emissions. Proper installation of the approved design features and equipment will be confirmed by County Building and Safety prior to final inspection of each structure.

1. Title 24 + 5%. PG&E will document that the design of the proposed above-ground treatment structures exceed the current Title 24 energy-efficiency requirements by a minimum of 5%. County Planning will coordinate this review with County Building and Safety. Any combination of the following design features may be used to fulfill this mitigation, provided that the total increase in efficiency meets or exceeds the cumulative goal (105%+ of Title 24) for the entire project (Title 24, Part 6 of the California Code of Regulations; Energy Efficiency Standards for Residential and Non Residential Buildings, as amended October 1, 2005; Cool Roof Coatings performance standards as amended September 11, 2006):
    a. Incorporate dual paned or other energy efficient windows.
    b. Incorporate energy efficient space heating and cooling equipment.
    c. Incorporate energy efficient light fixtures, photocells, and motion detectors.
    d. Incorporate energy efficient appliances.
    e. Incorporate solar panels into the electrical system.
    f. Incorporate cool roofs/light colored roofing.
    g. Incorporate other measures that will increase energy efficiency.
    h. Increase insulation to reduce heat transfer and thermal bridging.
    i. Limit air leakage throughout the structure and within the heating and cooling distribution system to minimize energy consumption.
2. Plumbing. All plumbing will incorporate the following:
    a. All showerheads, lavatory faucets, and sink faucets will comply with the California Energy Conservation flow rate standards.

b. Low flush toilets will be installed where applicable as specified in California State Health and Safety Code Section 17921.3.

c. All hot water piping and storage tanks will be insulated. Energy efficient boilers will be used.

3. Lighting. Lighting design for building interiors will support the use of the following:

   a. Compact fluorescent light bulbs or equivalently efficient lighting.

   b. Natural day lighting through site orientation and the use of reflected light.

   c. Skylight/roof window systems.

   d. Light colored building materials and finishes that reflect natural and artificial light with greater efficiency and less glare.

   e. A multi-zone programmable dimming system to control lighting and maximize the energy efficiency of lighting requirements at various times of the day.

   f. Onsite solar panels that provide a minimum of 2.5% of the project's electricity needs.

4. Building Design. Building design and construction will incorporate the following elements:

   a. Orient building locations to best utilize natural cooling/heating with respect to the sun and prevailing winds/natural convection to take advantage of shade, day lighting, and natural cooling opportunities.

   b. Utilize natural, low maintenance building materials that do not require finishes and regular maintenance.

   c. Install roofing materials that have a solar reflectance index of 78 or greater.

   d. Seal and leak test all supply duct work. Use oval or round ducts for at least 75% of the supply duct work, excluding risers.

   e. Install Energy Star or equivalent appliances.

   f. Control heating, vent, and air conditioning units with a building automation system that includes outdoor temperature/humidity sensors.

5. Landscaping. If landscaping is used at the above-ground treatment facilities, PG&E will submit for review and obtain approval from County Planning landscape and irrigation plans that are designed to include drought tolerant and smog tolerant trees, shrubs, and groundcover to ensure their long-term viability and to conserve water and energy. If the above-ground treatment facilities are heated or cooled, then the landscape plans will include shade trees around main buildings, particularly along southern and western elevations, if practical.

6. Irrigation. PG&E will limit irrigation used for agricultural treatment to the minimum necessary to support remedial action.

7. Recycling. Exterior storage areas for recyclables and green waste will be provided. Where recycling pickup is available, adequate recycling containers will be located in public areas. Construction and operation waste will be collected for reuse and recycling.

PG&E will work with ~~submit for review and obtain approval from~~ County Planning and submit any required reports for ~~of~~ evidence that all applicable GHG performance standards have been installed and implemented properly, and that specified performance objectives are being met to the satisfaction of County Planning and County Building and Safety.

If any alternative ~~Alternative 4C-3~~ is confirmed to be more than 3,000 $MTCO_2e$ per year, then instead of the requirements above in Mitigation Measure AIR-MM-7 and the requirements described above, ~~then~~ PG&E will be responsible to reduce emissions by at least 31 percent. In this case, PG&E will work with ~~submit for review and obtain approval from~~ County Planning and submit any required ~~of~~ evidence that emissions will be reduced by required amounts, anticipated to be a minimum of 31 percent ~~by a project-specific reduction plan. PG&E may use the County's screening table if applicable or may conduct its own calculations of reductions, provided the County concurs that the project plan will reduce GHG emission by a total of 31 percent.~~

# Section 3.6
# Noise

# 3.6 Noise

## 3.6.1 Introduction

This section describes the affected environment and regulatory setting for noise. It also describes the noise and vibration impacts that would result from implementation of the project and mitigation measures that would reduce those impacts. Growth-inducing and cumulative impacts are discussed separately in Chapter 4, *Other CEQA Analyses*.

Following is a summary of the impacts and background information on noise and vibration relevant to the noise analysis.

### 3.6.1.1 Summary of Impacts

Table 3.6-1 presents a summary of noise and vibration impacts. Section 3.6.6, *Impacts*, and Section 3.6.7, *Mitigation Measures*, provide detailed impact analysis and describe applicable mitigation measures for those impacts found to be potentially significant.

**Table 3.6-1. Summary of Noise Impacts**

| Impact | Applicable Alternative | Significance before Mitigation | Mitigation Measures | Significance after Mitigation |
|---|---|---|---|---|
| NOI-1a: Exposure of Noise-Sensitive Land Uses to Excessive Construction Noise | No Project | Less than Significant | None Required | -- |
| | All Action Alternatives | Potentially Significant | ~~MM-~~NOI-MM-1: Prepare a Noise/Vibration Control Plan and Employ Noise/ Vibration-Reducing Construction Practices to Comply with County Noise Standards | Less than Significant |
| NOI-1b: Exposure of Noise-Sensitive Land Uses to Excessive Ground Vibration from Construction Activities | All Alternatives | Potentially Significant | ~~MM-~~NOI-MM-1 | Less than Significant |
| NOI-2: Exposure of Noise-Sensitive Land Uses to Excessive Noise from Remediation Operations | All Alternatives | Less than Significant | None Required | -- |

As discussed in the impact analysis, the primary noise impacts are related to construction activity. Construction noise impacts could be significant if construction activities occur during nighttime hours when construction is not exempt from the County noise ordinance. Construction vibration

impacts could also be significant where drilling is conducted immediately adjacent to residences. Mitigation has been identified to reduce significant impacts to a less-than-significant level.

### 3.6.1.2 Background Information on Noise and Vibration

#### Noise

Noise is commonly defined as unwanted sound that annoys or disturbs people and potentially causes an adverse psychological or physiological effect on human health. Because noise is an environmental pollutant that can interfere with human activities, evaluation of noise is necessary when considering the environmental impacts of a proposed project.

Sound is mechanical energy (vibration) transmitted by pressure waves over a medium such as air or water. ~~Noise is generally defined as unwanted sound that annoys or disturbs people.~~ Sound is characterized by various parameters, including the rate of oscillation of the sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level is the most common descriptor used to characterize the loudness of an ambient (existing) sound level. Although the decibel (dB) scale, a logarithmic scale, is used to quantify sound intensity, it does not accurately describe how sound intensity is perceived by human hearing. The human ear is not equally sensitive to all frequencies in the entire spectrum; noise measurements are weighted more heavily for frequencies to which humans are sensitive in a process called *A-weighting*, written as dBA and referred to as *A-weighted decibels*. Table 3.6-2 provides definitions of sound measurements and other terminology used in this section, and Table 3.6-3 summarizes typical A-weighted sound levels for different noise sources.

**Table 3.6-2. Definition of Sound Measurements**

| Sound Measurements | Definition |
|---|---|
| Decibel (dB) | A unitless measure of sound on a logarithmic scale, which indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 micro-pascals. |
| A-Weighted Decibel (dBA) | An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear. |
| Maximum Sound Level ($L_{max}$) | The maximum sound level measured during the measurement period. |
| Minimum Sound Level ($L_{min}$) | The minimum sound level measured during the measurement period. |
| Equivalent Sound Level ($L_{eq}$) | The equivalent steady-state sound level that, in a stated period of time, would contain the same acoustical energy. |
| Percentile-Exceeded Sound Level ($L_{xx}$) | The sound level exceeded "x"% of a specific time period. $L_{10}$ is the sound level exceeded 10% of the time. |
| Day-Night Level ($L_{dn}$) or (DNL) | The energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring during the period from 10 p.m. to 7 a.m. |
| Community Noise Equivalent Level (CNEL) | The energy average of the A-weighted sound levels occurring during a 24-hour period, with 5 dB added to the A-weighted sound levels occurring during the period from 7 p.m. to 10 p.m. and 10 dB added to the A-weighted sound levels occurring during the period from 10 p.m. to 7 a.m. |
| Peak Particle Velocity (Peak Velocity or PPV) | A measurement of ground vibration defined as the maximum speed (measured in inches per second) at which a particle in the ground is moving relative to its inactive state. PPV is usually expressed in inches per second. |
| Frequency: Hertz (Hz) | The number of complete pressure fluctuations per second above and below atmospheric pressure. |

**Table 3.6-3. Typical A-Weighted Sound Levels**

| Common Outdoor Activities | Noise Level (dBA) | Common Indoor Activities |
|---|---|---|
| | 110 | Rock band |
| Jet flyover at 1,000 feet | | |
| | 100 | |
| Gas lawnmower at 3 feet | | |
| | 90 | |
| Diesel truck at 50 feet at 50 mph | | Food blender at 3 feet |
| | 80 | Garbage disposal at 3 feet |
| Noisy urban area, daytime | | |
| Gas lawnmower, 100 feet | 70 | Vacuum cleaner at 10 feet |
| Commercial area | | Normal speech at 3 feet |
| Heavy traffic at 300 feet | 60 | |
| | | Large business office |
| Quiet urban daytime | 50 | Dishwasher in next room |
| Quiet urban nighttime | 40 | Theater, large conference room (background) |
| Quiet suburban nighttime | | |
| | 30 | Library |
| Quiet rural nighttime | | Bedroom at night, concert hall (background) |
| | 20 | |
| | | Broadcast/recording studio |
| | 10 | |
| | 0 | |

Source: California Department of Transportation 2009.

In general, human sound perception is such that a change in sound level of 1 dB typically cannot be perceived by the human ear, a change of 3 dB is just noticeable, a change of 5 dB is clearly noticeable, and a change of 10 dB is perceived as doubling or halving the sound level.

Different types of measurements are used to characterize the time-varying nature of sound. These measurements include the equivalent sound level ($L_{eq}$), the minimum and maximum sound levels ($L_{min}$ and $L_{max}$), percentile-exceeded sound levels (such as $L_{10}$, $L_{20}$), the day-night sound level ($L_{dn}$), and the community noise equivalent level (CNEL). $L_{dn}$ and CNEL values differ by less than 1 dB. As a matter of practice, $L_{dn}$ and CNEL values are considered to be equivalent and are treated as such in this assessment.

For a point source such as a stationary compressor or construction equipment, sound attenuates at rate of 6 dB per doubling of distance. For a line source such as free-flowing traffic on a freeway, sound attenuates at a rate of 3 dB per doubling of distance (California Department of Transportation 2009). Atmospheric conditions, including wind, temperature gradients, and humidity, can change how sound propagates over distance and can affect the level of sound received at a given location. The degree to which the ground surface absorbs acoustical energy also affects sound propagation. Sound that travels over an acoustically absorptive surface such as grass attenuates at a greater rate

than sound that travels over a hard surface such as pavement. The increased attenuation is typically in the range of 1 to 2 dB per doubling of distance. Barriers such as buildings and topography that block the line of sight between a source and receiver also increase the attenuation of sound over distance.

## Vibration

Operation of heavy construction equipment, particularly pile driving and other impact devices such as pavement breakers, create seismic waves that radiate along the surface of the earth and downward into the earth. These surface waves can be felt as ground vibration. Vibration from operation of this equipment can result in effects ranging from annoyance of people to damage of structures (see Table 3.6-4). Varying geology and distance will result in different vibration levels, with different frequencies and displacements. In all cases, vibration amplitudes will decrease with increasing distance.

**Table 3.6-4. Guideline Vibration Annoyance Potential Criteria**

| | Maximum PPV (in/sec) | |
|---|---|---|
| Human Response | Transient Sources | Continuous/Frequent Intermittent Sources |
| Barely perceptible | 0.04 | 0.01 |
| Distinctly perceptible | 0.25 | 0.04 |
| Strongly perceptible | 0.9 | 0.10 |
| Severe | 2.0 | 0.4 |

Source: California Department of Transportation 2004.

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat (road re-surfacing) equipment, vibratory pile drivers, and vibratory compaction equipment.

Perceptible groundborne vibration generally is limited to areas within a few hundred feet of construction activities. Seismic waves traveling outward from a vibration source excite the particles of rock and soil through which they pass and cause them to oscillate. The actual distance that these particles move is usually only a few ten-thousandths to a few thousandths of an inch. The rate or velocity (in inches per second) at which these particles move is the commonly accepted descriptor of the vibration amplitude, referred to as the peak particle velocity (PPV).

Table 3.6-5 summarizes typical vibration levels generated by construction equipment (Federal Transit Administration 2006).

**Table 3.6-5. Vibration Source Levels for Construction Equipment**

| Equipment | PPV at 25 feet | Annoyance Potential[a] |
|---|---|---|
| Pile driver (impact) | 0.644 to 1.518 | Severe |
| Pile driver (sonic/vibratory) | 0.170 to 0.734 | Strongly perceptible to severe |
| Vibratory roller | 0.210 | Strongly perceptible to severe |
| Hoe ram | 0.089 | Distinctly to strongly perceptible |
| Large bulldozer | 0.089 | Distinctly to strongly perceptible |
| Caisson drilling | 0.089 | Distinctly to strongly perceptible |
| Loaded truck | 0.076 | Distinctly to strongly perceptible |
| Jackhammer | 0.035 | Barely to distinctly perceptible |
| Small bulldozer | 0.003 | Barely to distinctly perceptible |

Source: Federal Transit Administration 2006.

[a] Refer to Table 3.6-4, *Guideline Annoyance Vibration Potential Criteria*

Vibration amplitude attenuates over distance and is a complex function of how energy is imparted into the ground and the soil conditions through which the vibration is traveling.

Table 3.6-6 summarizes guideline vibration damage potential criteria suggested by the California Department of Transportation (Caltrans) (California Department of Transportation 2004).

**Table 3.6-6 Guideline Vibration Damage Potential Criteria**

| | Maximum PPV (in/sec) | |
|---|---|---|
| Structure and Condition | Transient Sources | Continuous/ Frequent Intermittent Sources |
| Extremely fragile historic buildings, ruins, ancient monuments | 0.12 | 0.08 |
| Fragile buildings | 0.2 | 0.1 |
| Historic and some old buildings | 0.5 | 0.25 |
| Older residential structures | 0.5 | 0.3 |
| New residential structures | 1.0 | 0.5 |
| Modern industrial/commercial buildings | 2.0 | 0.5 |

Source: California Department of Transportation 2004.

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

# 3.6.2 Regulatory Setting

## 3.6.2.1 Federal Regulations

There are no federal noise standards that are applicable to the proposed project.

## 3.6.2.2 State Regulations

There are no state noise standards that are applicable to the proposed project.

## 3.6.2.3 Local Regulations

### San Bernardino County Development Code

Section 83.01.080 of the San Bernardino County Development Code sets forth performance standards for land uses affected by stationary and mobile sources during daytime (7 a.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) periods. Exemptions to these standards include motor vehicles not under the control of an industrial use; emergency equipment, vehicles, and devices; and temporary construction and repair or demolition activities taking place between the hours of 7 a.m. and 7 p.m. Monday through Saturday, excluding federal holidays. Table 3.6-7 summarizes noise standards for stationary sources. These standards are adjusted upward for sources that occur for less than 1 hour. Stationary sources associated with the proposed project would typically occur for more than 1 hour. Therefore, these adjustments will not be applied in this assessment. Table 3.6-8 summarizes noise standards for mobile sources.

**Table 3.6-7. Noise Standards for Stationary Noise Sources**

| Affected Land Uses (Receiving Noise) | 7 a.m. to 10 p.m. $L_{eq}$ | 10 p.m. to 7 a.m. $L_{eq}$ |
|---|---|---|
| Residential | 55 dBA | 45 dBA |
| Professional Services | 55 dBA | 55 dBA |
| Other Commercial | 60 dBA | 60 dBA |
| Industrial | 70 dBA | 70 dBA |

Source: San Bernardino County 2007b.

Section 83.01.090 of the San Bernardino County Development Code addresses vibration. A violation of the code occurs if ground vibration can be felt at or beyond a lot line or if a ground vibration source produces a particle velocity greater than or equal to 0.2 inch per second measured at or beyond a lot line. Temporary construction, maintenance, repair, and demolition activities that occur between 7 a.m. and 7 p.m., except Sundays and federal holidays, are exempt from this requirement.

**Table 3.6-8. Noise Standards for Mobile Noise Sources**

| Land Use | | $L_{dn}$ (or CNEL) dBA | |
|---|---|---|---|
| Categories: | Uses: | Interior[a] | Exterior[b] |
| Residential | Single- or multi-family unit, duplex, mobile home | 45 | 60[c] |
| Commercial | Hotel, motel, transient housing | 45 | 60[c] |
| | Commercial retail, bank, restaurant | 50 | N/A |
| | Office building, research and development facility, professional office | 45 | 65 |
| | Amphitheater, concert hall, auditorium, movie theater | 45 | N/A |
| Industrial/Public | Hospital, nursing home, school classroom, religious institution, library | 45 | 65 |
| Open Space | Park | N/A | 65 |

Notes:

[a] The indoor environment excludes bathrooms, kitchens, toilets, closets, and corridors.

[b] The outdoor environment is limited to:

- Hospital/office building patios
- Hotel and motel recreation areas
- Mobile home parks
- Multi-family private patios or balconies
- Park picnic areas
- Private yard of single-family dwellings
- School playgrounds

[c] Exterior noise level of up to 65 dBA (or CNEL) will be allowed provided exterior noise levels have been substantially mitigated through a reasonable application of the best available noise reduction technology and interior noise exposure does not exceed 45 dBA (or CNEL) with windows and doors closed. Requiring windows and doors to be closed to achieve an acceptable interior noise level will necessitate the use of air conditioning or mechanical ventilation.

## San Bernardino County General Plan Noise Element

The purpose of the San Bernardino County General Plan (2007a) Noise Element is to limit the exposure of the community to excessive noise levels. The Noise Element is used to guide decisions concerning land use and the location of new roads and transit facilities, which are common sources of excessive noise.

- **Policy N 1.1** This policy designates areas in San Bernardino County as "noise impacted" if they are exposed to existing or projected future exterior noise levels from mobile or stationary sources exceeding the standards.

Developed land uses located within several hundred feet of SR 58 are exposed to noise in excess of 60 $L_{dn}$ and are considered to be "noise impacted."

## 3.6.3 Environmental Setting

This section discusses the existing noise conditions in the project area or in the vicinity.

### 3.6.3.1 Existing Land Uses

The project area is located in the Desert Region of San Bernardino County, north of the Mojave River and ~~south~~west of Mount General, along SR 58 (Figures 2-1 and 2-2a). As described in Section 3.2, *Land Use, Agriculture, Population and Housing*, most of the area is zoned Agricultural, Agricultural Preserve, and Rural Living. The project area is a predominantly rural community, consisting of rural residences, farmland, ranchland, federal land, roadways (including SR 58), a railroad (BNSF), a utility corridor for a major natural gas pipeline, and limited businesses. The primary land uses in the project area are associated with operation of the Hinkley Compressor Station, agricultural treatment activities at the Desert View Dairy (both owned by PG&E), and other privately owned agricultural properties. The Compressor Station is located in the southern portion of the project area, and the Desert View Dairy and the other existing agricultural treatment units are located in the central portion of the project area (Figure 2-2e). Between the Compressor Station and the Desert View Diary, most PG&E-owned land is vacant.

### 3.6.3.2 Existing Noise Levels

A dominant source of existing noise levels is traffic on SR 58. Trains on the BNSF track are an occasional source of noise as are agricultural activities. As part of the San Bernardino County General Plan update, a noise background report was prepared in 2005 to characterize existing noise conditions in the County. In the rural setting of the project area, these measured noise levels are considered to be representative of current noise conditions. Minimum hourly $L_{eq}$ values measured in the Desert Region were in the range of 36 to 56 dBA. Measured $L_{dn}$ values were in the range of 50 to 68 dBA (San Bernardino County 2005).

Table 3.6-9 shows estimated distances from representative roadways types in the County to the 60 and 65 traffic noise contours (San Bernardino County 2005). Most roads in the project area are rural and have very little traffic. The average daily traffic volume along SR 58 in the project area is approximately 11,000 vehicles (California Department of Transportation 2010). Based on data in Table 3.6-9 for freeways, the 60 $L_{dn}$ contour for SR 58 is about 425 feet from the road, and the 65 $L_{dn}$ contour is about 200 feet from the road.

Pumps are the primary source of noise from current remediation operations. These include well pumps associated with extraction and injection wells, pumps used to move water through pipelines, and pumps for sampling groundwater monitoring wells. Monitoring well sampling pumps are only operated for a limited time (typically less than 15 to 30 minutes) when purging the well prior to sampling. Pumps vary in size from 0.6 horsepower (hp) to 30 hp depending on use (Johnson pers. comm.2011). All pumps are powered by electricity.

Table 3.6-10 shows the number of wells ~~pumps~~ and linear feet (LF) of pipeline associated with the existing remediation program.

**Table 3.6-9. Estimated Distances to Day-Night Level[a] Contours from Representative Roadways in San Bernardino County**

| Representative Roadway Type | Average Daily Traffic (vehicles) | Percentage of Average Daily Traffic | | | Speed (mph)[b] | Estimated Distance from Centerline to DNL Contour (feet) | |
|---|---|---|---|---|---|---|---|
| | | Autos | Medium Trucks | Heavy Trucks | | 65 dBA | 60 dBA |
| Rural or Suburban Arterial | 5,000 | 92 | 4 | 4 | 35 | 30 | 80 |
| | | | | | 45 | 50 | 120 |
| | 15,000 | | | | 35 | 90 | 220 |
| | | | | | 45 | 140 | 330 |
| | 25,000 | | | | 35 | 140 | 350 |
| | | | | | 45 | 220 | 440 |
| | 40,000 | | | | 35 | 150 | 380 |
| | | | | | 45 | 230 | 500 |
| | 55,000 | | | | 45 | 250 | 600 |
| Freeway | 28,000 | 89 | 4 | 7 | 65 | 360 | 790 |
| | 75,000 | | | | | 570 | 1,100 |
| | 125,000 | | | | | 750 | 1,500 |
| | 225,000 | | | | | 900 | 1,770 |

Source: San Bernardino County 2005.

NOTE: Average Daily Traffic on SR 58 is approximately 11,000.

[a] Day-Night Level ($L_{dn}$) or DNL

[b] Heavy trucks were assumed to be traveling at 60 mph on the freeway.

**Table 3.6-10. Wells and Pipelines Associated with Existing Remediation Program**

| Type of Remediation and Infrastructure | Existing Conditions |
|---|---|
| **Agricultural Treatment** | |
| Pipelines | 24,499 LF |
| Wells | 29 |
| **In-Situ Treatment** | |
| Pipelines | 14,985 LF |
| Wells | 70 |
| **Freshwater Injection** | |
| Pipelines | 31,886 LF |
| Wells | 5 ~~8~~ |
| **Monitoring Wells** | 434 |
| **Total Pipelines** | 71,370 LF |
| **Total Wells** | 541 |

Note: Each well (except monitoring wells) has an associated electric pump.

Table 3.6-11 summarizes typical noise levels produced by pumps ranging from 1 to 30 hp (Hoover and Keith 2000). This table also shows the distances within which the County noise standards of 55 dBA (daytime) and 45 dBA (nighttime) would be exceeded for each pump size.

**Table 3.6-11. Noise Levels Produced by Electric Pumps**

| Pump Horsepower | Sound Level at 50 feet (dBA) | Distance (ft) to 55 dBA ($L_{eq}$) Daytime Standard | Distance (ft) to 45 dBA ($L_{eq}$) Nighttime Standard |
|---|---|---|---|
| 1 | 48 | 22 | 71 |
| 2 | 51 | 32 | 100 |
| 3 | 52 | 35 | 112 |
| 5 | 55 | 48 | 150 |
| 7.5 | 56 | 56 | 177 |
| 10 | 58 | 71 | 223 |
| 20 | 61 | 100 | 315 |
| 30 | 62 | 112 | 354 |

All of these pumps are located within the well casing below the surface, which results in a reduced sound level at the surface. A reasonably conservative assumption is that submersion of a pump reduces noise by 5 dB. Table 3.6-12 summarizes pump noise levels and distances to County noise standards assuming a 5 dB reduction from submersion.

**Table 3.6-12. Noise Levels Produced by Submerged Electric Pumps**

| Pump Horsepower | Sound Level at 50 feet (dBA) | Distance (ft) to 55 dBA ($L_{eq}$) Daytime Standard | Distance (ft) to 45 dBA ($L_{eq}$) Nighttime Standard |
|---|---|---|---|
| 1 | 43 | 13 | 40 |
| 2 | 46 | 18 | 56 |
| 3 | 47 | 20 | 63 |
| 5 | 50 | 28 | 89 |
| 7.5 | 51 | 32 | 100 |
| 10 | 53 | 40 | 126 |
| 20 | 56 | 56 | 177 |
| 30 | 57 | 63 | 199 |

With the exception of the five freshwater injection wells located on the west side of the project area, along S~~i~~erra Road, and PG&E well 14, located south of the Compressor Station on Highcrest Road, all pumps are located at least 1,000 feet from the nearest residence. The freshwater injection wells are as close as 200 feet from nearby residences. These wells have 2 hp submersible pumps. PG&E well 14 is about 560 feet from the nearest residence and equipped with a 7.5 hp submersible pump~~s~~.

In summary, the information in Table 3.6-12 indicates that none of the pumps currently in operation are producing noise levels that exceed County daytime or nighttime noise standards. In addition, as of April 2013~~ early 2011~~, there have been no noise complaints associated with development or operation of remediation activities (Johnson pers. comm. 2011, McCarthy pers. comm. 2013).

## 3.6.4 Significance Criteria

The State CEQA Guidelines, Appendix G (14 CCR 15000 et seq.), have identified significance criteria to be considered when determining whether a project could result in significant noise effects within the project area. For this analysis, an impact pertaining to noise was considered significant under CEQA if:

- Residential uses would be exposed to construction noise that exceeds County noise standards (55 dBA daytime and 45 dBA nighttime) during non-exempt hours.
- Residential uses would be exposed to construction vibration that exceeds County vibration standards (PPV exceeding 0.2 inch per second at the lot line).
- Residential uses would be exposed to operational noise that exceeds County noise standards (55 dBA daytime and 45 dBA nighttime).

Noise impacts are identified according to how the project would change noise conditions relative to existing conditions. Existing conditions are defined as the physical conditions on the ground as of late 2011. A project-related increase in noise is considered significant if the increase would cause an applicable County noise standard to be exceeded.

## 3.6.5 Methodology

This section describes how noise and vibration impacts are evaluated for both construction and operation of the project.

### 3.6.5.1 Construction Impacts

Impacts are evaluated by identifying the primary sources of noise and vibration associated with project construction and assigning typical noise and vibration levels based on standard reference information. Distances within which County noise and vibration standards could be exceeded are then identified. Residential uses located within those distances are considered to be exposed to significant construction noise or vibration impacts. Table 3.6-13 lists the equipment expected to be used during construction under each alternative. The table also identifies representative equipment and sound levels from the *Transit Noise and Vibration Impact Assessment* (Federal Transit Administration 2006). $L_{max}$ sound levels at 50 feet are shown along with the typical acoustic use factors. The acoustic use factor is the percentage of time each piece of construction equipment is assumed to be operating at full power (i.e., its loudest condition) during construction. This number is used to estimate $L_{eq}$ values from $L_{max}$ values. For example, the $L_{eq}$ value for a piece of equipment that operates at full power 50% of the time (acoustical use factor of 50) is 3 dB less than the $L_{max}$ value.

To account for simultaneous operation of equipment, noise levels for the four loudest pieces of equipment associated with each construction activity have been summed to provide a reasonable worst-case estimate of construction noise for each activity.

1 **Table 3.6-13. Summary of Construction Equipment and Typical Noise Levels**

| Alternative | Construction Activity | Project Equipment | Representative Reference Source | Acoustical Use Factor | $L_{max}$ at 50 Feet | $L_{eq}$ at 50 Feet | Cumulative Sound Level $L_{eq}$ at 50 Feet[a] |
|---|---|---|---|---|---|---|---|
| All Alternatives | Pipeline installation | Excavator | Excavator | 40 | 81 | 81 | 88 |
| | | Backhoe | Backhoe | 40 | 78 | 78 | |
| | | Front-end loader | Front-end loader | 40 | 79 | 79 | |
| | | Motor grader | Grader | 40 | 85 | 85 | |
| | | Water truck | Flatbed truck | 40 | 74 | 74 | |
| | | Utility potholing machine | Paver | 50 | 77 | 77 | |
| | | Utility/support/welding truck | Flatbed truck | 40 | 74 | 74 | |
| | | Jumping jack compactor | Compactor (ground) | 20 | 83 | 82 | |
| | | Vibratory plate compactor | Compactor (ground) | 20 | 83 | 82 | |
| | | Trench roller compactor | Roller | 20 | 80 | 79 | |
| | | Generator | Generator | 50 | 81 | 81 | |
| | | Compressor | Compressor (air) | 40 | 78 | 78 | |
| | | HDPE welding machine | Welder/torch | 40 | 74 | 74 | |
| | Well installation and development | Drill rig | Drill rig truck | 20 | 79 | 78 | 83 |
| | | Auxiliary compressor | Compressor (air) | 40 | 78 | 78 | |
| | | Support truck | Flatbed truck | 40 | 74 | 74 | |
| | | Forklift | Pickup truck | 40 | 75 | 75 | |

| Alternative | Construction Activity | Project Equipment | Representative Reference Source | Acoustical Use Factor | $L_{max}$ at 50 Feet | $L_{eq}$ at 50 Feet | Cumulative Sound Level $L_{eq}$ at 50 Feet[a] |
|---|---|---|---|---|---|---|---|
| Alternatives 4C-3 and 4C-5 only (Above-Ground Treatment Facility) | Grading/ excavation | Motor grader | Grader | 40 | 85 | 85 | 86 |
| | | Backhoe | Backhoe | 40 | 78 | 78 | |
| | | Utility/support/welding truck | Flatbed truck | 40 | 74 | 74 | |
| | Paving/ concrete | Cement/mortar maker | Drum mixer | 50 | 80 | 80 | 93 |
| | | Roller | Roller | 20 | 80 | 79 | |
| | | Motor grader | Grader | 40 | 85 | 85 | |
| | | Chop saw for steel | Concrete saw | 20 | 90 | 89 | |
| | | Vibratory plate compactor | Compactor (ground) | 20 | 83 | 82 | |
| | | Utility/support/welding truck | Flatbed truck | 40 | 74 | 74 | |
| | | Rubber-tired dozer | Dozer | 40 | 82 | 82 | |
| | | Front-end loader | Front-end loader | 40 | 79 | 79 | |
| | | Water truck | Flatbed truck | 40 | 74 | 74 | |
| | | Paver | Paver | 50 | 77 | 77 | |
| | | Front-end loader with forks | Front-end loader | 40 | 79 | 79 | |
| | | Concrete saw | Concrete saw | 20 | 90 | 89 | |
| | | Generators | Crane | 16 | 81 | 80 | |
| | Building construction | Crane | Crane | 16 | 81 | 80 | 93 |
| | | Tractor/loader/backhoe | Front-end loader | 40 | 79 | 79 | |
| | | Cutoff saw or demolition saw | Concrete saw | 20 | 90 | 89 | |
| | | Vibratory plate compactor | Compactor (ground) | 20 | 83 | 82 | |
| | | Utility/support/welding | Flatbed truck | 40 | 74 | 74 | |
| | | Truck | Flatbed truck | 40 | 74 | 74 | |
| | | Forklift | Pickup truck | 40 | 75 | 75 | |
| | | Front-end loader with forks | Front-end loader | 40 | 79 | 79 | |
| | | Concrete saw | Concrete saw | 20 | 90 | 89 | |

Source: Federal Transit Administration 2006.

[a] Cumulative noise level for four loudest pieces of equipment.

### 3.6.5.2 Operational Impacts

For project operation, primary sources of operational noise and vibration are identified and assigned typical noise and vibration levels. Distances within which San Bernardino County noise and vibration standards could be exceeded are then identified. Residential uses located within those distances are considered to be exposed to significant operational noise or vibration impacts.

## 3.6.6 Impacts

This section provides the impact analysis and mitigation measures related to noise. The impacts are organized by topics that correspond with the significance criteria described in Section 3.6.4, *Significance Criteria*. For each impact, an overview with a general discussion of the impact and the significance determination is followed by a discussion of how the impact differs for each of the alternatives. In cases where an impact would not differ between alternatives, a single discussion of the impact and the significance determination is presented.

### 3.6.6.1 Construction Noise and Vibration

**Impact NOI-1a: Exposure of Noise-Sensitive Land Uses to Excessive Construction Noise (Less than Significant, No Project; Less than Significant with Mitigation, All Action Alternatives)**

#### Overview of Impacts

Construction activities, particularly well drilling and above-ground treatment facility construction, would have the potential to expose noise-sensitive land uses to excessive construction noise. All alternatives would require construction of new wells, which would result in substantial temporary increases in noise relative to ambient noise conditions at some residences in the project area. Construction equipment is exempt from the County noise standards between 7 a.m. and 7 p.m. Monday through Saturday, excluding holidays. However, under all alternatives, there would be construction noise increases that would exceed County standards at residences located within several thousand feet of the activity outside the exempt hours. Additionally, the five action alternatives would result in the construction of new facilities, including new agricultural treatment units (all action alternatives) and new above-ground treatment plants (Alternatives 4C-3 and 4C-5), which would involve the construction of more wells, pipelines, and associated infrastructure and further increase the number of residences exposed to construction noise.

The differences in noise increases and residential exposure are described in the discussion below. For each alternative, a table is provided that lists the infrastructure being constructed, as well as a table that lists the cumulative construction noise levels for pipeline installation and well installation and development. Table data are based on the construction information in Table 3.6-13 and the distances within which County noise standards would be exceeded, given a point-source sound attenuation of 6 dB per doubling of distance. Under all alternatives, residential uses would be exposed to construction noise that exceeds County standards (55 dBA daytime and 45 dBA nighttime) during non-exempt hours.

For the No Project Alternative, this impact would be less than significant because noise-reducing mitigation identified in the initial study/mitigated negative declaration prepared for the General Permit for the Site-wide Groundwater Remediation Project (California Regional Water Quality Control Board, Lahontan Region 2008) would be implemented.

For all of the action alternatives, this impact is considered significant. Implementing **Mitigation Measure ~~MM-~~NOI-~~MM~~-1** would reduce this impact to a less-than-significant level.

## No Project Alternative

The No Project Alternative is the condition that would exist when PG&E implements remedial actions allowed by prior Water Board orders to address issues related to the general area of contamination present at the time when the 2008 General Permit, and its amendments, was issued. Table 3.6-14 provides data regarding total linear feet for pipelines and the number of well ~~pumps~~s associated with existing remediation conditions and build out under the No Project Alternative. In general, the additional wells would be at least 1,000 feet from the nearest residences. However, there is one exception:

- The new extraction well to be located west of the Compressor Station, about 500 feet south of Community Boulevard, would be within about 780 feet of an existing residence.

**Table 3.6-14. Wells and Pipelines under the No Project Alternative**

| Type of Treatment and Infrastructure | Units | Existing Conditions | No Project | Change under No Project Alternative vs. Existing Conditions |
|---|---|---|---|---|
| **Agricultural Treatment** | | | | |
| Pipelines | LF | 24,499 | 24,499 | 0 |
| Wells | # | 29 | 29 | 0 |
| **In-Situ Treatment** | | | | |
| Pipelines | LF | 14,985 | 33,892 | 18,907 |
| Wells | # | 70 | 109 | 39 |
| **Above-Ground Treatment** | | | | |
| Wells | # | 0 | 0 | 0 |
| Pipelines | LF | 0 | 0 | 0 |
| **Freshwater Injection** | | | | |
| Pipelines | LF | 31,886 | 31,886 | 0 |
| Wells | # | 8 | 8 | 0 |
| **Monitoring Wells** | # | 434 | 446 | 12 |
| **TOTAL** | | | | |
| Pipelines | LF | 71,370 | 90,277 | 18,907 |
| Wells | # | 541 | 592 | 51 |

Table 3.6-15 provides the cumulative construction noise level for pipeline installation and for well installation and development. Construction noise increases that occur outside the exempt hours could result in noise that exceeds County standards at residences located within several thousand feet of the activity.

**Table 3.6-15. Construction Noise Associated with No Project Alternative**

| Construction Activity | Cumulative Sound Level $L_{eq}$ at 50 Feet[a] | Distance (ft) to 55 dBA ($L_{eq}$) Daytime Standard | Distance (ft) to 45 dBA ($L_{eq}$) Nighttime Standard |
|---|---|---|---|
| Pipeline installation | 88 | 2,233 | 7,063 |
| Well installation and development | 83 | 1,256 | 3,972 |

[a] This is the distance to the 55 or 45 dBA contour, within which the indicated standard would be exceeded.

Although the noise standard is exceeded for the No Project Alternative, this impact is considered less than significant because construction was previously authorized pursuant to implementation of the following ~~(~~mitigation measures~~)~~ identified in the Initial Study/Mitigated Negative Declaration prepared for the general permit for the Site-wide Groundwater Remediation Project (California Regional Water Quality Control Board, Lahontan Region 2008):

- The project will be constructed in accordance with the San Bernardino County General Plan Noise Element standard for residential development.
- Construction work will be conducted only during daytime business hours.
- Construction vehicle traffic will be scheduled so as to prevent an excessive number of vehicles from being on site at any one time.
- If noise complaints are received, the site manager will measure the noise level using a decibel meter at the project limits. All measurements will be documented in the site log. If the noise level is found to exceed the County ordinance, the site manager will take appropriate action<u>s</u> to reduce noise on-site and note such actions in the log.

## Alternative 4B

Alternative 4B would expand the area, intensity, and duration of remediation activities beyond that of existing remediation activities in the project area. Table 3.6-16 provides data regarding total linear feet for pipelines and the number of well ~~pumps~~s associated with existing remediation conditions and build out of Alternative 4B. In general, the known location <u>of</u> additional wells would not be <u>any closer to residences than the existing wells and would be</u> at least 1,000 feet from the nearest residences. However, there are two exceptions:

- The new injection well to be located west of the Compressor Station, about 500 feet south of Community Boulevard, would be within about 300 feet of an existing residence.
- The new extraction well to be located 300 feet north of Alcudia Road would be within about 200 feet of an existing residence.

In addition, as remediation is expanded, there may be additional wells located close to residences to address the expanded plume.

**Table 3.6-16. Wells and Pipelines under Alternative 4B**

| Type of Treatment and Infrastructure | Units | Existing Conditions | Alternative 4B | Change under Alternative 4B vs. Existing Conditions |
|---|---|---|---|---|
| **Agricultural Treatment** | | | | |
| Pipelines | LF | 24,499 | 78,419 | 53,920 |
| Wells | # | 29 | 90 | 61 |
| **In-Situ Treatment** | | | | |
| Pipelines | LF | 14,985 | 42,365 | 27,380 |
| Wells | # | 70 | 136 | 66 |
| **Above-Ground Treatment** | | | | |
| Wells | # | 0 | 0 | 0 |
| Pipelines | LF | 0 | 0 | 0 |
| **Freshwater Injection** | | | | |
| Pipelines | LF | 31,886 | 36,669 | 4,783 |
| Wells | # | 8 | 9 | 1 |
| **Monitoring Wells** | # | 434 | 558 | 124 |
| **TOTAL** | | | | |
| Pipelines | LF | 71,370 | 157,453 | 86,083 |
| Wells | # | 541 | 793 | 252 |

Table 3.6-17 summarizes the cumulative construction noise level for pipeline installation and for well installation and development. Construction noise increases that occur outside the exempt hours could result in noise that exceeds County standards at residences located within several thousand feet of the activity. This impact is therefore considered to be significant. Implementation of **Mitigation Measure NOI-MM-1** would reduce this impact to a less-than-significant level.

**Table 3.6-17. Construction Noise Associated with Alternative 4B**

| Construction Activity | Cumulative Sound Level $L_{eq}$ at 50 Feet | Distance (ft) to 55 dBA ($L_{eq}$) Daytime Standard | Distance (ft) to 45 dBA ($L_{eq}$) Nighttime Standard |
|---|---|---|---|
| Pipeline installation | 88 | 2,233 | 7,063 |
| Well installation and development | 83 | 1,256 | 3,972 |

### Alternative 4C-2

Alternative 4C-2 would expand the area, intensity, and duration of remediation activities beyond that of existing remediation activities in the project area. In addition, it would use much of the same general infrastructure and optimization related to plume containment and in-situ treatment as that proposed under Alternative 4B. However, Alternative 4C-2 would differ from Alternative 4B in that it would include more intensive agricultural treatment (five new agricultural treatment units compared with one new agricultural treatment unit) with the addition of the use of winter crops (winter rye or a similar crop). Table 3.6-18 provides data regarding total linear feet for pipelines and the number of well pumps associated with existing remediation conditions and build out of Alternative 4C-2. In general, the known additional wells would not be any closer to residences than the existing wells and would be at least 1,000 feet from the nearest residences. However, there are two exceptions to this:

- The new extraction well to be located about 1,100 feet east of Mountain View Road, between SR 58 and Community Boulevard, would be about 900 feet from existing residences.
- The new extraction well to be located within the Gorman South Agricultural Unit would be about 650 feet from existing residences.

In addition, as remediation is expanded, there may be additional wells located close to residences to address the expanded plume.

**Table 3.6-18. Wells and Pipelines under Alternative 4C-2**

| Type of Treatment and Infrastructure | Units | Existing Conditions | Alternative 4C-2 | Change under Alternative 4C-2 vs. Existing Conditions |
|---|---|---|---|---|
| **Agricultural Treatment** | | | | |
| Pipelines | LF | 24,499 | 83,374 | 58,875 |
| Wells | # | 29 | 102 | 73 |
| **In-Situ Treatment** | | | | |
| Pipelines | LF | 14,985 | 42,365 | 27,380 |
| Wells | # | 70 | 136 | 66 |
| **Above-Ground Treatment** | | | | |
| Wells | # | 0 | 0 | 0 |
| Pipelines | LF | 0 | 0 | 0 |
| **Freshwater Injection** | | | | |
| Pipelines | LF | 31,886 | 36,669 | 4,783 |
| Wells | # | 8 | 9 | 1 |
| **Monitoring Wells** | # | 434 | 558 | 124 |
| **TOTALS** | | | | |
| Pipelines | LF | 71,370 | 162,408 | 91,038 |
| Wells | # | 541 | 805 | 264 |

Table 3.6-19 summarizes the cumulative construction noise level for pipeline installation and for well installation and development. Construction noise increases that occur outside the exempt hours could result in noise that exceeds County standards at residences located within several thousand feet of the activity. This impact is therefore considered to be significant. Implementation of **Mitigation Measure NOI-MM-1** would reduce this impact to a less-than-significant level.

**Table 3.6-19. Construction Noise Associated with Alternative 4C-2**

| Construction Activity | Cumulative Sound Level $L_{eq}$ at 50 Feet | Distance (ft) to 55 dBA ($L_{eq}$) Daytime Standard | Distance (ft) to 45 dBA ($L_{eq}$) Nighttime Standard |
|---|---|---|---|
| Pipeline installation | 88 | 2,233 | 7,063 |
| Well installation and development | 83 | 1,256 | 3,972 |

### Alternative 4C-3

Alternative 4C-3 would expand the area, intensity, and duration of remediation activities beyond that of existing remediation activities in the project area. In addition, it would use much of the same general infrastructure and optimization related to plume containment, agricultural treatment, and in-situ treatment as that proposed under Alternative 4C-2. Furthermore, Alternative 4C-3 includes two above-ground treatment plants to provide continuous year-round pumping and treat excess winter water that cannot be treated by the proposed agricultural treatment. Table 3.6-20 provides data regarding total linear feet for pipelines and the number of well pumps associated with existing remediation conditions and build out of Alternative 4C-3. In general, the known additional wells would not be any closer to residences than the existing wells and would be at least 1,000 feet from the nearest residences. However, there are three exceptions to this:

- The new injection well to be located west of the Compressor Station, about 500 feet south of Community Boulevard, would be within about 300 feet of an existing residence.
- The new extraction well to be located about 600 feet east of Mountain View Road and 1,200 feet south of SR 58 would be within about 750 feet of a residence.
- The new extraction well to be located 300 feet north of Alcudia Road would be within about 200 feet of an existing residence.
- The new extraction well to be located about 475 feet south of Thompson Road would be within about 460 feet of an existing residence.

In addition, as remediation is expanded, there may be additional wells located close to residences to address the expanded plume.

**Table 3.6-20. Wells and Pipelines under Alternative 4C-3**

| Treatment Type and Infrastructure | Units | Existing Conditions | Alternative 4C-3 | Change under Alternative 4C-3 vs. Existing Conditions |
|---|---|---|---|---|
| **Agricultural Treatment** | | | | |
| Pipelines | LF | 24,499 | 83,374 | 58,875 |
| Wells | # | 29 | 102 | 73 |
| **In-Situ Treatment** | | | | |
| Pipelines | LF | 14,985 | 42,365 | 27,380 |
| Wells | # | 70 | 136 | 66 |
| **Above-Ground Treatment** | | | | |
| Wells | # | 0 | 31 | 31 |
| Pipelines | LF | 0 | 41,816 | 41,816 |
| **Freshwater Injection** | | | | |
| Pipelines | LF | 31,886 | 36,669 | 4,783 |
| Wells | # | 8 | 9 | 1 |
| **Monitoring Wells** | # | 434 | 558 | 124 |
| **TOTAL** | | | | |
| Pipelines | LF | 71,370 | 204,224 | 132,854 |
| Wells | # | 541 | 836 | 295 |

Table 3.6-21 summarizes the cumulative construction noise level for each activity. Construction noise increases that occur outside the exempt hours could result in noise that exceeds County standards at residences located within several thousand feet of the activity. This impact is therefore considered to be significant. Implementation of **Mitigation Measure NOI-MM-1** would reduce this impact to a less-than-significant level.

**Table 3.6-21. Construction Noise Associated with Alternative 4C-3**

| Construction Activity | Cumulative Sound Level $L_{eq}$ at 50 Feet | Distance (ft) to 55 dBA ($L_{eq}$) Daytime Standard | Distance (ft) to 45 dBA ($L_{eq}$) Nighttime Standard |
|---|---|---|---|
| Pipeline installation | 88 | 2,233 | 7,063 |
| Well installation and development | 83 | 1,256 | 3,972 |
| Grading/excavation | 86 | 1,774 | 5,610 |
| Paving/concrete | 94 | 4,456 | 14,092 |
| Building construction | 93 | 3,972 | 12,559 |

### Alternative 4C-4

Alternative 4C-4 would expand the area, intensity, and duration of remediation activities beyond that of existing remediation activities in the project area. In addition, it would use much of the same general infrastructure and optimization proposed under Alternatives 4B and 4C-2 but include a significant expansion of agricultural treatment (with 16 agricultural treatment units compared with

five agricultural treatment units). Continuous pumping would be provided in winter because there would be no above-ground treatment plant, as proposed under Alternatives 4C-3 and 4C-5. Table 3.6-22 provides data regarding total linear feet for pipelines and the number of well pumps associated with existing remediation conditions and build out of Alternative 4C-4. In general, the known additional wells would not be any closer to residences than the existing wells and would be at least 1,000 feet from the nearest residences. However, there are three exceptions to this:

- The new injection well to be located west of the Compressor Station, about 500 feet south of Community Boulevard, would be within about 300 feet of an existing residence.
- The new extraction well to be located about 600 feet east of Mountain View Road and 1,200 feet south of SR 58 would be within about 750 feet of a residence.
- The new extraction well to be located within the Gorman South Agricultural Unit would be about 650 feet from existing residences.

In addition, as remediation is expanded, there may be additional wells located close to residences to address the expanded plume.

**Table 3.6-22. Pipelines and Wells under Alternative 4C-4**

| Type of Treatment and Infrastructure | Units | Existing Conditions | Alternative 4C-4 | Change under Alternative 4C-4 vs. Existing Conditions |
|---|---|---|---|---|
| **Agricultural Treatment** | | | | |
| Pipelines | LF | 24,499 | 147,374 | 122,875 |
| Wells | # | 29 | 190 | 161 |
| **In-Situ Treatment** | | | | |
| Pipelines | LF | 14,985 | 42,365 | 27,380 |
| Wells | # | 70 | 136 | 66 |
| **Above-Ground Treatment** | | | | |
| Wells | # | 0 | 0 | 0 |
| Pipelines | LF | 0 | 0 | 0 |
| **Freshwater Injection** | | | | |
| Pipelines | LF | 31,886 | 36,669 | 4,783 |
| Wells | # | 9 | 8 | 1 |
| **Monitoring Wells** | # | 434 | 558 | 124 |
| **TOTALS** | | | | |
| Pipelines | LF | 71,370 | 226,408 | 155,038 |
| Wells | # | 541 | 893 | 352 |

Table 3.6-23 summarizes the cumulative construction noise level for pipeline installation and for well installation and development. Construction noise increases that occur outside the exempt hours could result in noise that exceeds County standards at residences located within several thousand feet of the activity. This impact is therefore considered to be significant. Implementation of **Mitigation Measure NOI-MM-1** would reduce this impact to a less-than-significant level.

**Table 3.6-23 Construction Noise Associated with Alternative 4C-4**

| Construction Activity | Cumulative Sound Level $L_{eq}$ at 50 Feet | Distance (ft) to 55 dBA ($L_{eq}$) Daytime Standard | Distance (ft) to 45 dBA ($L_{eq}$) Nighttime Standard |
|---|---|---|---|
| Pipeline installation | 88 | 2,233 | 7,063 |
| Well installation and development | 83 | 1,256 | 3,972 |

**Alternative 4C-5**

Alternative 4C-5 would expand the area, intensity, and duration of remediation activities beyond that of existing remediation activities in the project area. In addition, it would use much of the same general infrastructure and optimization related to plume containment, agricultural treatment, in-situ treatment, and above-ground treatment as that proposed under Alternative 4C-3. However, Alternative 4C-5 would have one above-ground treatment plant, while Alternative 4C-3 would have two plants. Table 3.6-24 provides data regarding total linear feet for pipelines and the number of well pumps associated with existing remediation conditions and build out of Alternative 4C-5. In general, the known additional wells would not be any closer to residences than the existing wells and would be at least 1,000 feet from the nearest residences. However, there are two exceptions to this:

- The new injection well to be located west of the Compressor Station, about 500 feet south of Community Boulevard, would be within about 300 feet of an existing residence.
- The new extraction well to be located within the Gorman South Agricultural Unit would be about 650 feet from existing residences.

In addition, as remediation is expanded, there may be additional wells located close to residences to address the expanded plume.

**Table 3.6-24 Pipelines and Wells under Alternative 4C-5**

| Type of Treatment and Infrastructure | Units | Existing Conditions | Alternative 4C-5 | Change under Alternative 4C-5 vs. Existing Conditions |
|---|---|---|---|---|
| **Agricultural Treatment** | | | | |
| Pipelines | LF | 24,499 | 83,374 | 58,875 |
| Wells | # | 29 | 102 | 73 |
| **In-Situ Treatment** | | | | |
| Pipelines | LF | 14,985 | 36,340 | 21,355 |
| Wells | # | 70 | 114 | 44 |
| **Above-Ground Treatment** | | | | |
| Wells | # | | 2~~0~~4 | 2~~0~~4 |
| Pipelines | LF | | 8,594 | 8,594 |
| **Freshwater Injection** | | | | |
| Pipelines | LF | 31,886 | 36,669 | 4,783 |
| Wells | # | 8 | 9 | 1 |
| **Monitoring Wells** | # | 434 | 558 | 124 |
| **TOTALS** | | | | |
| Pipelines | LF | 71,370 | 164,977 | 93,607 |
| Wells | # | 541 | 806 | 265 |

Table 3.6-25 summarizes the cumulative construction noise level for each activity. Construction noise increases that occur outside the exempt hours could result in noise that exceeds County standards at residences located within several thousand feet of the activity. This impact is therefore considered to be significant. Implementation of **Mitigation Measure NOI-MM-1** would reduce this impact to a less-than-significant level.

**Table 3.6-25. Construction Noise Associated with Alternative 4C-5**

| Construction Activity | Cumulative Sound Level $L_{eq}$ at 50 Feet | Distance (ft) to 55 dBA ($L_{eq}$) Daytime Standard | Distance (ft) to 45 dBA ($L_{eq}$) Nighttime Standard |
|---|---|---|---|
| Pipeline installation | 88 | 2,233 | 7,063 |
| Well installation and development | 83 | 1,256 | 3,972 |
| Grading/excavation | 86 | 1,774 | 5,610 |
| Paving/concrete | 94 | 4,456 | 14,092 |
| Building construction | 93 | 3,972 | 12,559 |

### Impact NOI-1b: Exposure of Noise-Sensitive Land Uses to Excessive Ground Vibration from Construction Activities (Less than Significant, All Alternatives)

#### Overview of Impacts

Vibration from construction activity is a potential concern when highly dynamic equipment, such as pile drivers or pavement breakers, is used. Vibration levels produced by construction equipment are shown in Table 3.6-4~~5~~.

As shown in Table 2-9, *Required Construction Equipment and Infrastructure* (Section 2.9 in Chapter 2, *Project Description*), highly dynamic equipment, such as pile drivers or pavement breakers, is not expected to be used during construction for any of the alternatives, although non-dynamic construction equipment would be used, equipment that typically produces vibration that is less than the County standard of 0.20 inch per second at a distance of about 25 feet. Most project-related construction activities will not occur within several hundred feet of residences, and thus most construction activities are not expected to result in vibration that exceeds the County standard. In addition, temporary construction activities are exempt from the County standard between 7 a.m. and 7 p.m., except Sundays and federal holidays.

However, in order to implement plume monitoring and to implement Mitigation Measure WTR-MM-2 (see Sections 3.1, *Water Resources and Water Quality*), PG&E may need to install monitoring wells and may need to drill deeper wells in close proximity to residences. If this were to be necessary, it is possible that the County standard could be exceeded if the well located were less than 25 feet from a residence. This impact is therefore considered to be significant. Implementation of **Mitigation Measure NOI-MM-1** would reduce this impact to a less-than-significant level.

### 3.6.6.2 Operational Impacts

**Impact NOI-2: Exposure of Noise-Sensitive Land Uses to Excessive Noise from Remediation Operations (Less than Significant, All Alternatives)**

#### Overview of Impacts

Remediation operations could expose noise-sensitive land uses to operational noise from well pumps. The number of well pumps and the proximity to sensitive land uses (i.e., residential uses) for each alternative is included in the discussion for Impact NOI-1a.

Pump noise levels reported in Table 3.6-12, Noise Levels Produced by Submerged Electric Pumps (in Section 3.6.3.2, *Existing Noise Levels*, above), indicate that pump noise from the largest pump likely to be used would be attenuated to less than the County's nighttime noise standard of 45 dB within about 200 feet of the pump. Because of the relative large spacing between the pumps and the distance to the nearest residences, no meaningful cumulative pump noise is anticipated at nearby residences.

Under all alternatives, based on known locations, no residences are located within 200 feet of the proposed pumps, and increases in noise relative to the existing ambient noise level are not expected to be substantial. Future pump locations are also expected to be separated from residential areas. Therefore, this impact is considered to be less than significant, and no mitigation is required for any of the alternatives.

## 3.6.7 Mitigation Measures

**Mitigation Measure NOI-MM-1: Prepare a Noise/Vibration Control Plan and Employ Noise/Vibration-Reducing Construction Practices to Comply with County Noise Standards**

PG&E or its contractor will ensure that noise/vibration-reducing construction practices are implemented so that construction noise does not exceed applicable County standards. As part of the construction specifications, ~~T~~the project contractor ~~will prepare a noise/vibration control~~

~~plan that~~ will identify feasible measures that can be employed to reduce construction noise/vibration. These may include the measures listed below.

- Scheduling substantial noise-generating/vibration activity during exempt daytime hours
- Requiring construction equipment to be equipped with factory-installed muffling devices and all equipment to be operated and maintained in good working order to minimize noise generation
- Locating noise/vibration-generating equipment as far as practical from noise-sensitive uses including avoiding vibration-generation within 25 feet of any residence, wherever feasible
- Using temporary noise/vibration-reducing enclosures around noise-generating equipment
- Placing temporary barriers between noise/vibration sources and noise-sensitive land uses or taking advantage of existing barrier features (e.g., terrain, structures, edge of trench) to block sound transmission

Per the construction specifications, ~~The noise/vibration control plan will demonstrate that~~ control measures will be implemented to reduce noise and vibration to a level that is in compliance with County noise standards.

# Section 3.7
# Biological Resources

# 3.7 Biological Resources

## 3.7.1 Introduction

This section includes the methodology for determining biological resources present in the project area and a description of the environmental and regulatory setting, summarized from the *Biological Resources Report* prepared by ICF (Appendix C). It also describes the impacts on biological resources from implementation of the project, and mitigation measures that would reduce those impacts.

Growth-inducing and cumulative impacts are discussed separately in Chapter 4, *Other CEQA Analyses*.

### 3.7.1.1 Summary of Impacts

Table 3.7-1 presents a summary of the impacts on biological resources. See Section 3.7.6, *Impacts,* and Section 3.7.7, *Mitigation Measures*, for a detailed discussion of all impacts and mitigation measures.

**Table 3.7-1. Summary of Biological Resources Impacts**

| Impact | Applicable Alternative | Significance before Mitigation | Mitigation Measures | Significance after Mitigation |
|---|---|---|---|---|
| BIO-1a: Disturbance, Mortality, and Loss of Habitat for Desert Tortoise | All Alternatives | Significant | BIO-MM-1a: Implement Measures Required to Minimize, Reduce, or Mitigate Impacts on ~~to~~ Desert Tortoise during Construction~~.~~<br>BIO-MM-1b: Limit Footprint of Disturbance Areas within Special-Status Species Habitats<br>BIO-MM-1c: Implement Pre-Construction and Ongoing Awareness and Training Program~~.~~<br>BIO-MM-1d: Conduct Ongoing Biological ~~Construction~~ Monitoring during Construction~~.~~<br>BIO-MM-1e: Minimize Potential Construction Hazards to Special-Status Species<br>BIO-MM-1f: Implement Measures to Minimize and Prevent Attraction of Predators during Construction and Operation~~Minimize Construction and/or Operational Practices and/or Facilities to Prevent Attraction of Project-Related Predators.~~<br>BIO-MM-1g: Reduction of Project-Related Spread of Invasive Plant Species | Less than Significant (other than desert tortoise movement)<br>Less than Significant (No Project Alternative, desert tortoise movement)<br>Potentially Significant (all action alternatives, desert tortoise movement) |

| Impact | Applicable Alternative | Significance before Mitigation | Mitigation Measures | Significance after Mitigation |
|---|---|---|---|---|
| | | | BIO-MM-1h: Compensate Impacts on ~~to~~ Desert Tortoise and Mohave Ground Squirrel Habitat<br>BIO-MM-1i: Integrated Pest Management and Adaptive Management Plan for Agricultural Treatment Units<br>BIO-MM-1j: Reduction of Night Light Spillover | |
| BIO-1b: Disturbance, Mortality, and Loss of Habitat for Mohave Ground Squirrel | All Alternatives | Potentially Significant | BIO-MM-1b, BIO-MM-1c, BIO-MM-1d, BIO-MM-1e, BIO-MM-1f, BIO-MM-1g, BIO-MM-1h, BIO-MM-1i, BIO-MM-1j, BIO-MM-1k: Implement Other Measures ~~Required~~ to Minimize, Reduce, or Mitigate Impacts on ~~to~~ Mohave Ground Squirrel | Less than Significant |
| BIO-1c: Disturbance, Mortality, and Loss of Habitat for Burrowing Owl and American Badger, and Mortality of Desert Kit Fox | All Alternatives | Potentially Significant | BIO-MM-1b, BIO-MM-1c, BIO-MM-1d, BIO-MM-1e, BIO-MM-1f, BIO-MM-1g, BIO-MM-1h, BIO-MM-1i, BIO-MM-1j, BIO-MM-1l: Implement Other Measures ~~Required~~ to Minimize, Reduce, or Mitigate Impacts on ~~to~~ Burrowing Owl<br>BIO-MM-1m: Minimize Impacts on ~~to~~ American Badger ~~Natal Dens~~ and Desert Kit Fox Occupied Dens | Less than Significant |
| BIO-1d: Disturbance, Mortality, and Loss of Habitat to Loggerhead Shrike and Northern Harrier | No Project | Less than Significant | None Required | -- |
| | All Action Alternatives | Potentially Significant | BIO-MM-1b, BIO-MM-1c, BIO-MM-1d, BIO-MM-1e, BIO-MM-1f, BIO-MM-1i, BIO-MM-1n: Avoid Impacts ~~to~~ on Loggerhead Shrike, Northern Harrier, and Other Nesting Migratory Birds (including Raptors) | Less than Significant |
| BIO-1e: ~~Mortality and~~Potential Loss of Habitat to Mojave River Vole | All Alternatives | Less than Significant | None Required | -- |
| BIO-1f: Mortality and Loss of Habitat for Mojave Fringe-Toed Lizard | All Alternatives | Less than significant | BIO-MM-1b, BIO-MM-1c, BIO-MM-1d, BIO-MM-1e, BIO-MM-1f, BIO-MM-1g, BIO-MM-1p: If Remedial Actions Affect Mojave Fringe-toed Lizard Habitat, then Compensate for Habitat Losses<br>BIO-MM-2: Habitat Compensation for Loss of Sensitive Natural Communities | Less than Significant |
| BIO-1g: Loss of Other Special- | All Alternatives | Potentially Significant | BIO-MM-1i, ~~BIO-MM-1i,~~ BIO-MM-1n | Less than Significant |

| Impact | Applicable Alternative | Significance before Mitigation | Mitigation Measures | Significance after Mitigation |
|---|---|---|---|---|
| Status Birds | | | | |
| BIO-1h: Loss of Individual Plants or Disturbance to Special-Status Plants | All Alternatives | Potentially Significant | BIO-MM-1g, BIO-MM-1o: Implement Measures Required to Minimize, Reduce, or Mitigate Impacts ~~to~~on Special-Status Plants | Less than Significant |
| BIO-2: Reduction or Loss of Function of Riparian Habitat or Sensitive Natural Communities | All Alternatives | Potentially Significant | BIO-MM-2 | Less than Significant |
| BIO-3: Loss or Disturbance of Federal and/or State Jurisdictional Waters (including wetlands) | All Alternatives | Potentially Significant | BIO-MM-3: Measures Required to Minimize, Reduce, or Mitigate Impacts ~~to~~ on Waters and/or Wetlands under the Jurisdiction of the State | Less than Significant |
| BIO-4: Conflicts with Wildlife Movement | No Project Alternative | Less than Significant | None Required | -- |
| | All Action Alternatives | Potentially Significant | BIO-MM-1a, BIO-MM-1b, BIO-MM-1c, BIO-MM-1d, BIO-MM-1e, BIO-MM-1f, ~~BIO-MM-1g,~~ BIO-MM-1h, ~~BIO-MM-1i,~~ BIO-MM-1j, ~~BIO-MM-1k, BIO-MM-1l~~ BIO-MM-4: Implement West Mojave Plan Measures to Impacts ~~to~~on DWMAs on BLM Land~~Applicable Mitigation to Address Locations within the Project Area that Overlap DWMAs (or Conservation Areas) of the West Mojave Plan~~ | Less than Significant<br><br>Potentially Significant (desert tortoise only) |
| BIO-5: Removal of Protected Trees | All Alternatives | Less than Significant | None Required | -- |
| BIO-6: Conflicts with West Mojave Plan Conservation Requirements on BLM Land | No Project Alternative | No Impact | None Required | -- |
| | All Action Alternatives | Potentially Significant | BIO-MM-1a, BIO-MM-1b, BIO-MM-1c, BIO-MM-1d, BIO-MM-1e, BIO-MM-1f, BIO-MM-1g, BIO-MM-1h, BIO-MM-1i, BIO-MM-1j, BIO-MM-1k, BIO-MM-1l, BIO-MM-1o<br>BIO-MM-4 | Less than Significant |

### 3.7.1.2 Methods Used to Identify Biological Resources

The methods used to identify biological resources in the project area consisted of pre-field literature review and field surveys.

#### Pre-field Literature Review

Prior to field surveys, ICF biologists conducted a comprehensive literature review related to the project area to identify potential special-status species that may be found in the project area. Pertinent sources reviewed were:

- California Natural Diversity Database (CNDDB) (California Department of Fish and Game 2013~~1~~) for the twelve~~nine~~ 7.5-minute U.S. Geological Survey quadrangle maps in the project vicinity: Hinkley, Barstow, Barstow SE, Bird Spring, Opal Mountain, Superior Lake, Mud Hills, Water Valley, Lockhart, Twelve Gauge Lake, Wild Crossing, and Hodge.
- California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (California Native Plant Society 2013~~1~~) for the twelve 7.5-minute U.S. Geological Survey quadrangle maps in the project vicinity: Hinkley, Barstow, Barstow SE, Bird Spring, Opal Mountain, Superior Lake, Mud Hills, Water Valley, Lockhart, Twelve Gauge Lake, Wild Crossing, and Hodge.
- United States Fish and Wildlife Service (USFWS) Species list for the project area was generated using the online Information, Planning and Conservation System (IPaC).
- Literature detailing the habitat requirements of special-status species.
- Most recent USFWS critical habitat maps (USFWS 2013~~1~~b).
- U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA/NRCS 2013~~1~~).
- Review of biological survey data provided by PG&E~~collected by CH2MHill and provided by Haley & Aldrich~~ (Pacific Gas and Electric 2012a, 2012b~~2011~~).
- The West Mojave Plan (BLM 2005).

#### Field Survey

ICF biologists conducted reconnaissance-level field surveys in December 2011 and January 2013 to identify and evaluate vegetation communities and habitat assessments for special-status plants and wildlife present within the project area.

Reconnaissance field surveys included on-ground evaluation for the presence, absence, or likelihood of occurrence of special-status species and vegetation types, and for more general biological resources within the project area. Although focused protocol surveys for plants or wildlife were not performed during this field survey, habitat assessments were performed. Parameters evaluated for special-status plants included topography, soil conditions, elevation, hydrology, the site's operational activities, and life history needs for the specific species. Parameters evaluated for special-status wildlife included connectivity to documented and potentially occurring habitat, hydrology, access to the site, foraging and nesting habitat, the site's operational activities, and life history needs for each species.

Only a portion of the project study area could be surveyed due to access restrictions, therefore, much of the reconnaissance was done by visual observation from public roads only.

A formal jurisdictional wetland delineation was not conducted for the project area; however, potential jurisdictional features were noted and mapped during the habitat assessment.

A more detailed description of field survey methods is provided in the *Biological Resources Study* (Appendix C).

### Vegetation Mapping

Vegetation mapping was conducted in the field in December 2011 and January 2013 using approximate 1 inch to 400-foot scale aerials (aerials dated January 31, 2009, and July 19, 2011, respectively), which were later transferred to a digital file using Google Earth and then converted to Geographic Information System shapefiles. After~~Since~~ the initial December 2011 field visit, one polygon was added to the project study area in the northeast portion. For this polygon, a Google Earth aerial (dated January 31, 2009) was used with reference to the vegetation mapping completed in the field to aerially interpret the vegetation. After the January 2013 field visit, an additional polygon was added to the project study area in the southwestern portion. For this polygon, a Google Earth aerial (dated July 19, 2011) was used with reference to the vegetation mapping completed in the field to aerially interpret the vegetation. Where possible, the vegetation mapping followed the classifications defined in A Manual of California Vegetation (Sawyer et al. 2009); however, Holland (1986) was also conferred. A component of aerial interpretation was required for some of the remote and inaccessible locations of the project study area, and was based on colorations and patterns as distinguishing features on the aerial photography.

### Geographic Information System Analysis

Geographic information system analysis was completed by overlaying the project's direct impact footprint on the vegetation communities to calculate the number of acres of each plant community that are estimated to be removed by the project. In addition, a scaling factor was used for potential direct impacts that are expected but are not currently defined in geographic space. Scaling approaches to adjust the areas of potential impact up from the Feasibility Study/Addenda numbers are described in Chapter 2, *Project Description*.

## 3.7.2 Regulatory Setting

The federal, state, and local plans, policies, and laws relevant to biological resources are discussed in this section.

### 3.7.2.1 Federal Regulations

### Federal Endangered Species Act

The federal Endangered Species Act (ESA) (U.S. Government Code [USC], Title 16, Sections 1530 et seq.) protects fish and wildlife species and their habitats that have been identified by the USFWS as threatened or endangered. Endangered refers to species, subspecies, or distinct population segments that are in danger of extinction through all or a significant portion of their range; threatened refers to species, subspecies, or distinct population segments that are likely to become endangered in the near future.

USFWS regulates the "take" (i.e., killing, harassing, or habitat destruction) of federally listed species through Section 9 of the ESA. Take of listed species can be authorized through either the ESA Section 7 consultation process for actions by federal agencies or the ESA Section 10 permit process for actions by nonfederal agencies. Federal agency actions include activities that are:

- On federal land,
- Conducted by a federal agency,
- Funded by a federal agency, or
- Authorized by a federal agency (including issuance of federal permits and licenses).

Under Section 7, the federal agency conducting, funding, or permitting an action (the federal lead agency) must consult USFWS to ensure that the proposed action will not jeopardize endangered or threatened species or destroy or adversely modify designated critical habitat. If a proposed project "may affect" a listed species or designated critical habitat, the lead agency is required to prepare a biological assessment evaluating the nature and severity of the expected effect. In response, USFWS issues a biological opinion with a determination that the proposed action either:

- May jeopardize the continued existence of one or more listed species (jeopardy finding) or result in the destruction or adverse modification of critical habitat (adverse modification finding), or
- Will not jeopardize the continued existence of any listed species (no jeopardy finding) or result in adverse modification of critical habitat (no adverse modification finding).

Under Section 10, which applies to projects where federal action is not involved and take of a listed species may occur, the project proponent may seek an incidental take permit under Section 10(a) of the ESA. Section 10(a) of ESA allows USFWS to permit the incidental take of listed species if such take is accompanied by a habitat conservation plan that ensures minimizing and mitigation of impacts associated with the take.

The biological opinion issued by USFWS may stipulate discretionary "reasonable and prudent" conservation measures. If the project would not jeopardize a listed species, USFWS issues an incidental take statement to authorize the proposed activity.

The ESA applies to the project area due to the presence of one ESA listed threatened species: the desert tortoise. Desert tortoise is known to occur in the project area, which contains many areas of suitable habitat for this species.

## The Recovery Plan for the Mojave Population of the Desert Tortoise

The Recovery Plan for desert tortoise (USFWS 2011a) identifies six recovery units, in which one to four Desert Wildlife Management Areas (DWMAs) were designated, and describes the development and implementation of specific recovery actions focused within the DWMAs. BLM administers the DWMAs on federal land to protect important wildlife and natural resources, such as the desert tortoise. Maintaining high survivorship of adult desert tortoise was identified as the key factor in recovery (U.S. Fish and Wildlife Service 2011a). The project area occurs within a portion of the Superior-Cronese DWMA.

The recovery plan is considered by regulatory agencies in establishing compensatory mitigation or other requirements during the ESA permitting process. The recovery plan is used in this capacity in this EIR as a guide in developing mitigation ratios in the impact analysis.

## Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (16 USC 703) enacts the provisions of treaties between the United States, Great Britain, Mexico, and Japan; and authorizes the U.S. Secretary of the Interior to protect and regulate the taking of migratory birds. It establishes seasons and bag limits for hunted species and protects migratory birds, their occupied nests, and their eggs (16 USC 703; 50 CFR 10 21). Most actions that result in taking or in permanent or temporary possession of a protected species constitute violations of the MBTA. Examples of permitted actions that do not violate the MBTA are the possession of a hunting license to pursue specific game birds, legitimate research activities, display in zoological gardens, bird-banding, and other similar activities. USFWS is responsible for overseeing compliance with the MBTA, and the U.S. Department of Agriculture's Animal Damage Control Officer makes recommendations on related animal protection issues.

The project area supports habitat for the presence of nesting birds and migratory birds protected under the MBTA.

## The Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c), enacted in 1940, and amended several times since then, prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle … [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." For purposes of these guidelines, "disturb" means: "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.

The project area does not include suitable nesting or foraging habitat for bald eagles. The project area also does not include any nesting habitat for golden eagles, although the project area does include potential foraging habitat for golden eagles.

## Federal Noxious Weed Act

Public Law 93-629 (7 U.S.C. 2801 et seq.; 88 Stat. 2148), enacted January 3, 1975, established a Federal program to control the spread of noxious weeds. The Secretary of Agriculture was given the authority to designate plants as noxious weeds by regulation, and the movement of all such weeds in interstate or foreign commerce was prohibited except under permit. The Secretary was also given

authority to inspect, seize and destroy products, and to quarantine areas, if necessary to prevent the spread of such weeds. The Secretary was also authorized to cooperate with other Federal, State and local agencies, farmers associations and private individuals in measures to control, eradicate, or prevent or retard the spread of such weeds.

Section 1453 of P.L. 101-624, the 1990 Farm Bill, enacted November 28, 1990 (104 Stat 3611) amended the Act by requiring each Federal land-managing agency to:

- Designate an office or person adequately trained in managing undesirable plant species to develop and coordinate a program to control such plants on the agency's land;
- Establish and adequately fund this plant management program through the agency's budget process;
- Complete and implement cooperative agreements (requirements for which are provided) with the States regarding undesirable plants on agency land; and
- Establish integrated management systems (as defined in the section) to control or contain undesirable plants targeted under the cooperative agreements.

The law also requires that any environmental assessments or impact statements that may be required to implement plant control agreements must be completed within 1 year of the time the need for the document is established.

The project area contains noxious weeds and potential for the proliferation of noxious weeds due to project implementation.

The Federal Noxious Weed Act does not require specific permits to conduct actions where noxious weeds are present, provided that noxious weeds are not moved. However, the assessment of impacts in this EIR takes into account the concerns in the analysis. BLM implements the Federal Noxious Weed Act for the portions of the project area that are on federal land.

## Clean Water Act

The federal Clean Water Act (CWA) is the primary federal law that protects the quality of the nation's surface waters when they are traditionally navigable waters, are tributary or adjacent to traditionally navigable waters, or are interstate waters. Waters under the jurisdiction of the CWA are referred to as "waters of the United States." The U.S. Army Corps of Engineers regulates fill in waters of the United States under Section 404 of the Clean Water Act. Point discharges to waters of the United States are regulated under Section 402 of the Clean Water Act through National Pollutant Discharge Elimination System (NPDES) permits; in California the regional Water Boards have been delegated the authority to issue NPDES permits. Under Section 401 of the Clean Water Act, state agencies review permits issued by the U.S. Army Corps of Engineers for their effects on water quality. In general, the U.S. Army Corps of Engineers takes jurisdiction over waters that are traditionally navigable, that drain to a traditionally navigable water, or that are adjacent or otherwise have a significant nexus to a traditionally navigable water.

The U.S. Army Corps of Engineers has previously identified that the Mojave River is a water of the United States. For this EIR, waters that drain to the Mojave River, including project area desert washes, are considered to be potential waters of the United States. Most of the project area that would be affected by remedial actions drains northward to nearby Harper Lake. The U.S. Army Corps of Engineers has previously identified that Harper Lake is an isolated intrastate water, and

that its tributaries, including project area desert washes, are not considered waters of the United States. However, Harper Lake and its tributaries ~~to Harper Lake~~ are considered waters of the state and discharges to them would be regulated under the state Porter-Cologne Water Quality Control Act. Section 3.7.5.8 below describes the jurisdictional waters within the project area.

### The West Mojave Plan

The West Mojave Plan is a federal land use plan that outlines the strategy to conserve and protect more than 100 sensitive plant and animal species, as well as provide guidance for compliance with requirements of the State and federal Endangered Species Acts, respectively (Bureau of Land Management 2005). The West Mojave Plan ~~planning~~ area extends through portions of San Bernardino, Los Angeles, Kern, and Inyo Counties. The West Mojave Plan originally started as a broader effort to establish a Habitat Conservation Plan that would cover activities on both private and public land throughout the western Mojave Desert. However, the West Mojave Plan was only adopted as a federal land management plan for federal lands under the jurisdiction of the BLM. The West Mojave Plan does not apply to areas outside of federal land.

The West Mojave Plan includes, but is not limited to, the following species for conservation:

- Desert tortoise (*Gopherus agassizii*).
- Mohave ground squirrel (*Xerospermophilus mohavensis*).
- Burrowing owl (*Athene cunicularia*).
- Mojave fringed-toed lizard (*Uma scoparia*).
- Desert cymopterus (*Cymopterus deserticola*).
- Mojave monkeyflower (*Mimulus mohavensis*).

The project area partially overlaps habitat conservation areas on BLM land designated for desert tortoise and Mohave ground squirrel by the West Mojave Plan. Within the project area, the desert tortoise and Mohave ground squirrel conservation areas in the West Mojave Plan are those portions of the Superior-Cronese DWMA located on federal land.

The West Mojave Plan lists certain requirements for implementing projects within habitat conservation areas on federal land (BLM Management 2006). These requirements are considered in the identification of mitigation for conservation areas on federal land that fall within the project area.

## 3.7.2.2 State Regulations

### California Endangered Species Act

The California Endangered Species Act (CESA) (Fish and Game Code Sections 2050–2097) is administered by the California Department of Fish and Game (CDFG)~~[1]~~ and prohibits the take of plant and animal species designated by CDFG as either threatened or endangered in the state of California. "Take" in the context of the CESA means to hunt, pursue, kill, or capture a listed species, as well as

[1] As noted in Chapter 1, *Introduction*, effective January 2013, the California Department of Fish and Game is called the California Department of Fish and Wildlife. This change is hereby incorporated by reference throughout the EIR.

any other actions that may result in adverse impacts when attempting to take individuals of a listed species.

Sections 2091 and 2081 of the CESA allow CDFG to authorize exceptions to the state's prohibition against take of a listed species. Section 2091 allows state lead agencies that have formally consulted with CDFG to take a listed species, if the take is incidental to carrying out an otherwise lawful project that has been approved under CEQA. Section 2081 allows CDFG to authorize take of a listed species for educational, scientific, or management purposes. Private developers whose projects do not involve a state lead agency under CEQA may not take a listed species without formally consulting with CDFG and agreeing to strict measures and standards for managing the listed species.

The CESA applies to the project area due to the presence of two CESA listed threatened species, the Mohave ground squirrel and desert tortoise, which have been documented in the project area and suitable habitat for these species is found in many parts of the project area.

## California Department of Fish and Game Regulations

### Protected Species in the Fish and Game Code

The California Fish and Game Code provides protection from take for a variety of species, referred to as fully protected species. Section 5050 lists fully protected amphibians and reptiles and prohibits the take of such reptiles and amphibians except as provided in Sections 2081.7 or 2835. Section 5515 prohibits take of fully protected fish species except as provided in Sections 2081.7 or 2835. Fully protected birds are listed under Section 3511, and fully protected mammals are listed under Section 4700; both of these sections prohibit take except as provided in Sections 2081.7 and 2835. Except for take related to scientific research, all take of fully protected species is prohibited.

The project area does not include habitat for any fully protected species.

### Mammal Hunting Regulations

The Mammal Hunting Regulations 2011–2012, Subdivision 2. Game and Furbearers, Chapter 5. Furbearing Mammals, §460 states that fisher, marten, river otter, desert kit fox and red fox may not be taken at any time.

The project area has suitable habitat for desert kit fox.

### California Native Plant Protection Act and Natural Community Conservation Planning Act

The California Native Plant Protection Act (Fish and Game Code Sections 1900–1913) and the Natural Community Conservation Planning Act provide guidance on the preservation of plant resources; these two acts underlie the language and intent of Section 15380(d) of the CEQA Guidelines.

The project area plant communities have the potential to support California Native Plant Protection Act–qualifying plants, which are described in Section 3.7.5.3 below.

### Streambed Alteration Agreements

CDFG has jurisdictional authority over rivers, streams, and lakes under California Fish and Game Code Section 1602. CDFG has the authority to regulate all work under the jurisdiction of California that would: substantially divert, obstruct, or change the natural flow of a river, stream, or lake;

substantially change the bed, channel, or bank of a river, stream, or lake; or use material from a streambed.

In practice, CDFG marks its jurisdictional limit at the top of the stream or lake bank or the outer edge of the riparian vegetation, where present, and sometimes extends its jurisdiction to the edge of the 100-year floodplain. Because riparian habitats do not always support wetland hydrology or hydric soils, wetland boundaries, as defined by CWA Section 404, sometimes include only portions of the riparian habitat adjacent to a river, stream, or lake. Therefore, jurisdictional boundaries under Section 1602 may encompass a greater area than those regulated under CWA Section 404.

CDFG enters into a Streambed Alteration Agreement with an applicant and can request conditions to ensure that no net loss of wetland values or acreage will be incurred. The streambed or lakebed alteration agreement is not a permit but, rather, a mutual agreement between CDFG and the applicant.

California Fish and Game Code Section 1602 may apply to the project area if the project includes construction or operation of facilities in state jurisdictional waters, such as drainage channels and desert washes, which are potentially present at the project site.

#### Bird/Raptor Protections in the Fish and Game Code

Similar to the federal MBTA, Section 3503 of the California Fish and Game Code prohibits take, possession, or destruction of eggs and nests of all birds. Section 3503.5 prohibits the killing of raptor species and the destruction of raptor nests. Take or possession of any migratory non-game bird as designated in the MBTA is prohibited under Sections 3513 and 3800. Section 86 of the Fish and Game Code defines "take" as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill."

The project area includes habitat that supports raptor species.

### California Desert Native Plants Act

The California Desert Native Plants Act (Division 23 of the California Food and Agriculture Code) regulates the unlawful harvesting on both public and privately owned lands of specified desert native plants. Any specified desert native plants require a permit issued by the commissioner of the county in which the plants are growing.

The California Desert Native Plants Act regulates the following desert native plants which cannot be harvested except under a permit:

- All species of Burseraceae family (*elephant tree*).
- Saguaro cactus (*Carnegiea gigantea*).
- California barrel cactus (*Ferocactus cylindraceus synonym Ferocactus acanthodes*).
- Crucifixion thorn (*Castela emoryi*).
- Panamint dudleya (*Dudleya saxosa*).
- Bristlecone pine (*Pinus longaeva*).
- California fan palm (*Washingtonia filifera*).

- Although a complete survey has not been conducted of the project area, to date none of the species regulated by the California Desert Native Plants Act have been observed in the project area.

### Porter-Cologne Water Quality Control Act of 1969

The Porter-Cologne Water Quality Control Act established the State Water Resources Control Board (SWRCB) and divided the state into nine regional basins, each with a regional water quality control board. The SWRCB is the primary state agency responsible for protecting the quality of the state's surface- and groundwater supplies, while the regional boards are responsible for developing and enforcing water quality objectives and implementation plans (as discussed in detail in Section 3.1, *Water Resources and Water Quality*). This act is relevant to biological resources that may be affected in state waters because the Water Board regulates discharges, including construction runoff and sediment, into state waters, including waters that may be outside federal jurisdiction under the CWA. See Section 3.7.5.9 below for a description of waters within the project area.

## 3.7.2.3 Local Regulations

### San Bernardino County Plant Protection and Management

Chapter 88.01 (Plant Protection and Management) of the San Bernardino County Plant Protection and Management chapter regulates the removal or harvesting of specified desert native plants and the removal of vegetation within 200 feet of the bank of a stream, or in an area indicated as a protected riparian area on an overlay map or Specific Plan. Any r~~R~~emoval of specified desert native plants or vegetation within 200 feet of a bank or stream requires approval of a Tree or Plant Removal Permit in compliance with § Section 88.01.050 (Tree or Plant Removal Permits).

The following desert native plants, or any part of them, except fruit, shall not be removed except under a Tree or Plant Removal Permit in compliance with §Section 88.01.050:

- The following desert native plants with stems two 2 inches or greater in diameter or six 6 feet or greater in height: Smoke tree (*Psorothamnus spinosa synonym Dalea spinosa*) and all species of the genus Prosopis (*mesquites*).
- All species of the family Agavaceae (*century plants, nolinas, yuccas*).
- Creosote rings, ten 10 feet or greater in diameter.
- All Joshua trees (*Yucca brevifolia*).
- Any part of the following species, whether living or dead: desert ironwood (*Olneya tesota*), all species of the genera Prosopis (*mesquites*) and Cercidium (*palos verdes*).

The San Bernardino County Plant Protection and Management ordinance applies to the project area due to the presence of Joshua trees. The other locally-protected desert native plants were not observed during field surveys. However, many of the project area vegetation communities (such as the creosote bush scrub that may support creosote rings) have the potential to support the species regulated by the San Bernardino County Plant Protection and Management ordinances.

## 3.7.3 Environmental Setting

The biological study area (BSA), which is the same as the project study area, is located within and adjacent to the unincorporated community of Hinkley with a small area extending into the city limits of Barstow. The project area is situated in Hinkley Valley east and southeast of Lynx Cat Mountain, west and southwest of Mount General, and south of Black and Opal Mountains and the northeast part of Harper Valley. The majority of the project area is under private ownership (including lands owned by PG&E) but also includes a smaller portion within BLM-managed lands, State Route 58 which is a Caltrans right of way, a number of County-maintained roadways, and the Hinkley School. Topographically, the project area is relatively flat and contains one high point in the north, Red Hill. (U.S. Geological Survey 1971). Elevations within the project area range from approximately 2,~~1~~000 to 2,300 feet above mean sea level (amsl). In general, the majority of the project study area slopes towards Harper Dry Lake which is located immediately west of the BSA. In addition, the Mojave River flows adjacent to the southern portion of the BSA.

The project area is vegetated with a mosaic of desert scrub communities (which contain a variety of scrub community types) mixed with agricultural areas, developed residential areas and small private property holdings. The lands located northeast, north and west of the project area are primarily undeveloped. The West Mojave Desert Ecological Reserve, owned and managed by CDFG, occurs north of, but outside, the project area.

### 3.7.3.1 Vegetation Communities

Thirteen distinct vegetation communities were mapped within the project area (Figure 3.7-1 and Table 3.7-2). A detailed description for each vegetation community is provided below.

**Table 3.7-2. Vegetation Communities**

| Vegetation Community | Acres |
|---|---|
| Allscale Scrub | 15,370~~82~~ |
| Allscale Scrub-Sparse Playa | 3,342~~5~~ |
| Allscale Scrub-Disturbed | 592 |
| Fourwing Saltbush Scrub | 2 |
| Creosote Bush Scrub | 5,589~~94~~ |
| California Joint Fir Scrub | 263 |
| Desert Wash | 1,049~~50~~ |
| Desert Dunes | 866 |
| Tamarisk Thickets | 22 |
| Red Brome or Mediterranean Grass Grassland Semi-Natural Herbaceous Stands | 25 |
| Ruderal/Disturbed/Barren | 2,378~~81~~ |
| Agriculture | 1,335~~6~~ |
| Developed | 1,325~~6~~ |
| Total | 32,157[2]~~84~~ |

[2] The project study area and BSA acreage is 32,159. Acreage numbers shown are rounded to the nearest whole number.

## Allscale Scrub

This vegetation community is present throughout the project area (Figure 3.7-1). Typical conditions where allscale scrub occurs within the project area include small washes (or surface drainages, primarily seasonal in the project area), dissected alluvial fans, rolling hills, terraces, and edges of large, low-gradient washes and playas. Some areas of allscale scrub located in the northwestern portion of the project area contain low sandy dunes. Soils are carbonate rich, alkaline, sandy, or sandy clay loams. Within the project area allscale scrub (*Atriplex polycarpa*) is characterized as dominant in the shrub canopy. Other shrubs include creosote bush (*Larrea tridentata*), white bur-sage (*Ambrosia dumosa*), four-wing saltbush (*Atriplex canescens*), burrobush (*Ambrosia salsola*), spiny hopsage (*Grayia spinosa*), sticky snakeweed (*Gutierrezia microcephala*), and peach desert thorn (*Lycium cooperi*). The herbaceous layer is variable with seasonal annuals and non-native grasses such as Eriastrum (*Eriastrum* sp.), red-stemmed filaree (*Erodium cicutarium*), red brome (*Bromus madritensis* ssp. *rubens*), cheat grass (*Bromus tectorum*), and common Mediterranean grass (*Schismus barbatus*).

## Allscale Scrub — Sparse Playa

This vegetation community is present in the northernwestern and southeastern portions of the project area and is associated with several an unnamed washes that conveys flows west and northwest through the project area to Harper Dry Lake (Figure 3.7-1). In addition, some areas of Allscale Scrub-Sparse Playa located in the northwestern portion of the project area contain low sandy dunes. This community generally comprises the same species composition as the allscale scrub vegetation community; however, the density of shrub and herb cover is notably less. In addition, this community contains areas of washes and playa lakebeds and shores that contain fine silty, cracked, alkaline soils supporting only a few scattered shrubs (e.g., allscale) and herbs (e.g., red-stemmed filaree, cheat grass, and common Mediterranean grass). Mojave spineflower (*Chorizanthe spinosa;* CNPS CRPR 4.2) was observed within several of the northern playa features within this habitat.

## Allscale Scrub — Disturbed

This vegetation community is present in the central and northern portions of the project area where there are developed lands (Figure 3.7-1). Based on field observations, the disturbed area has been cleared to various degrees with re-vegetation of allscale scrub occurring presently. This community generally comprises the same species composition as the un-disturbed allscale scrub vegetation community; however, the density of shrub and herb cover is notably less due to the disturbed nature of the area.

## Fourwing Saltbush Scrub

The Fourwing Saltbush Scrub vegetation community is distributed in a small area in the central portion of the project area immediately north of Santa Fe Ave (Figure 3.7-1). Habitats within the project area include playas, dissected alluvial fans, and rolling hills. Soils are carbonate- rich, alkaline, sandy, or sandy clay loams. Four-wing saltbush is the dominant or co-dominant vegetation in the shrub canopy with creosote bush, white bur-sage, or allscale. Other shrubs include burrobush, spiny hopsage, sticky snakeweed, winterfat (*Krascheninnikovia lanata*), peach desert thorn, and bush seepweed (*Suaeda moquinii*). The shrub layer canopy is open or intermittent. The herbaceous

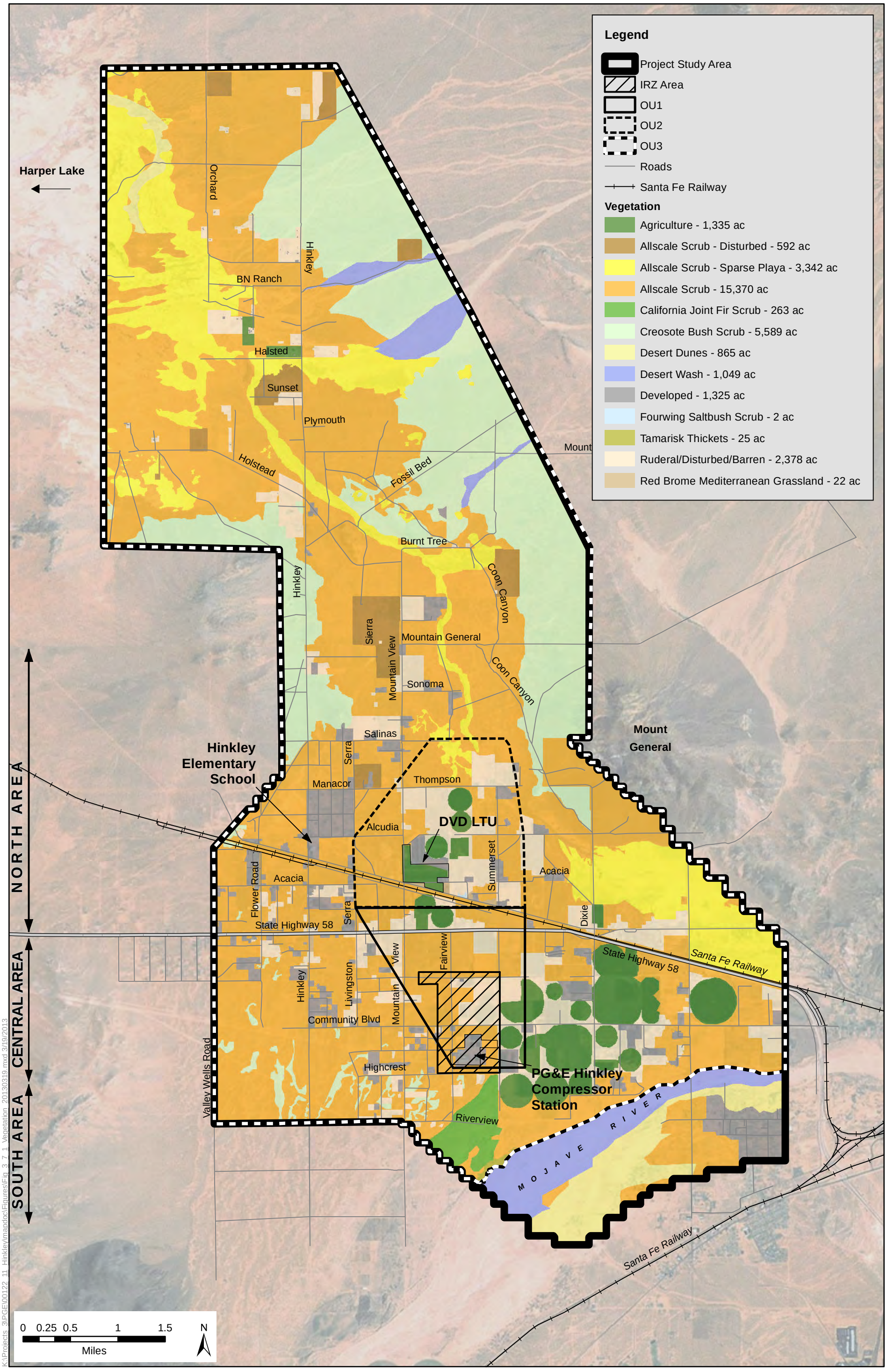


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**Figure 3.7-1**
**Existing Vegetation Communities**

Source: Based on information from PG&E 2011c; Based on field and Desktop (aerial) surveys conducted by ICF in 2011, 2012, 2013

layer is variable with seasonal herbs and non-native grasses such as galleta grass (*Pleuraphis rigida*), Indian ricegrass (*Stipa hymenoides*), red brome, cheat grass, and common Mediterranean grass.

## Creosote Bush Scrub

Creosote bush scrub is distributed in the northeastern and ~~south~~western portions of the project area; however, areas of Creosote Bush Scrub occur in the central and extreme southwestern portions of the project area (Figure 3.7-1). Habitats within the project area include alluvial fans, upland slopes, and minor intermittent washes with well-drained soils. This vegetation community is characterized by the presence of creosote bush as the dominant or co-dominant in the shrub canopy with four-wing saltbush, white bur-sage, or allscale. Other shrubs include burrobush, spiny hopsage, sticky snakeweed, California joint fir (*Ephedra californica*), and peach desert thorn. Canopy of the shrub layer is intermittent to open. The herbaceous layer is variable with seasonal annuals or perennial grasses such as galleta grass, Indian ricegrass, red brome, cheat grass, and common Mediterranean Grass grassland.

## California Joint Fir Scrub

This vegetation community is distributed in the southern portion of the project area (Figure 3.7-1). Habitats within the project area include intermittently flooded arroyos, washes, and adjacent alluvial fans. Soils are coarse to medium sands, loamy sands, and sandy clay loams. This vegetation community is characterized with California joint fir as the dominant or co-dominant in the shrub canopy with four-wing saltbush, white bur-sage, or allscale. Canopy of the shrub layer is open to intermittent. The herbaceous layer is variable with seasonal annuals or perennial grasses such as galleta grass, Indian ricegrass, red brome, cheat grass, and common Mediterranean grass.

## Desert Wash~~Mojave River Wash~~

Desert ~~Mojave River~~ wash is located in the southern portion of the project area associated with the Mojave River and in the northeastern portion ~~along the southern end~~ of the project area (Figure 3.7-1). The Mojave River and other desert washes are ~~area surrounding the Mojave River is~~ subject to annual rainfall events that can cause heavy flooding and scouring, thereby keeping the channel largely clear of vegetation.

## Desert Dunes

This vegetation community is located ~~distributed~~ adjacent and south of the Mojave River, as well as in the northwestern portion of the project area. These wind-blown sand formations range from sparsely vegetated to moderately vegetated. The aerial photography analysis revealed that this community can be highly variable on the amount of vegetation that is supported from year to year (based on major flood and wind events). Vegetative cover ranged from low to high~~moderate~~ during the field assessment for this EIR. The areas mapped in the northwestern portion of the project area are considered the minimum amount of desert dunes habitat that is present. Due to various stages of stabilization and that they can occur in fairly small patches, the desert dunes plant community can be difficult to map in the field. Therefore, the soils mapped as dune land (see Figure 5 in Appendix C) may also support this desert dunes plant community and should be considered when evaluating this plant community further.

### Tamarisk Thickets

This vegetation community is distributed within the Mojave River in the project area. This vegetation community is characterized by saltcedar (*Tamarix ramosissima*) as the dominant shrub. Canopy of the shrub layer is open and the herbaceous layer is sparse.

No remedial activities are proposed in this community.

### Red Brome or Mediterranean Grass Grassland Semi-Natural Herbaceous Stands

This vegetation community is distributed in the central portion of the project area north of Santa Fe Avenue and is characterized by red brome, common Mediterranean grass, or Arabian schismus (*Schismus arabicus*) as dominant or co-dominant with other non-natives in the herbaceous layer. Within the project area, these areas are typically on or adjacent to developed areas and/or have been exposed to anthropogenic disturbances including grazing and off-road vehicles.

### Ruderal/Disturbed/Barren

This vegetation community is distributed throughout the project area and characterized by mostly bare disturbed soils dominated by low growing ruderal (weedy) vegetation and few native species. This vegetation community is associated with anthropogenic disturbances, including agricultural practices, residential clearing and grubbing, refuse dumping, dirt roads, and powerline easements.

### Agriculture

Agricultural lands are distributed predominantly in the central and southern portions of the project area. There are both active or recently active agricultural fields and orchards currently in operation. These lands include the existing agricultural treatment units, which currently support alfalfa as well as Bermuda grass and Sudan grass.

### Developed

Developed areas are distributed throughout the project area. These areas have been physically altered and typically include hardscape features and adjacent land commonly observed in association with the various development types located within the project area (i.e., such as houses, yards, barns and stock ponds), as well as ornamental planting associated with such features.

## 3.7.3.2 Sensitive Natural Communities

Sensitive natural communities are those that are known to have limited distribution in the region, support special-status plant or wildlife species, or receive protection from local ordinances. The California joint fir scrub and desert dunes plant communities are located in the project area and listed by CDFG as high priority for inventory, which typically means they are rare. For this reason, these communities are considered sensitive natural communities.

No remedial activities are proposed within the area of California joint fir scrub. However, if freshwater wells and pipelines are constructed to provide fresh water for remedial activities, those wells and pipelines may be within areas of California joint fir scrub south of the PG&E Compressor Station. New freshwater wells and pipelines would be constructed to provide water supply for replacement of domestic or agricultural wells that might be affected by remediation. Remedial

activities may be proposed in desert dunes plant communities or dune land soils in the northwestern portion of the project area.

State and federal regulatory agencies also consider riparian habitats and wetlands to be sensitive and declining resources. No riparian habitat was observed within the project area during field surveys.

### 3.7.3.3 Common Species

The project area supports habitat for several common plant and wildlife species, Appendix C of the *Biological Resources Study* summarizes these species. Common species are able to adapt to changing environmental conditions and as such their population and distribution are readily available within large areas.

### 3.7.3.4 Biological Resources with Special Status

For the purpose of this document, special-status species are plants and animals are those that are legally protected under the federal ESA, CESA, or other regulations, as well as species considered sufficiently rare by the scientific community to qualify for such listing. Special-status species are defined as species that are:

- Llisted, proposed for listing, or candidates for listing under the federal ESA as threatened or endangered.~~;~~
- Llisted or candidates for listing under the CESA as threatened or endangered.~~;~~
- Llisted as rare under the Native Plant Protection Act.~~; and~~
- Aa~~a~~ state species of special concern or fully protected species.
- A state species of special concern is a species, subspecies, or distinct population of a fish, amphibian, reptile, bird, or mammal native to California that currently satisfies one or more of the following (not necessarily mutually exclusive) criteria:
  - is extirpated from the State or, in the case of birds, in its primary seasonal or breeding role;
  - is listed as Federally-, but not State-, threatened or endangered or meets the State definition of threatened or endangered but has not formally been listed;
  - is experiencing, or formerly experienced, serious (non-cyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for State threatened or endangered status; and/or
  - has naturally small populations exhibiting high susceptibility to risk from any factor(s) that, if realized, could lead to declines that would qualify it for State threatened or endangered status.
- A BLM sensitive animal, defined as (1) under status review by the UFWS/NMFS; or (2) whose numbers are declining so rapidly that Federal listing may become necessary, or (3) with typically small and widely dispersed populations; or (4) those inhabiting ecological refugia or other specialized or unique habitats. Existing California-BLM policy concerning the designation of sensitive species identifies two conditions that must be met before a species may be considered as BLM sensitive: (1) a significant population of the species must occur on BLM-

administered lands, and (2) the potential must exist for improvement of the species' condition through BLM management.

The California Native Plant Society (CNPS) maintains lists of plants as rare or endangered. Unless separately listed by the state or federal government the plants on the CNPS' lists are not formally protected in law. The CNPS lists are as follows:

- California Rare Plant Rank List 1A: plants presumed extinct
- California Rare Plant Rank List 1B: plants rare, threatened, or endangered in California and elsewhere
- California Rare Plant Rank List 2: plants rare, threatened, or endangered in California, but more numerous elsewhere
- California Rare Plant Rank List 3: plants about which more information is needed—a review list
- California Rare Plant Rank List 4: plants of limited distribution—a watch list

Plants listed on CNPS List 1A, 1B, or 2 meet the definition of Section 1901, Chapter 10 (Native Plant Protection Act) and Sections 2062 and 2067 (CESA) of the California Fish and Game Code. Thus, for the purposes of this EIR, plants on CNPS List 1A, 1B, or 2 are considered "rare" plants for the purposes of impact evaluation.

BLM sensitive plants are defined as plants found on BLM lands whose survival is of concern due to: 1) their limited distribution; 2) low number of individuals and/or populations; and 3) potential threats to habitat. Thus, for the purposes of this EIR, plants listed as BLM sensitive are considered "rare" plants for the purposes of impact evaluation.

Special-status species are thus also defined as including plant species with California Rare Plant Ranks (CRPR) of 1A, 1B, or 2 species, or BLM sensitive.

## State- and Federally-Listed Plants

One federally threatened plant species was identified as having potential to occur in the project area: Lane Mountain milk-vetch (*Astragalus jaegerianus*). A detailed species description is provided in the *Biological Resources Study* (Appendix C).

There likely are no state-listed endangered or threatened plant species with potential to occur in the project area.

### Lane Mountain Milk-Vetch

Lane Mountain milk-vetch is known to occur at three distinct locations north of Barstow on the slopes of Lane Mountain and within Paradise Valley (California Department of Fish and Game 2013~~1~~, Consortium of California Herbaria 2013~~2~~). Critical habitat for milk-vetch was designated on May 19, 2011. Critical habitat consists of the mixed desert scrub community within the range of milk-vetch that is characterized by shallow soils at elevations between 3,100 and 4,200 feet (945 to 1,280 m) and host shrubs at those same elevations (Final Revised Designation of Critical Habitat for *Astragalus Jaegerianus*, 76 Fed. Reg. 29,108, 29,127 (May 19, 2011) (to be codified at 50 C.F.R. pt. 17)). The designated critical habitat for milk-vetch is located several miles from the project area.

The project area provides potentially suitable desert scrub, which supports these plants; however, the project area is below the known elevation range of the species. Due to the close proximity of the

historical records and given the relatively large amount of desert scrub on the site, it was determined that Lane Mountain milk-vetch has a low to moderate potential to occur within the allscale and creosote scrub habitats within the project area, particularly on the eastern side of the project area in association with lower Coon Canyon and the western slopes of Mount General (see Figure 3.7-1). However, remedial activities are likely limited to the lower elevations of Hinkley Valley, which may limit potential to actually affect this species.

## Non-Listed Special-Status Plants

Non-listed special-status species are species that are not listed under the California Endangered Species Act or the federal Endangered Species Act, but are sufficiently rare to require special consideration and are either tracked in the California Natural Diversity Database (CNDDB) or designated as "sensitive" by the Bureau of Land Management. Thirteen non-listed special-status plants were identified in the literature search and habitat assessment as occurring in the vicinity of the project area (Consortium of California Herbaria 2013~~2~~, California Department of Fish and Game 2013~~1~~, California Native Plant Society 2013~~1~~). Based on observed conditions during the field survey, eight were determined to have a moderate or higher potential to occur within the project area:

- Clokey's cryptantha (*Cryptantha clokeyi*),
- Desert cymopterus (*Cymopterus deserticola*),
- Barstow woolly sunflower (*Eriophyllum mohavense*),
- Mojave menodora (*Menodora spinescens* var. *mohavensis*),
- Creamy blazing star (*Mentzelia* tridentata),
- Mojave monkeyflower (*Mimulus mohavensis*),
- Beaver Dam breadroot (*Pediomelum castoreum*), and
- Parish's phacelia (*Phacelia parishii*).

### Clokey's Cryptantha

Several collections of this species were made in the 1930s immediately north of Barstow; however, no new collections have been made in the area since (Consortium of California Herbaria 2013~~2~~, California Department of Fish and Game 2013~~1~~). Additionally, collections of the species were made in 2001 on Fort Irwin (Consortium of California Herbaria 2013, California Department of Fish and Game 2013). The project area supports potentially suitable desert scrub which can support this plant species. As such, it was determined that this species has low to moderate potential to occur within the project area, particularly in association with the allscale scrub habitat on the west facing slopes of Mount General.

### Desert Cymopterus

Several collections of desert cymopterus have been made within the ~~in the vicinity of the~~ project area, and the plant was observed in Spring 2013 in the project area (Strohl 2013). In particular, desert cymopterus was collected throughout the Water Valley quadrangle and on both the east and west side of Hinkley Road in 2000 and 2001 ~~north of the project area east of Harper's Dry Lake~~ (Consortium of California Herbaria 2013~~2~~; California Department of Fish and Game 2013~~1~~). The project area supports potentially suitable desert scrub. As such, given that this species was collected

within ~~due to the close proximity of Harper's Dry Lake to~~ the project area~~,~~ and the relatively large amount of desert scrub habitat on site, it was determined that this species has moderate to high potential to occur in the allscale and creosote scrub habitats within the project area.

**Barstow Woolly Sunflower**

Several collections of this species have been made east and west ~~north~~ of the project area ~~near Barstow~~ (Consortium of California Herbaria 2013~~2~~; California Department of Fish and Game 2013~~1~~). The project area supports potentially suitable allscale and creosote scrub and playa habitat for this species. As such, it was determined that this species has moderate to high potential to occur within the allscale scrub, ~~and~~ creosote scrub and playa habitats in the project area.

**Mojave Menodora**

This species has been collected both north and south of the ~~northeast of the~~ project area ~~at the highpoint of Waterman Hills~~ (Consortium of California Herbaria 2013~~2~~; California Department of Fish and Game 2013~~1~~). The project area supports potentially suitable desert scrub habitat. As such, it was determined that this species has low to moderate potential to occur on site within the allscale and creosote scrub habitats, particularly the eastern portion of the project area associated with the western slopes of Mount General.

**Creamy Blazing Star**

This plant has been recorded as occurring within the project area just north of the intersection of Hinkley Road and Burnt Tree Road. The occurrence record is from two collections made in 1922. In addition this plant has been recorded as occurring ~~collected~~ east of the project area in the Waterman Hills (Consortium of California Herbaria 2013~~2~~; California Department of Fish and Game 2013~~1~~). The project area supports potentially suitable desert scrub in association with rocky, gravelly, and sandy substrates. As such, it was determined that this species has a moderate potential to occur within the project area in the allscale and creosote scrub habitats, particularly the eastern portion of the project area associated with the western slopes of Mount General and the area surrounding the intersection of Hinkley and Burnt Tree Road.

**Mojave Monkeyflower**

This species is known to occur in the project area from a single 1941 collection. This collection was made just east of the intersection of Lenwood Road and Santa Fe Avenue on the eastern side of the project area. Several other occurrences are mapped in the vicinity of the project area (Consortium of California Herbaria 2013; California Department of Fish and Game 2013~~2011~~). The project area supports potentially suitable rocky to sandy desert scrub. As such, it was determined that this species has moderate to high potential to occur on the site in the allscale and creosote scrub as well as in the desert dunes and desert wash ~~Mojave river wash~~ habitats within the project area.

**Beaver Dam Breadroot**

Several collections of this species have been made both south and east of the project area (Consortium of California Herbaria 2013~~2~~; California Department of Fish and Game 2013~~1~~). The plant was observed during the Spring 2013 surveys in the project area (Strohl 2013). The project area supports potentially suitable desert scrub. As such, it was determined that this species has a moderate potential to occur within the allscale and creosote scrub habitat in the project area.

### Parish's Phacelia

Several collections of this species have been made east and south of the project area in the vicinity of Barstow (Consortium of California Herbaria 2013~~2~~; California Department of Fish and Game 2013~~1~~). The project area contains potentially suitable desert scrub and playa habitat. As such, it was determined that this species has low to moderate potential to occur within the allscale and creosote scrub habitats within the project area.

## State- and Federally Listed Wildlife

~~Six~~ Seven federally and/or state-listed threatened and endangered wildlife species have a potential to occur within the geographical vicinity of the project area based on background research (California Department of Fish and Game 2013~~1~~) but only two were determined to have some potential to occur based on observed conditions during the field evaluation. These were the desert tortoise and the Mohave ground squirrel. Detailed species descriptions are provided in the *Biological Resources Study* (Appendix C).

### Desert Tortoise

The Mojave population of desert tortoise (*Gopherus agassizii*) was listed as threatened under the federal Endangered Species Act on April 2, 1990 (U.S. Fish and Wildlife Service 1990) and was listed as threatened under the California Endangered Species Act in 1989. Throughout most of the Mojave Desert, tortoises occur most commonly on gently sloping terrain with sandy-gravel soils and where there is sparse cover of low-growing shrubs, which allows establishment of herbaceous plants. Soils must be loose enough for digging of burrows, but firm enough so that burrows do not collapse.

The project area partially overlaps portions of the Superior-Cronese DWMA, which is designated by BLM as Areas of Critical Environmental Concern (ACEC) (Figure 3.7-2), and is located within the western recovery unit for desert tortoise (U.S. Fish and Wildlife Service 2011a).

Desert tortoise is thought to have the potential to occur throughout the project area (California Department of Fish and Game 2011) (Figure 3.7-3). CNDDB also included two locations for desert tortoise sightings: one occurring just east of the project area on the western slopes of Mount General, and the second occurring west of the project area on the east side of Indian Wells Road just north of State Highway 58 (Hwy 58). In addition, during the January 14, 2013, site visit, a small complex of desert tortoise burrows and one old desert tortoise scat was observed in the northern portion of the project area (Figure 3.7-3).

Desert tortoise observation data were also provided by PG&E ~~by Haley & Aldrich on February 15, 2012, based on biological surveys completed by PG&E in the project area~~ (Pacific Gas and Electric Company 2012a). It is noted that some of the observed desert tortoise could be domesticated individuals (not wild). Figure 3.7-3 shows these desert tortoise sightings.

Based on the habitat conditions within the project area and the previous desert tortoise locations, the desert tortoise was determined to have low to high potential to occur throughout the undeveloped portions of the project area, with some areas being occupied by the species where signs of tortoise and desert tortoise have been observed. Figure 3.7-2 shows a broad overview of the suitability of the habitat based on the following breakdown of mapped plant communities: moderate-quality to high-quality suitable habitat includes allscale scrub, allscale scrub—sparse playa, allscale scrub—disturbed, fourwing saltbush scrub, creosote bush scrub, and California joint fir scrub and the desert dunes located in the northern portion of the project area; low-quality

suitable habitat includes~~, Mojave River wash,~~ the desert dunes in the southern portion of the project area, tamarisk thickets, red brome or Mediterranean grass grassland, semi-natural herbaceous stands, and ruderal/disturbed/barren; unsuitable desert tortoise habitat includes developed and agriculture areas.

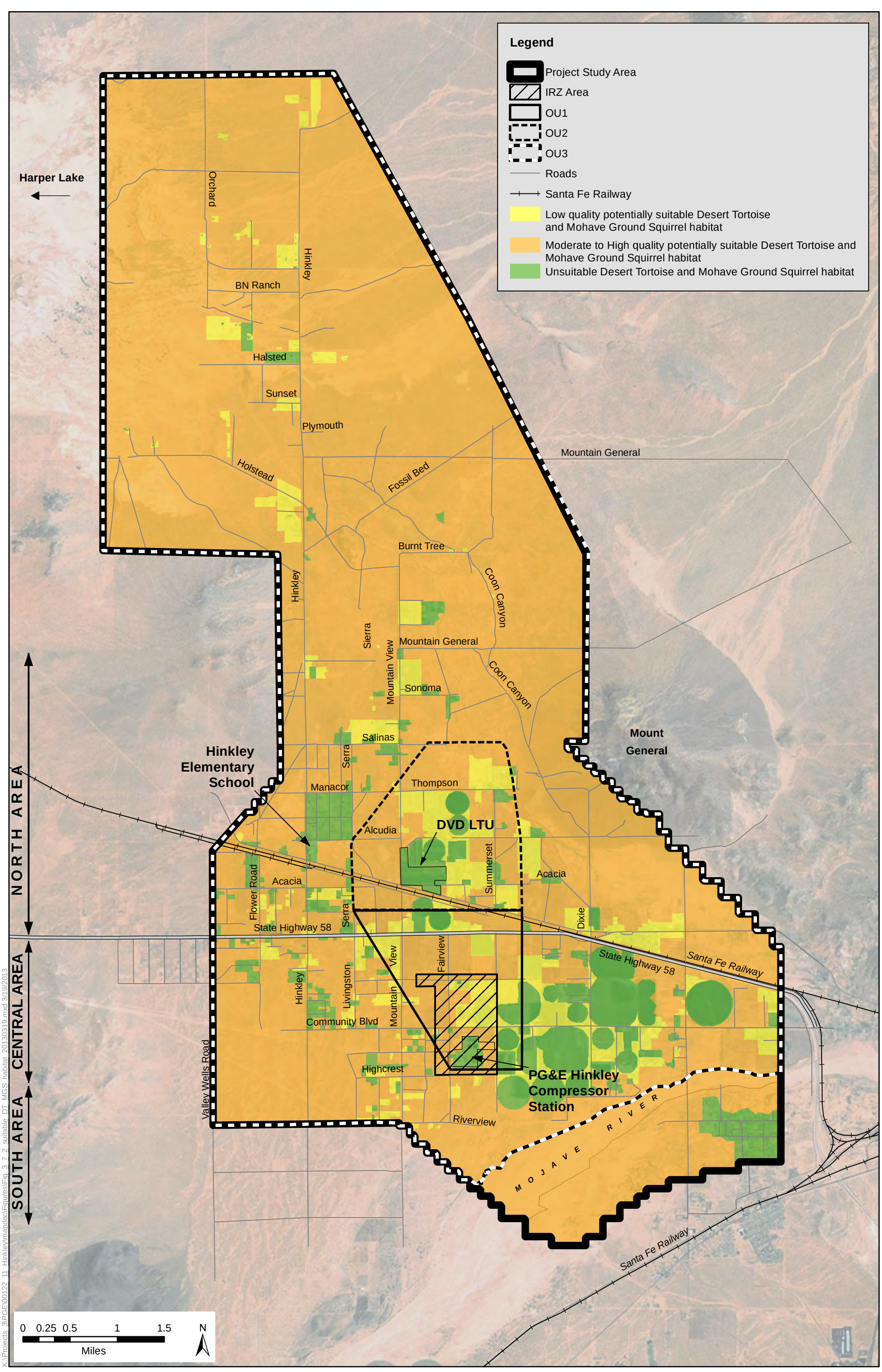
Vegetation communities considered to have a low potential lack the quantity and quality of characteristics typically associated with occupied desert tortoise habitats. For example, desert tortoise require a burrowing substrate; however, communities such as desert washes and the southern desert dunes associated with the Mojave River ~~Wash and desert dunes~~ are dynamic and may lack stabilized soils suitable for burrowing, although burrowing remains possible in these areas. Although these conditions might preclude an occupied burrow, foraging and movement may occur. In addition, desert washes that are infrequently inundated could support desert tortoise burrows. Other vegetation communities within the project area, such as tamarisk thickets, red brome or Mediterranean grass grasslands, semi-natural herbaceous stands, and ruderal/disturbed/barren, are of such poor quality in terms of foraging material, soils, and magnitude of disturbances that occupation might be precluded or occur at a low level. However, if these low-quality habitats are located adjacent to and interspersed with moderate- to high-potential vegetation communities, as is the case in the project area, the likelihood of occurrence is increased.

Critical habitat for the desert tortoise was designated in 1994. This critical habitat consists of the following primary constituent elements: (1) sufficient space to support ~~-~~viable populations and provide for movements, dispersal~~,~~ and gene flow; (2) sufficient quantity and quality of forage species and the proper soil conditions to provide for the growth of such species; (3) suitable substrates for burrowing, nesting, and overwintering; (4) burrows, caliche caves, and other shelter sites; (5) sufficient vegetation for shelter from temperature extremes and predators; and (6) habitat protected from disturbance and human-caused mortality. Designated critical habitat for the desert-tortoise encompasses portions of the Mojave and Colorado Deserts (59 Fed. Reg. 5,820, 5,822 (Feb. 8, 1994)). Based on a review of USFWS Critical Habitat documentation and maps, critical habitat for the desert tortoise is mapped within a small portion of the project area located on the eastern boundary just south of Mount General and in the extreme northern portion of the project area (Figure 3.7-2) (U.S. Fish and Wildlife Service 2011b).

**Mohave Ground Squirrel**

Mohave ground squirrel (*Xerospermophilus mohavensis*) was listed as threatened under CESA in 1993. There is currently no federal listing for this species. The Mohave ground squirrel does not appear have a plant community preference, as it occurs in the exact proportion as the distribution of plant communities within its range (Bureau of Land Management 2005). The plant communities with the highest percentage of occurrence and therefore the highest percentage of Mohave ground squirrel occurrence are Mojave creosote brush scrub, desert saltbush scrub, and Mojave mixed woody scrub (Bureau of Land Management 2005). The Mohave ground squirrel is absent from steep, very rocky areas and playas (i.e., a sandy, salty, or mud-caked flat floor of a desert drainage basin that is periodically covered with water). Soil characteristics are important because Mohave ground squirrels construct burrows to shelter from temperature and humidity extremes, to escape predators, and to give birth (U.S. Fish and Wildlife Service 2010a).

Mohave ground squirrel has been recorded nearby and in the project area. The CNDDB lists two historic records for this species as occurring within the Barstow, Hinkley and Water Valley USGS quads (California Department of Fish and Game 2013~~1~~). One record dated 1982 is from the Barstow




K:\Projects_3\PGE\00122_11_Hinkley\mapdoc\Figures\Fig_3_7_2_suitable_DT_MGS_habitat_20130319.mxd 3/19/2013

Source: Based on information from PG&E 2011c; Based on field and Desktop (aerial) surveys conducted by ICF in 2011, 2012, 2013

**Figure 3.7-2**
**Suitable Desert Tortoise and Mohave Ground Squirrel Habitat**

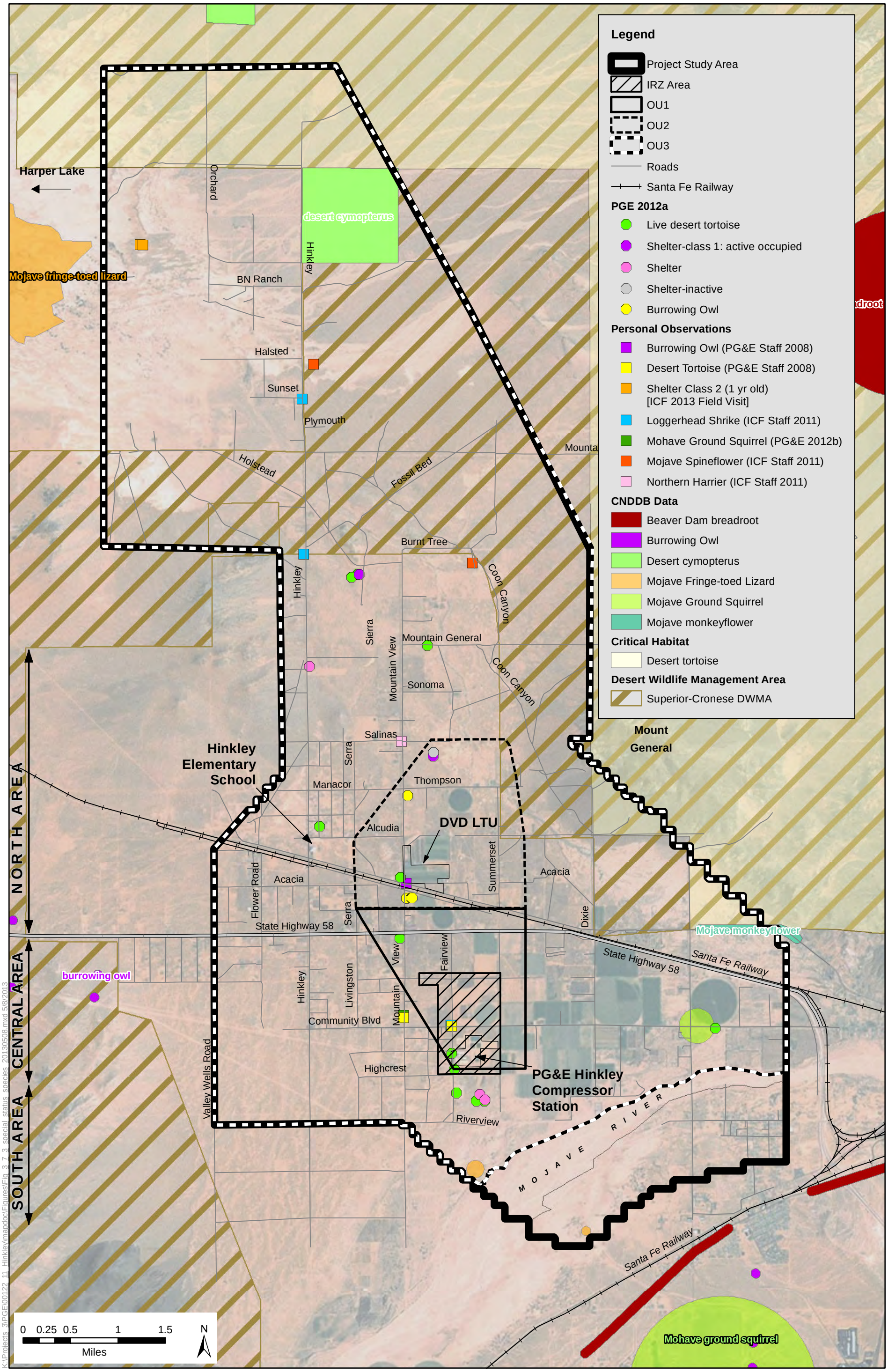



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**Figure 3.7-3**
**Special-Status Species Occurrences**

Source: Based on information from PG&E 2011c; USFWS 2013; BLM 2005; CNDDB 2013; PG&E 2012a/b; Based on field surveys conducted by ICF in 2011 and 2013

area, where one Mohave ground squirrel was detected just northwest of the Fort Irwin Road/SR 58 junction. A second report dated 1990 was recorded as occurring within the project area at the junction of Lenwood Road and Community Boulevard (Figure 3.7-3) where allscale scrub was mapped during this habitat assessment. This record states that an unknown number of individuals were recorded in the area between March 1 and April 30. A biological consultant working for PG&E ~~biologists observed~~ reported an animal that was potentially a Mohave ground squirrel in early 2012 near Frontier Road within the project area (Pacific Gas and Electric Company 2012b). Finally, Leitner (2008) describes a non-specific location of Mohave ground squirrel detected at the edge of an alfalfa field near Harper Dry Lake. Due to the historic records and the presence of suitable habitat, it is concluded that Mohave ground squirrel has the potential to occur throughout the project area.

## Non-Listed Special-Status Wildlife

There are five non-listed special-status species with potential to occur within the project area (California Department of Fish and Game 2013~~1~~) (Appendix C). Burrowing owl, loggerhead shrike, northern harrier, American badger (*Taxidea taxus*), Mojave river vole(*Microtus californicus mohavensis*), and Mojave fringe-toed lizard were determined to have moderate to high potential for occurrence based on current habitat conditions within the project area. Non-listed special-status species detected within the project area during field surveys in December 2011 and 2013 include loggerhead shrike and northern harrier. Detailed species descriptions are provided in the *Biological Resources Study* (Appendix C). These species are summarized below.

### Burrowing Owl

Burrowing owl is designated a California species of special concern by CDFG and a BLM sensitive species. The burrowing owl requires habitat with three basic soil and vegetal attributes: open, well-drained terrain; short, sparse vegetation; and underground burrows or burrow-like openings. Throughout their range, most burrowing owls rely on burrows excavated by ground squirrels, badgers, foxes, desert tortoise, and coyotes.

Burrowing owls have been recorded in the vicinity of the project area, with several recorded to the west and south of the project area in 2007 (California Department of Fish and Game 2013~~1~~). They have also been observed within the project area near the intersection of Acacia Street and the Santa Fe Railroad (Knutson pers. comm.). In addition, burrowing owl occurrence data were provided by PG&E ~~Haley & Aldrich on February 15, 2012, based on biological surveys implemented by PG&E and~~ conducted by CH2MHill in the project area (Pacific Gas and Electric Company 2012a) (see Figure 3.7-3).

The majority of the project area (outside of developed areas but including alfalfa fields) provides low- to high-quality foraging habitat for this species, and any areas with suitable burrows would provide potential nesting habitat, shelter, and refuge. Alfalfa fields can provide high-quality foraging habitat for burrowing owl: such fields might be particularly attractive to burrowing owl as foraging areas in the project area.

### Loggerhead Shrike

Loggerhead shrike is designated a species of special concern by CDFG only when nesting. All other non-nesting occurrences of loggerhead shrike are not considered sensitive. Loggerhead shrikes breed mainly in shrublands or open woodlands with a fair amount of grass cover and areas of bare

ground. They require tall shrubs or trees (and also use fences or power lines) for hunting perches, territorial advertisement, and pair maintenance; open areas of short grasses, forbs, or bare ground for hunting; and large shrubs or trees for nest placement. They also need impaling sites for prey manipulation or storage; such sites can include sharp, thorny, or multi-stemmed plants and barbed-wire fences (Yosef 1996). Nests are generally well hidden in taller shrubs or low in trees, and are often located in areas where there is a break in the landscape, such as at the base of slopes or edge of a woodland or clump of trees (Yosef 1996).

The literature search provided two observation records for loggerhead shrikes located south of Harper Dry Lake ~~approximately six miles east of the project area~~ (California Department of Fish and Game 201~~3~~1). During the December 20, 2011 field survey, ICF staff observed loggerhead shrikes in two separate locations in the northern portion of the project area along Hinkley Road (Figure 3.7-3). These individuals were observed perched on the overhead telephone line located on the west side of Hinkley Road and appeared to be foraging to the east within the project area.

The majority of the project area (outside of the developed areas) provides high-quality foraging and nesting habitat for loggerhead shrike.

**Northern Harrier**

Northern harrier is designated a species of special concern by CDFG only when nesting. All other non-nesting occurrences of northern harrier would not be considered to be sensitive. This species is known to breed and forage in a variety of habitats that provide appropriate vegetation cover, abundance of prey and suitable perch sites (Gardali and Shuford 2008). These habitats typically include fresh, brackish, and saltwater marshes; meadows, lake margins, rivers, and streams; grasslands, open fields, pastures, and some croplands such as alfalfa and grain; sagebrush flats, and desert sinks (Gardali and Shuford 2008). The northern harrier is a ground-nesting bird and often nests within areas of dense, tall undisturbed vegetation. The northern harrier preys on a variety of small- to medium-sized vertebrates such as rodents and passerines.

During the field survey, a single male northern harrier was observed within the northern portion of the project area at the intersection of Mountain View Road and Tindall Road (Figure 3.7-3). Gardali and Shuford (2008) conclude that while northern harrier is historically known to breed northwest of the project area at Harper's Dry Lake, no breeding activity has been observed at the lake since the mid-1990s. It is possible that northern harriers might occasionally nest in agricultural areas in the West Mojave (Garrett and Molina undated).

The majority of the project area provides suitable foraging habitat for the northern harrier. Suitable nesting habitat in the project area is nearly absent due to the lack of dense, tall-undisturbed vegetation, although the agricultural areas may provide suitable nesting habitat.

**American Badger**

American badger is also designated a species of special concern by CDFG that is most abundant in drier open stages of most shrub and herbaceous habitats, with friable soils (Ahlborn 1988–1990). Badgers dig burrows in friable soil for cover and frequently reuse old burrows, although some may dig a new den each night, especially in summer (Messick and Hornocker 1981). Long (1973) and Jager et al. (2006) have shown that badgers are born approximately in late March and early April and leave the natal den in late June and early July.

The literature search provided two observation records for American badger located approximately 2.5 and 3 miles west of the project area and north of Hwy 58 (California Department of Fish and Wildlife 2013).

The majority of the project area (outside of developed areas) provides moderate quality foraging and denning habitat for this species.

### Mojave River Vole

Mojave River vole is designated a species of special concern by CDFG. This species occurs in habitat that is moist, including meadows, freshwater marshes, and irrigated pastures, in locations in the vicinity of the Mojave River. Suitable habitat is associated with ponds and irrigation canals along with the Mojave River proper, as well as adjacent irrigated land, such as alfalfa fields (Williams 1986). In the Mojave River, this vole has been recorded in cattail marsh/wetland habitat that is subjected to annual flooding and riparian-associated habitats that provide refuge during annual flooding. They also utilize adjoining upland habitat during unusually high water levels.

The closest recorded location of Mojave River vole is 7 miles to the northwest of the project area (California Department of Fish and ~~Game~~ Wildlife 201~~3~~4). The closest suitable native habitat in the Mojave River (based on aerial photography analysis) appears to be approximately 5 miles to the southwest. Alfalfa fields located 1.6 miles southwest of the Mojave River could provide suitable habitat for this vole.

The observed areas of the Mojave River that occur in the project area provide do not provide suitable moist habitats for the Mojave River vole. However, numerous areas of alfalfa fields and other fallow fields in close proximity to the Mojave River could provide suitable habitat. Within the project area, irrigated land in pasture or used to grow alfalfa have low potential to support Mojave River vole.

### Mojave Fringe-Toed Lizard

Mojave fringe-toed lizard is designated a~~n~~ species of special concern and a BLM sensitive species. This species is restricted to areas with fine, aeolian sand (or sands that are ~~formed~~ deposited by winds), including both large and small dunes, margins of dry lakebeds and washes, and isolated pockets against hillsides. These areas are generally within creosote scrub desert between elevations of 300–3,000 feet (90–10 m). Sand dune ecosystems, including their source sand and sand corridors, are necessary for the long-term survivorship of aeolian sand specialists, such as fringe-toed lizards (Barrows 1996). Breeding activity occurs between April and July (Mayhew 1964). Females lay 1 to 5 eggs in hummocks or sandy hills during the months of May through July. Hatchlings appear in September (Miller and Stebbins 1964).

As shown in Figure 3.7-3, Mojave-fringe-toed lizards were recorded at two locations in the southwestern portion of the project area in 2010 (California Department of Fish and Wildlife 201~~3~~4), specifically within California joint fir scrub and desert dunes communities (Figure 3.7-1).

Based on information in recent records, areas within the project study area classified as California joint fir scrub, desert dunes, and the intervening desert ~~Mojave river~~ wash are considered highly suitable habitat for Mojave-fringe-toed lizards. In addition, soils mapped as dune land (see Figure 5 in Appendix C) may also support Mojave fringe-toed lizard.

## Other Wildlife Species

### Raptors

A variety of raptor species were observed during the field survey, including red-tail hawk (*Buteo jamaicensis*), prairie falcon (*Falco mexicanus*) and American kestrel (*Falco sparverius*). The primary agricultural crop grown in the project study area is alfalfa, which has been shown to have a positive relationship with raptor species such as Swainson's hawk (Smallwood 1995, Pandolfino et al. 2011). Due to the relatively open nature of the desert scrub within the project area in combination with the patchwork of active agricultural and non-active disturbed fields, the project area was determined to provide quality foraging opportunities for raptor species in the region.

### Desert Kit Fox

Desert kit fox occurs in desert areas with annual grasslands or grassy open stages of vegetation dominated by scattered brush, shrubs, and scrub. Cover is provided by dens that are dug in open, level areas with loose-textured, sandy and loamy soils. Egoscue (1962) reports that most pups born February through April, following a gestation period of 49 to 55 days.

The majority of the project area (outside of developed areas) provides moderate quality foraging and denning habitat for this species.

## 3.7.3.5 Wildlife Corridors

The open nature of the project area provides the opportunity for wildlife movement. The species expected to move across the project are include small- to medium-sized mammals, birds, and reptiles, including the desert tortoise and Mohave ground squirrel. Wildlife movement is expected to be higher along the natural corridors of the project area, such as the east-west corridor along the Mojave River. Additionally, the large open areas of desert scrub habitat provide relatively unrestricted movement across the project area.

## 3.7.3.6 Jurisdictional Waters

~~The only s~~Surface waters in the project area are the Mojave River, small desert washes that flow south to the Mojave River, and desert washes that flow north and west to Harper Lake. In addition, the Harper Lake playa's potential jurisdictional boundary could overlap the northwestern portion of the project area. As described in Section 3.1, *Water Resources and Water Quality*, nearly all of the project area where remedial activities would occur drain to the north. In addition, tributary washes collect to a desert wash in the center of the Hinkley Valley where water collects during infrequent large rain events and flows to Harper Lake. Harper Lake is a dry lake except immediately during and after storm events and surface water either evaporates or percolate.

Tributaries to the Mojave River may be waters of the United States, but no jurisdictional determination for the project has been prepared to date (delineations and determinations are usually done at the permitting phase following CEQA). The U.S. Army Corps of Engineers has previously determined that the Mojave River is a water of the United States, but has not made a formal determination relative to this project. Drainages to Harper Lake, which are the bulk of the drainages in the project area, are considered state waters and are subject to state jurisdiction under the Porter-Cologne Water Quality Control Act. The U.S. Army Corps of Engineers has previously determined that Harper Lake and tributaries to it are not waters of the United States.

As described in Section 3.1, *Water Resources and Water Quality*, historic agricultural pumping resulted in a drop in groundwater levels in both the Hinkley Valley and Harper Valley. Groundwater levels in the Hinkley Valley are often 75 feet or more below ground surface which is too deep to support wetlands or other surface vegetation. Groundwater levels in the Harper Valley also dropped significantly due to historic agricultural pumping, such that groundwater in the Harper Valley no longer supports surface waters or wetlands. Remnant wetlands associated with Harper Lake (on the west, north, and south edges of the lake far outside the project study area) only persisted due to surface runoff from agricultural irrigation after being cut off from the water table. As agricultural activities in Harper Valley declined in the 1990s, the Harper Lake wetlands were completely dry between 1998 and 2001. BLM subsequently has been artificially maintaining the central and southern wetlands along Harper Lake by pumping groundwater via underground pipes and a surface drainage channel (California Public Utilities Commission 2010).

## 3.7.4 Significance Criteria

The State CEQA Guidelines Appendix G (14 CCR 15000 et seq.) have identified significance criteria to be considered when determining whether a project could have significant effects on existing biological resources within the project area. For this analysis, an impact pertaining to biological resources was considered significant under CEQA if it would result in:

- A substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by DFG or USFWS.
- A substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by DFG or USFWS
- A substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marshes, vernal pools, etc.) through direct removal, filling, hydrological interruption, or other means.
- Substantial i~~I~~nterference ~~substantially~~ with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.~~; or~~
- Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

## 3.7.5 Methodology

The significance criteria listed above were used to determine whether an impact would be significant. The entire area of Operable Unit 3 (OU3, including OU1 and OU2) was considered the geographical extent of physical disturbance related to remedial actions. Potential effects on special-status species and natural communities within the project area were evaluated according to the highest likelihood of occurrence of each resource.

The impact analysis compares all project alternatives to existing conditions, which is the CEQA baseline. Both direct and indirect impacts to biological resources were considered in the analysis. Direct impacts are those impacts that are caused by the project and occur at the same time and place

as the actions that may cause the impacts (Cal. Code Regs § 15358). Indirect impacts are impacts caused by the project and are later in time or farther removed in distance from the actions that cause the impacts, but are still reasonably foreseeable (Cal. Code Regs. § 15358). For example, indirect impacts include changed land conditions that induce foreseeable physical effects on natural systems including ecosystems.

In OU1 and OU2 where the footprint for remedial activities was defined in the Feasibility Study/Addenda, spatial analysis was used to identify habitat impacts for the desert tortoise and Mohave ground squirrel (as noted above many of the other wildlife species have habitat requirements that overlap with these two species). Spatial data based on the Ffeasibility Sstudy/Aaddenda alternative designs was used to estimate the habitat impacts of the agricultural units, pipelines and wells for all alternatives. The Feasibility Study/Addenda documents only included activities in OU1 and OU2 to address the plume as it existed in February 2011. In order to account for the expansion of infrastructure to address the potential expansion of the plume ~~(assumed to be 15% larger than the Q4/20122011 plume)~~, additional acreage was added to the Feasibility Study/Addenda spatial data based on the total infrastructure amounts by alternative (as summarized in Chapter 2, *Project Description*) including acreage for agricultural units, piping, wells and roads. For the expansion areas or where spatial data was not available, two scenarios were used. The first scenario assumed the character of the vegetation communities/species habitat in the expansion areas would have the same percentage habitat characteristics as in the areas identify by the Feasibility Study/Addenda spatial data~~)~~. The second scenario assumed that the expansion areas would all be suitable, moderate to high quality suitable species habitat and is the worst-case scenario. The worst-case scenario may overstate the level of impact to areas of habitat for the desert tortoise and Mohave ground squirrel as some areas of low quality habitat and unsuitable habitat occur within areas where potential infrastructure may be constructed as shown in Figure 3.7-2 but this range is thought to be appropriate for disclosure purposes in this EIR. Table 3.7-3 shows the estimated vegetation community impacts by type, using a proportional scaled scenario.

Due to the long timeframe required when restoring vegetation and soil characteristics in the desert, all areas of disturbance are assumed to be permanent impacts to habitat. In addition, since the action alternatives all have 30 to 40 year durations or longer and new infrastructure will require maintenance over the duration of remedial activities, for the purposes of the impact analysis it is reasonable to assume permanent loss of habitat where disturbance of native habitats is necessary.

**Table 3.7-3. Potential Vegetation Impacts by Community, Proportional Scaled Scenario (Acres)**

| | Allscale Scrub (all types) | Fourwing Saltbush Scrub | Ruderal/ Disturbed/ Barren | Agricultural | Developed | Total |
|---|---|---|---|---|---|---|
| No Project Alternative | 4 | 0 | 3 | 0 | 1 | 9 |
| Alternative 4B | 33 | 1 | 247 | 6 | 17 | 304 |
| Alternative 4C-2 | 292 | 0 | 130 | 2 | 10 | 434 |
| Alternative 4C-3 | 301 | 0 | 136 | 2 | 11 | 450 |
| Alternative 4C-4 | 831 | 0 | 446 | 1 | 1 | 1,278 |
| Alternative 4C-5 | 294 | 0 | 131 | 1 | 10 | 436 |

Notes:

Totals may not add due to rounding.

For the action alternatives, the areas of potential impact were scaled up from footprint acres from the Feasibility Study/Addenda spatial data as described in the methodology. Thus, for the action alternatives, these acreages will not match the footprint areas shown in Figures 3.7-5 through 3.7-9 as the figures only show the areas identified based on Feasibility Study/Addenda spatial data. Areas scaled up were assumed to contain the same proportion of vegetation communities as in the Feasibility Study/Addenda spatial data.

It should be noted that the project may affect other native vegetation types present within the project area overall (such as creosote bush scrub, California joint fir scrub) and non-native vegetation types (such as tamarisk thickets, or red brome or Mediterranean grass grassland and semi-natural herbaceous stands). These vegetation types are not present within the disturbance areas based on the Feasibility Study/Addenda spatial data, but may nevertheless be affected by remedial actions in the expansion area.

After the calculations were completed for the Final EIR, updated information on the number of existing monitoring wells was received (see Appendix B). Since the scaling approach to estimating future monitoring wells was based on an escalation from the existing number of monitoring wells (as shown in Appendix B), the estimate of future monitoring wells also would increase. However, the vegetation impact assessment shown above did not include the revised escalated monitoring well estimate. This would only change the analysis in minor ways. For instance, the amount of land disturbed due to monitoring well installation would only change by perhaps 3 acres if the escalated revised estimate were used. Given that the land disturbance of all of the action alternatives on the scale of several hundred acres or more, this minor change would not change the conclusions of the EIR.

For the No Project Alternative, disturbance areas based on existing conditions plus additional areas based on current plans for remediation.

## 3.7.6 Impacts

This section provides the impact analysis and mitigation measures related to biological resources. The impacts are organized by topic, which correspond with the significance criteria.

### 3.7.6.1 Special-Status Species

**Impact BIO-1a: Disturbance, Mortality, and Loss of Habitat for Desert Tortoise (Less than Significant with Mitigation, No Project Alternative; Significant and Unavoidable for Tortoise Movement, All Action Alternatives)**

#### Overview of Impact

The proposed remediation activities under all alternatives have the potential to remove habitat that supports the federally protected desert tortoise thereby resulting in potentially significant impacts. Desert tortoise habitat is distributed throughout the project area (as shown in Figure 3.7-2). As explained in section 3.7.5.5 above, critical habitat has been designated for the desert tortoise.

Both construction-related and operations and maintenance activities may contribute to potentially significant impacts that could result in the loss of desert tortoise individuals and removal of desert tortoise habitat. Specifically, these impacts to desert tortoise could occur to potentially occupied burrows as a result of collision, crushing, entrapment, and removal of habitat due to human activities during project implementation.

Table 3.7-4a and Table 3.7-4b below summarize the potential acreages of habitat loss of this species under all alternatives, and Figures 3.7-4 through 3.7-9 show the habitat impact areas of each alternative. These acreages are scaled to capture the potential extent of both known and unknown areas where remediation activities could occur, including potential future activities (as described above in the methodology). In the text below the tables, only the worst-case acreages are cited.

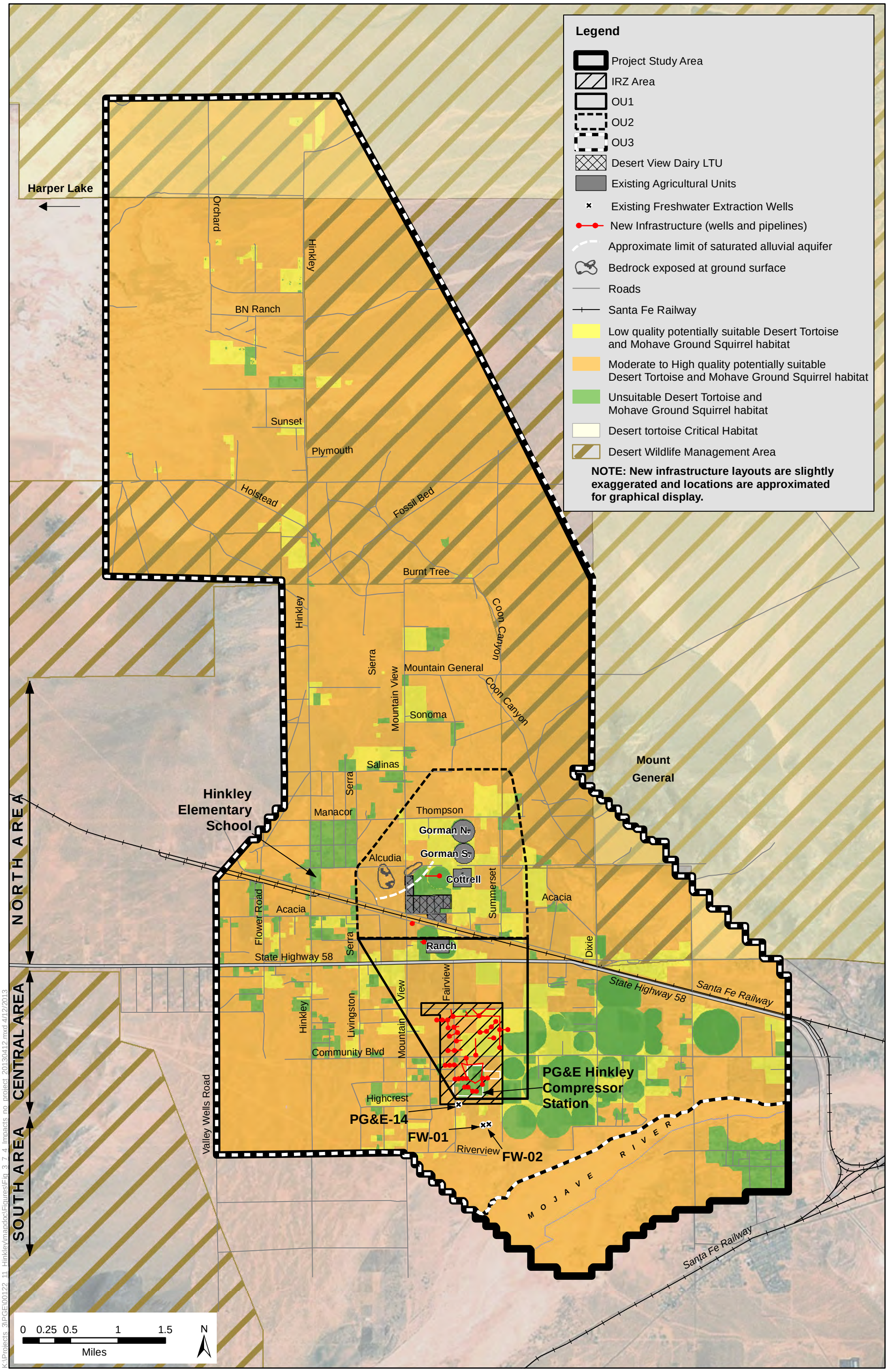
**Table 3.7-4a. Potential Desert Tortoise and Mohave Ground Squirrel Habitat Impacts, Proportional Scaled Scenario (Acres)**

| Alternative | Suitable, Low Quality | Suitable, Moderate to High Quality | Total Habitat (low, Moderate, High) | Unsuitable |
|---|---|---|---|---|
| No Project Alternative | 3 | 5 | 7 | 2 |
| Alternative 4B | 247 | 34 | 281 | 23 |
| Alternative 4C-2 | 130 | 292 | 423 | 12 |
| Alternative 4C-3 | 136 | 301 | 437 | 13 |
| Alternative 4C-4 | 446 | 831 | 1,276 | 1 |
| Alternative 4C-5 | 131 | 294 | 425 | 11 |

Notes:

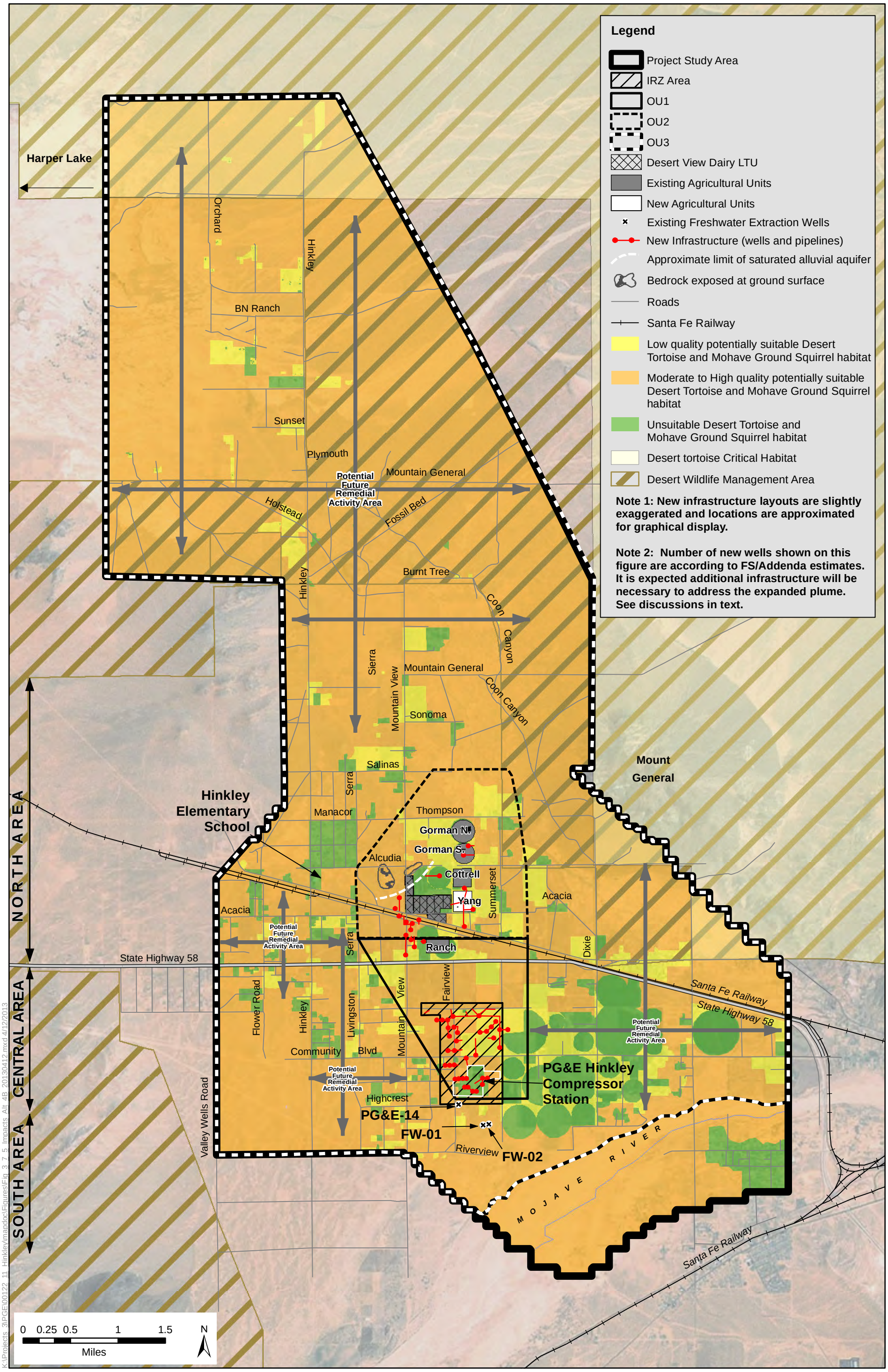
Totals may not add due to rounding.

For the action alternatives, the areas of potential impact were scaled up from footprint acres from the Feasibility Study/Addenda spatial data as described in the methodology. Thus, for the action alternatives, these acreages will not match the areas shown in Figures 3.7-5 through 3.7-9 as the figures only show the areas identified based on Feasibility Study/Addenda spatial data. Areas scaled up were assumed to contain the same proportion of habitat types (unsuitable, low quality, moderate to high quality) as in the Feasibility Study/Addenda spatial data.




Source: Based on information from PG&E 2011c; USFWS 2013; BLM 2005; Based on field and Desktop (aerial) surveys conducted by ICF in 2011, 2012, 2013

**Figure 3.7-4**
**No Project Alternative Potential Areas of Direct Impacts to Biological Resources**

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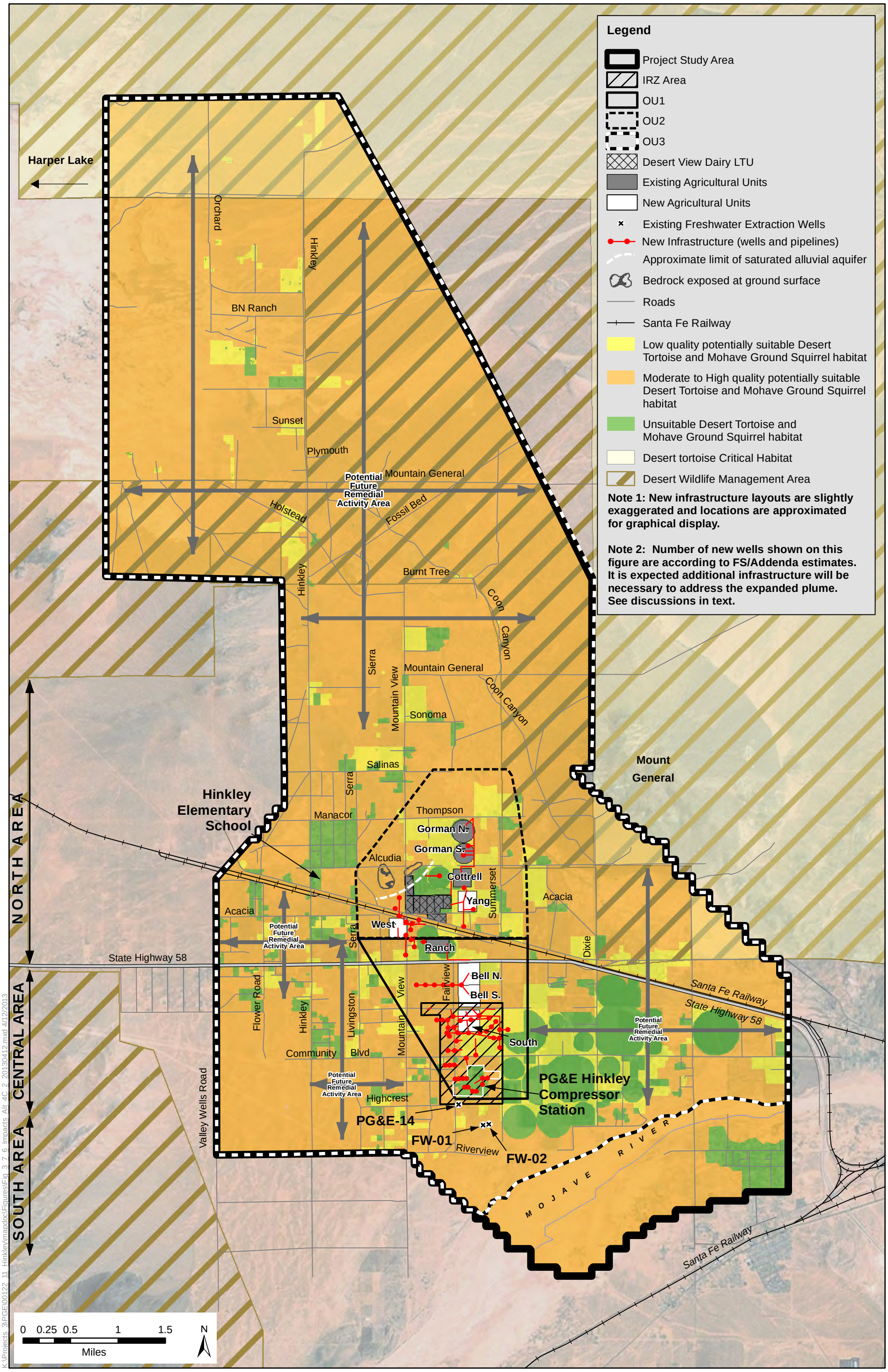
Source: Based on information from PG&E 2011c; USFWS 2013; BLM 2005; Based on field and Desktop (aerial) surveys conducted by ICF in 2011, 2012, 2013

**Figure 3.7-5**
**Alternative 4B**
**Potential Areas of Direct Impacts to Biological Resources**

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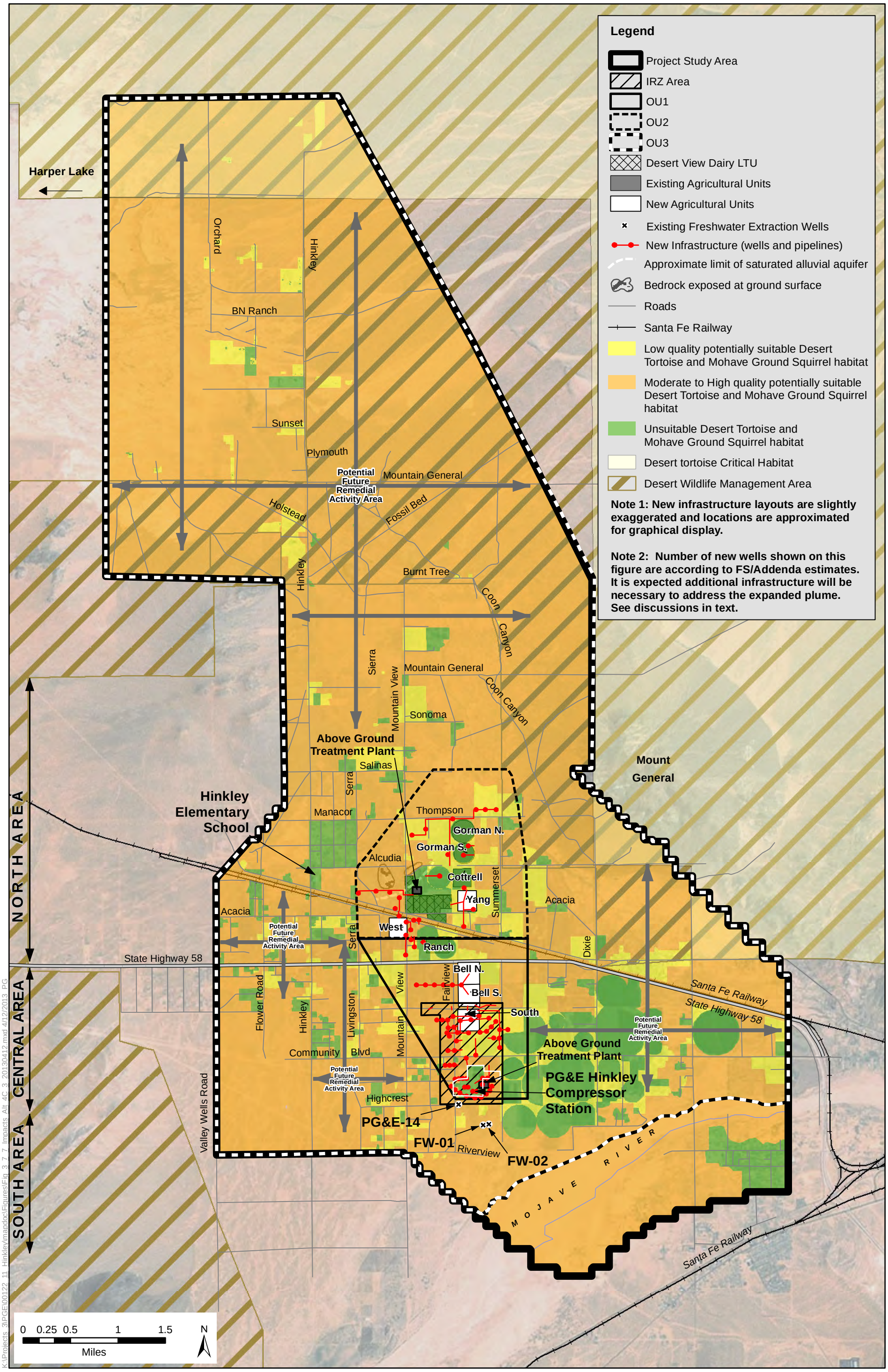
Source: Based on information from PG&E 2011c; USFWS 2013; BLM 2005; Based on field and Desktop (aerial) surveys conducted by ICF in 2011, 2012, 2013

**Figure 3.7-6**
**Alternative 4C-2**
**Potential Areas of Direct Impacts to Biological Resources**

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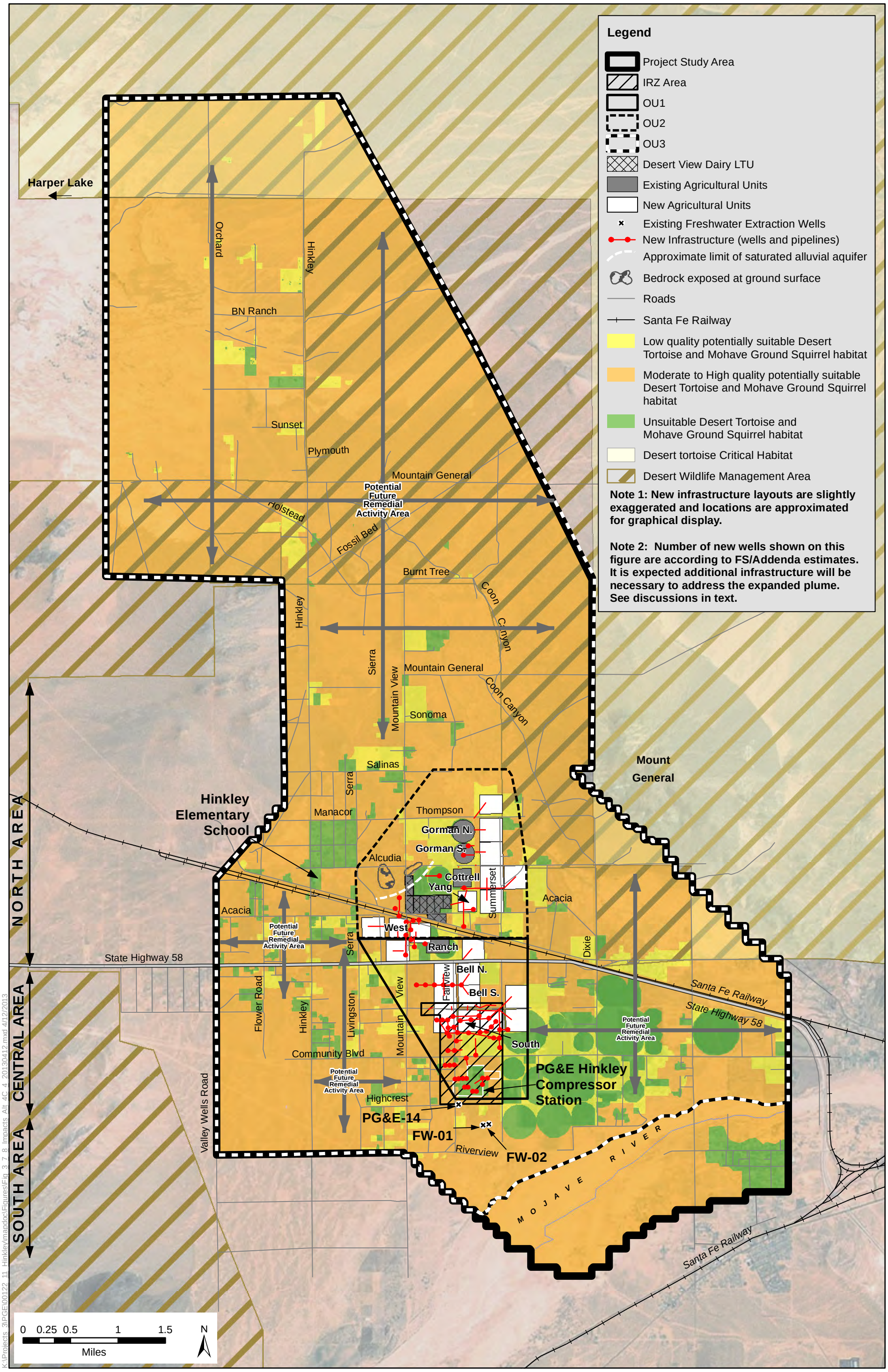
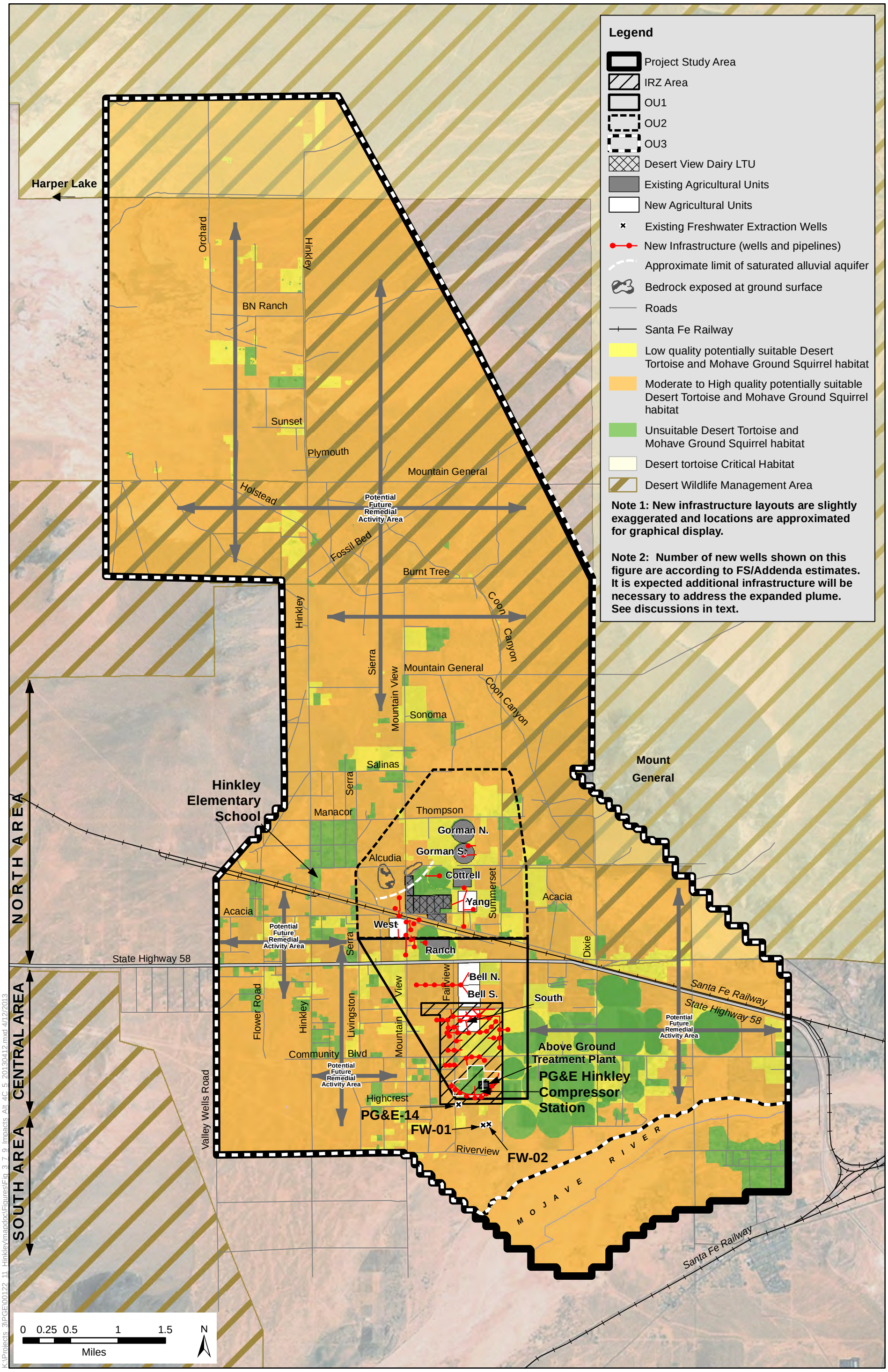
Source: Based on information from PG&E 2011c; USFWS 2013; BLM 2005; Based on field and Desktop (aerial) surveys conducted by ICF in 2011, 2012, 2013

**Figure 3.7-7**
**Alternative 4C-3**
**Potential Areas of Direct Impacts to Biological Resources**




Source: Based on information from PG&E 2011c; USFWS 2013; BLM 2005; Based on field and Desktop (aerial) surveys conducted by ICF in 2011, 2012, 2013

**Figure 3.7-8**
**Alternative 4C-4**
**Potential Areas of Direct Impacts to Biological Resources**

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Source: Based on information from PG&E 2011c; USFWS 2013; BLM 2005; Based on field and Desktop (aerial) surveys conducted by ICF in 2011, 2012, 2013

**Figure 3.7-9**
**Alternative 4C-5**
**Potential Areas of Direct Impacts to Biological Resources**

**Table 3.7-4b. Potential Desert Tortoise and Mohave Ground Squirrel Habitat Impacts, Worst-Case Scaled Scenario (Acres)**

| | Suitable, Low Quality | Suitable, Moderate to High Quality | Total habitat (low, Moderate, High) | Unsuitable |
|---|---|---|---|---|
| No Project Alternative | 3 | 5 | 7 (rounded) | 2 |
| Alternative 4B | 30 | 271 | 301 | 3 |
| Alternative 4C-2 | 51 | 378 | 430 | 5 |
| Alternative 4C-3 | 53 | 392 | 445 | 5 |
| Alternative 4C-4 | 254 | 1,023 | 1,277 | 1 |
| Alternative 4C-5 | 51 | 381 | 432 | 4 |

Note:
For the No Project Alternative, areas of potential impact are known, so this scenario is the same as the proportional case.
For the action alternative, the areas of potential impact were scaled up from footprint acres from the Feasibility Study/Addenda as described in the methodology. Thus, for the action alternatives, these acreages will not match the areas shown in Figures 3.7-5 through 3.7-9 as the figures only show the areas identified based on Feasibility Study/Addenda spatial data. Areas scaled up were assumed to contain moderate to high quality suitable habitat.

**Construction Impacts**

Construction of new wells and all associated infrastructure (i.e., well pads, extraction pumps, transmission pipelines, in-situ treatment equipment such as pumps and dosing equipment, fencing to secure equipment areas), new access roads, above-ground treatment facilities, and new agricultural treatment units would require land clearance, trenching, paving, concrete laying, and crop planting. These activities would also increase presence of construction workers and storage and use of large construction vehicles and equipment that may conflict with the existing open, undisturbed areas and adjacent areas that are inhabited by desert tortoise or which could serve as future suitable habitat for desert tortoise.

The majority of construction impacts would occur during the initial buildout of wells (all alternatives), agricultural land treatment units (all action alternatives), and above-ground treatment facilities (Alternatives 4C-3 and 4C-5 only). As a result, desert tortoise may enter the disturbed areas or become entrapped, leading to short-term and long-term removal or loss of individuals and burrowing areas. Continued construction of these components (in subsequent phases) would also result in the same impacts.

Construction of wells and associated above-ground infrastructure and above-ground treatment facilities has the potential to increase the area where disturbed landscapes and native habitats interface. This interface area is subjected to edge effects[3], which would be unfavorable to desert tortoise occupancy if the edge effect is adjacent to desert tortoise habitat.

Construction could attract predators by providing potential sources of food and water due to trash, and construction watering, as well as perches provided by new structures and perimeter fencing. Increased predators in the project area, especially the common raven, could result in increased

[3] Edge effects are the unfavorable interaction between native and disturbed/developed habitat edges where aspects of the disturbed/developed area spills into the native/natural area.

predation rates on desert tortoise that are occupying areas within and adjacent to direct areas of disturbance.

Construction of new access roads (both paved and unpaved gravel), as well as increased use of existing access roads for equipment hauling and worker access, would contribute to an increase in disturbance and infringement of areas occupied by desert tortoise, interrupt crossing and potentially result in vehicle-collisions with individuals.

Use of construction equipment would create new sources of noise and/or vibration above existing conditions. The sensitivity of desert tortoise to noise is not well documented, but Bowles et al. (1999) showed very little behavioral or physiological effect on tortoises of loud noises that simulated jet fly-overs and sonic booms. In addition, desert tortoise largely reside underground, which would increase sound attenuation. Finally, the project is not expected to produce sound levels that would be above 93 $L_{eq}$ at 50 feet. Thus there would be less than significant impact to desert tortoise from construction noise. It is possible that there could be adverse vibration impacts as a result of equipment and vehicle operations (Section 3.6, *Noise*, discusses noise and vibration impacts of project implementation) since ground vibrations can cause desert tortoise to emerge from their burrows (USFWS 1994). However, the specific vibration threshold that may cause a behavioral response in desert tortoise has not been studied.

Construction of all new remediation facilities also has the potential to result in introduction and colonization of non-native species. Proliferation of invasive plants (particularly non-native grasses) is recognized as a threat to desert tortoise habitat because they have a lower nutritional value when compared to native forbs and other plants, and can negatively change the natural fire regime by increasing fire frequency (due to presence of new vegetation).

Construction-related impacts (other than noise, but including vibration as a potential impact) are considered significant for all alternatives due to the potential for direct and indirect loss of individual desert tortoise and their existing habitats in the project area. However, implementation of the **Mitigation Measures BIO-MM-1a through BIO-MM-1h** would avoid or minimize species loss and habitat disturbance impacts through requirements to follow federal protocols for protection, limiting areas of disturbance, eliminating or reducing construction hazards and opportunities for predator establishment, and construction worker training and construction monitoring. Compensatory mitigation ratios are proposed to mitigate for permanent removal of suitable habitat for this species as described in **Mitigation Measure BIO-MM-1h**. With implementation of mitigation, the potentially significant construction-related impacts to desert tortoise are considered less than significant.

#### Operations and Maintenance

Operations and maintenance activities would be generally similar across all treatment methods. These activities primarily involve the following activities, and all facilities would be accessed from existing or newly constructed access roads.

- Daily system checks, potential trouble shooting and repair (and replacement of components) and general maintenance of all equipment, and infrastructure associated with remediation facilities.
- Periodic well rehabilitation and redevelopment.
- Removal, cleaning, and maintenance of well pumps, valves, pipelines, tanks, and appurtenances.

- Planting, coordinating harvest scheduling and evaluating crop health.
- Collection of operating data of all operating components at all facility sites.
- Measuring, tracking and adjusting of in-situ, agricultural land treatment and ex-situ operational processes (pumps, flow rates, etc.).
- Collection of water quality samples for laboratory analysis.
- Completing in-situ remediation carbon injection.
- Materials deliveries.
- Trash and lab waste pick up for off-site transportation.

Desert tortoises are not expected to be regular occupants of the agricultural treatment units (included in all action alternatives) because they are largely unsuitable for the species. However, there is the possibility that tortoises could on rare occasion move through these areas and become exposed to agricultural-related herbicides, pesticides, and/or rodenticides if they are used.

At present, there is no data on long-term exposure of wildlife to waterborne hexavalent chromium and potential adverse effects. Impact on animals has only been demonstrated in laboratory studies where the exposure has been in the range of 20,000 parts per billion, which is many thousands of times more concentrated than any concentration of chromium which might appear for a short time in any irrigation water used for agricultural treatment. Given the lack of evidence for this impact, it is not identified as a significant impact.

Above-ground treatment facilities (included in Alternatives 4C-3 and 4C-5) would be staffed 24 hours a day at all times, and there would be nighttime lighting of all buildings at these facilities. There could be emergency maintenance activities during nighttime hours requiring introduction of new lighting at the affected facilities. Since the entire project area is interspersed with moderate to high quality desert tortoise habitat, it is possible that there could be direct and indirect disturbance to both individual tortoises and habitat as a result of collision, crushing, and entrapment due to operations and maintenance activities. The frequency of operations and maintenance activity may decrease as certain facilities are brought offline in later years; however, the potential for adverse impacts to desert tortoise would still exist.

Therefore, these impacts are considered potentially significant for all alternatives. **Mitigation Measures BIO-MM-1i through BIO-MM-1j** would minimize potential exposure of tortoises to agricultural treatment-related contaminants and disturbance from nighttime activities. In addition, aspects of **Mitigation Measures BIO-MM-1a through BIO-MM-1f** could continue to be used whenever there are pre-planned operations or maintenance activities thought to possibly affect tortoises or their habitat as determined by a qualified biologist. With implementation of these measures, this impact would be considered less than significant, with the exception of desert tortoise movement.

As explained in Impact BIO-4, the No Project Alternative would result in less than significant impacts on tortoise movement, but all action alternatives would result in perhaps a 2-mile contiguous corridor of active agriculture which may impede east-west movement of desert tortoise across the central part of Hinkley Valley In addition, the new agricultural areas would be contiguous to other areas of existing non-project agriculture along the Mojave River, which would increase the area of potential obstacles to desert tortoise movement. Thus, relative to wildlife movement, all action alternatives are considered to result in a significant impact to the desert tortoise. Feasible mitigation

was considered for this impact (see Impact BIO-4), but no feasible mitigation was identified that would meet most of the project goal objectives and would reduce this impact to a less than significant level. As such, the action alternatives are considered to result in a significant and unavoidable impact related to desert tortoise movement.

## No Project Alternative

The No Project Alternative would involve continued implementation of plume containment and reduction of the Cr[VI] plume concentrations. The primary differences between the No Project Alternative and existing conditions are increased in-situ remediation and associated wells and well infrastructure. The No Project Alternative would not increase agricultural treatment units or agricultural treatment operations above existing conditions.

Although the No Project Alternative would be limited to the existing authorized area of remedial activity, there is potential for adverse impacts to desert tortoise because new occurrences of desert tortoise observances have been recorded in the project area since 2008 (see Figure 3.7-3). The primary area where new wells would be constructed is within OU1 where three SCRIA extraction wells would be constructed as shown in Figure 3.7-4. These areas are currently disturbed and /or urbanized, and there is currently a high degree of wildland interface. There are also both low and moderate to high quality suitable habitat areas interspersed between the urbanized locales. As shown in Table 3.7-4b, there could be a worst-case loss of an estimated 7 acres of suitable habitat under continued remediation activities. Additionally, recent observations confirm that desert tortoise could occur within or adjacent to the areas where new facilities would be constructed. These observations suggest that active, occupied and inactive shelters likely exist within or adjacent to the areas where new facilities may be constructed. Potential to encounter these species during construction, operations and maintenance~~s~~ activities is considered to be likely even though the degree of disturbed land-wildland interface would not change significantly from existing conditions. Implementation of the No Project Alternative is therefore considered to have potentially significant impacts on the desert tortoise and its supporting habitat. These impacts would be the same as described in the overview. With implementation of **Mitigation Measures BIO-MM-1a through BIO-MM-1j,** impacts to desert tortoise as a result of the No Project Alternative would be considered less than significant.

## Alternative 4B

Alternative 4B would expand the area of agricultural land treatment (up to 264 new acres) and other remedial infrastructure in comparison to existing conditions and the No Project Alternative. It is possible that future remediation activities could occur in the northern, southwest and southeast areas of OU3. Areas within OU1 and OU2 where new agricultural extraction wells and the new agricultural unit would be constructed are fairly urbanized and there is a high degree of disturbed land-wildland interface under existing conditions. Areas of OU3 where future remediation activities could occur also contain urbanized or disturbed areas, but also contain the majority of the moderate to high quality suitable desert tortoise habitat in the project area. Table 3.7-4b shows that there could be a worst-case direct loss of up to 301 acres of suitable habitat if Alternative 4B was implemented. Additionally, recent field observations have found occurrences of live tortoises and occupied and inactive shelters within or adjacent to the areas where the new agricultural treatment unit and extraction wells would be constructed, as well as in the northern and southeastern areas within OU3. Figure 3.7-5 shows the known areas of habitat disturbance. Additional disturbance could occur in other areas generally.

Potential to encounter desert tortoise during construction, operations and maintenances activities is considered to be likely in the entire project area~~, even though the proposed expansion of agricultural treatment is limited to the existing disturbed areas of OU1 and OU2~~. Therefore, impacts to this species and its habitat would be the same as described in the overview, which are considered potentially significant. With implementation of **Mitigation Measures BIO-MM-1a through BIO-MM-1j**, impacts to desert tortoise as a result of Alternative 4B would be considered less than significant with the exception of desert tortoise movement, which is considered a significant and unavoidable impact (see Impact BIO-4).

## Alternative 4C-2

Alternative 4C-2 includes additional agricultural land treatment units (up to 393~~2~~ new acres) and other remedial infrastructure than under existing conditions. It involves similar components to Alternative 4B, with the exception of increased number of agricultural units and year-round operation of agricultural land treatment through the addition of winter crops (winter rye or similar crop) to most of the existing and new agricultural units. As such, the area of disturbance and encroachment onto moderate to high quality suitable desert tortoise habitat (both known and future unknown areas of new remedial activity) under this alternative is significantly expanded from existing condition. Figure 3.7-6 shows the known areas of habitat disturbance, but additional disturbance, only indicated in general on the figure, would also occur. As shown in Table 3.7-4b, there could be a worst-case loss of up to 430 acres of suitable habitat. Impacts to desert tortoise under this alternative would be similar to but greater than under Alternative 4B and substantially more than existing conditions; these impacts are considered potentially significant. Implementation of **Mitigation Measures BIO-MM-1a through BIO-MM-1j** would reduce these impacts to a less-than-significant level with the exception of desert tortoise movement, which is considered a significant and unavoidable impact (see Impact BIO-4).

## Alternative 4C-3

Alternative 4C-3 includes all of the same new agricultural treatment units (up to 393~~2~~ acres) and IRZ infrastructure as Alternative 4C-2, but adds ex-situ treatment at two above ground treatment facilities, one located in the Source Area in-situ remediation zone near the Compressor Station and one in OU2 adjacent to the existing Desert View Dairy land treatment unit. The proposed new treatment infrastructure significantly expands the area and intensity of remediation activities compared to existing conditions. Although the new above ground treatment facilities are both located in developed areas, the proximity to adjacent suitable habitat can still result in indirect impacts. Figure 3.7-7 shows the known areas of habitat disturbance, but additional disturbance, only indicated in general on the figure, would also occur. As shown in Table 3.7-4b, there could be a worst-case loss of up to 445 acres of suitable habitat. Impacts to desert tortoise under this alternative would be the similar to Alternative 4C-2 and are considered potentially significant. Implementation of **Mitigation Measures BIO-MM-1a through BIO-MM-1j** would reduce these impacts to a less-than-significant level with the exception of desert tortoise movement, which is considered a significant and unavoidable impact (see Impact BIO-4).

## Alternative 4C-4

Alternative 4C-4 would significantly increase the area of agricultural treatment (by up to 1,212 acres) and would have other remedial infrastructure compared to existing conditions. This alternative would have the greatest amount of habitat impacts to desert tortoise within the OU1 and

OU2 areas of known remedial activities and would also have the greatest likely impacts within areas of OU3 due to expanded agricultural treatment necessary to address the expanded plume. Figure 3.7-8 shows the known areas of habitat disturbance, but additional disturbance, only indicated in general on the figure, would also occur. As shown in Table 3.7-4b, there could be a worst-case loss of up to 1,277 acres of suitable habitat for desert tortoise. Therefore, impacts to this species under this alternative are considered potentially significant and implementation of **Mitigation Measures BIO-MM-1a through BIO-MM-1j** would reduce these impacts to a less-than-significant level for all impacts to this species other than wildlife movement with the exception of desert tortoise movement, which is considered a significant and unavoidable impact (see Impact BIO-4).

## Alternative 4C-5

Alternative 4C-5 has all of the same agricultural land treatment (up to 393~~2~~ new acres) as Alternative 4C-2 and 4C-3, but adds ex-situ treatment at one above-ground treatment facility located in the Source Area in-situ remediation zone. It would have similar impacts to Alternatives 4C-2 and 4C-3 in comparison to existing conditions. Figure 3.7-9 shows the known areas of habitat disturbance, but additional disturbance, only indicated in general on the figure, would also occur. As shown in Table 3.7-4b, there could be a worst-case loss of up to 436 acres of suitable habitat for desert tortoise. Therefore, impacts to this species under this alternative are considered potentially significant and implementation of **Mitigation Measures BIO-MM-1a through BIO-MM-1j** would reduce these impacts to a less-than-significant level with the exception of desert tortoise movement, which is considered a significant and unavoidable impact (see Impact BIO-4).

**Impact BIO-1b: Disturbance, Mortality, and Loss of Habitat for Mohave Ground Squirrel (Less than Significant with Mitigation, All Alternatives)**

## Overview of Impact

Overall construction and operations and maintenance impacts of all alternatives on Mohave ground squirrel would be similar to those of the desert tortoise as proposed remediation activities under all alternatives have the potential to infringe on low and moderate to high quality Mohave ground squirrel habitat throughout the entire project area (as shown in Figure 3.7-2 and Table 3.7-4). Mohave ground squirrels are known to inhabit areas near agricultural fields to feed on crops such as alfalfa. Their inhabitance in these areas poses a significant adverse risk of loss of individuals and habitat since they construct and use burrows for shelter, which could be removed during land clearing activities for crop planting, mowing and harvesting. Establishment of new agricultural treatment units may also attract Mohave ground squirrel to a new food source thereby further increasing the risk of adverse impacts from collision, crushing, and entrapment due to human activities from project implementation. Predation risks are not as high as they are for the desert tortoise since Mohave ground squirrels spend most of the year dormant and underground.

As with desert tortoise, both construction-related and operations and maintenance activities may contribute to potentially significant impacts that could result in the loss of Mohave ground squirrel individuals and removal of Mohave ground squirrel habitat. Implementation of **Mitigation Measures BIO-MM-1b through BIO-MM-1k** would reduce these impacts to a less-than-significant level.

## No Project Alternative

As shown in Table 3.7-4b, there could be an estimated loss of up to 7 acres of suitable habitat for Mohave ground squirrel (these areas are the same as for the desert tortoise as both species share the same type of suitable habitat requirements). Potential to encounter these species during construction, operations and maintenances activities is considered to be likely even though the degree of wildland interface would not change significantly from existing conditions. Implementation of the No Project Alternative is therefore considered to have potentially significant impacts on the Mohave ground squirrel and its supporting habitat. These impacts would be the same as described in the overview. With implementation of **Mitigation Measures BIO-MM-1b through BIO-MM-1k,** impacts to Mohave ground squirrel as a result of the No Project Alternative would be considered less than significant.

## Alternative 4B

Alternative 4B would expand the area of agricultural land treatment and associated agricultural extraction wells between SR 58 and Thompson Road (within OU1 and OU2). It is possible that future remediation activities could occur in the northern, southwest and southeast areas of OU3. This alternative would also increase the amount of in-situ remediation and associated infrastructure. Table 3.7-4b shows that there could be a worst-case direct loss of up to 301 acres of suitable habitat for Mohave ground squirrel under this alternative. Figure 3.7-5 shows the known areas of habitat disturbance, but additional disturbance, only indicated in general on the figure, would also occur. Because the Mohave ground squirrel is known to use alfalfa as a food source, the expansion of agricultural units within the known and future remedial activity areas could make the squirrel more susceptible to potentially significant impacts from increased agricultural treatment activities in comparison to existing conditions. Potential to encounter the species during construction, operations and maintenances activities is considered to be likely in the entire project area~~, even though the known expansion of agricultural treatment is limited to the existing disturbed areas of OU1 and OU2~~. Therefore, impacts to this species and its habitat would be the same as described in the overview and these impacts are considered potentially significant. With implementation of **Mitigation Measures BIO-MM-1b through BIO-MM-1k,** impacts to Mohave ground squirrel as a result of Alternative 4B would be considered less than significant

## Alternative 4C-2

Alternative 4C-2 includes additional agricultural land treatment, and additional associated extraction and injection wells compared to existing conditions and adds year-round operation of agricultural land treatment, through the addition of winter crops (winter rye or similar crop) to most of the existing and new agricultural units. This alternative would also increase the amount of in-situ remediation and associated infrastructure. As such, the area of disturbance and encroachment onto moderate to high quality suitable Mohave ground squirrel habitat (both known and future unknown areas of new remedial activity) under this alternative is significantly expanded from existing conditions. Figure 3.7-6 shows the known areas of habitat disturbance, but additional disturbance, only indicated in general on the figure, would also occur. As shown in Table 3.7-4b, there could be a worst-case loss of up to 430 acres of suitable habitat. Impacts to Mohave ground squirrel under this alternative would be similar in character as Alternative 4B but at a greater level and significantly more than existing conditions; these impacts are considered potentially significant. Implementation of **Mitigation Measures BIO-MM-1b through BIO-MM-1k** would reduce these impacts to a less-than-significant level.

## Alternative 4C-3

Alternative 4C-3 includes all of the same new agricultural treatment components and IRZ wells as Alternative 4C-2, but adds ex-situ treatment at two above ground treatment facilities, one located in the Source Area IRZ near the Compressor Station and one in OU2 adjacent to the existing Desert View Dairy land treatment unit. The new facilities significantly expand the area and intensity of remediation activities compared to existing conditions. The area of disturbance and encroachment onto moderate to high quality suitable habitat over existing conditions would be similar to that under Alternative 4C-2. Figure 3.7-7 shows the known areas of habitat disturbance, but additional disturbance, only indicated in general on the figure, would also occur. As shown in Table 3.7-5b, there could be a worst-case loss of up to 445 acres of suitable habitat. Impacts to Mohave ground squirrel under this alternative would be similar to Alternative 4C-2 and is therefore considered potentially significant. Implementation of **Mitigation Measures BIO-MM-1b through BIO-MM-1k** would reduce these impacts to a less-than-significant level.

## Alternative 4C-4

Alternative 4C-4 significantly increases the number of agricultural treatment areas compared to existing conditions. This alternative would also increase the amount of in-situ remediation and associated infrastructure. Figure 3.7-8 shows the known areas of habitat disturbance, but additional disturbance, only indicated in general on the figure, would also occur. As shown in Table 3.7-4b, this alternative would have the greatest potential amount of impacts to Mohave ground squirrel (worst-case direct loss of up to 1,277 acres of suitable habitat). It would have similar impacts as all other action alternatives within the future remedial activity areas in comparison to existing conditions. Therefore, impacts to this species under this alternative are considered potentially significant and implementation of **Mitigation Measures BIO-MM-1b through BIO-MM-1k** would reduce these impacts to a less-than-significant level.

## Alternative 4C-5

Alternative 4C-5 has all of the same agricultural land treatment components as Alternative 4C-2 and adds ex-situ treatment at one above ground treatment facility located in the Source Area in-situ remediation zone. This alternative would also increase the amount of in-situ remediation and associated infrastructure. In comparison to existing conditions, similar impacts to Mohave ground squirrel would occur under this alternative as under Alternatives 4C-2. Figure 3.7-9 shows the known areas of habitat disturbance, but additional disturbance, only indicated in general on the figure, would also occur. As shown in Table 3.7-4b, there could be a worst-case loss of up to 432 acres of suitable habitat. Therefore, impacts to this species under this alternative are considered potentially significant and implementation of **Mitigation Measures BIO-MM-1b through BIO-MM-1k** would reduce these impacts to a less-than-significant level.

### Impact BIO-1c: Disturbance, Mortality, and Loss of Habitat for Burrowing Owl and American Badger, and Mortality of Desert Kit Fox (Less than Significant with Mitigation, All Alternatives)

Overall construction and operations and maintenance impacts of all alternatives on both the burrowing owl and American badger would be similar to those of the desert tortoise as proposed remediation activities under all alternatives have the potential to infringe on low and moderate to high quality habitat of these species throughout the entire project area (as show in Figure 3.7-2).

As described in the Environmental Setting, burrowing owls are known to inhabit a wide variety of disturbed and natural habitat areas including active and non-active agricultural lands. They have moderate to high potential to occur within the project area and have been recorded in recent field observations within the central agricultural treatment areas as shown in Figure 3.7-3. Burrowing owls have the potential to use the project area for foraging, nesting and to use existing burrows excavated by ground squirrels, badgers and desert tortoise. Burrowing owls may also nest within or immediately adjacent to the agricultural areas. Agricultural units may attract and support populations of invertebrates and small mammals, which in turn may create high quality burrowing owl foraging habitat that could be a long-term beneficial impact. However, agriculture treatment-related activities such as land clearing for crop planting, routine mowing, and harvesting may result in potential direct and indirect permanent loss of burrowing owls and their supporting habitat. If burrowing owls utilize the agricultural treatment units for a portion of their life cycle, they may become exposed to ~~waterborne hexavalent chromium, as well as exposure to~~ herbicide/rodenticide and pesticide applications.

Similar to the desert tortoise and Mohave ground squirrel, the sensitivity of burrowing owl to noise (and vibration) is not well documented, but the male (who is largely above-ground during the nesting cycle) could exhibit negative reactions to increases in noise and vibration levels above existing conditions that could cause nest abandonment and death of young or loss of reproductive potential at active nests. New facilities could also increases predation risks to the burrowing owl similar to the Desert tortoise and Mohave ground squirrel. Burrowing owls are also known to be active during both the daytime and nighttime and therefore may be disrupted in the event they are affected by night lighting of facilities or emergency operations and maintenance activities thereby further increasing the risk of adverse impacts from collision, crushing, and entrapment due to human activities from project implementation.

The American badger also was determined to have moderate to high potential to occur within the project area for both foraging and denning. Impacts to <u>the</u> American badger would be similar to those of the burrowing owl; however, in regards to noise impacts, the American badger largely resides underground, which would increase sound attenuation and limit their exposure to noise-related disturbances. Ground-borne vibration may still cause adverse impacts to the badger. Overall, noise and vibration impacts are considered potentially adverse if they result in abandonment of nesting sites. American badgers have few natural predators and would not be subject to predation and harassment by a species such as the common raven. American badger is not expected to be a regular occupant of the agricultural treatment units because they are largely unsuitable habitat. Additionally, there is a high potential for desert kit fox to occur within the project area, and the loss of individuals would be considered a potentially significant impact because it would violate a CDFG mammal hunting regulation.

With the No Project Alternative, impacts to these species would still be considered higher than under existing conditions due to the increases in human related activities from new remediation facilities. Under Alternative 4B there would be more significant impacts than the No Project Alternative when compared to existing conditions due to the expanded agricultural treatment areas. Impacts under all other action alternatives would be more than Alternative 4B in comparison to existing conditions due to larger areas of agricultural treatment and other remedial activities. Alternative 4C-4 has the potential to have the greatest impacts to these species as it would implement the largest acreage of agricultural units within the central project area.

For American badger and desert kit fox, both construction-related and operations and maintenance activities would contribute to potentially significant impacts that could result in the loss of individuals. Habitat impacts to the American badger and desert kit fox are not considered significant due to the abundance of habitat for these species in the project vicinity and throughout the Mojave Desert. Implementation of **Mitigation Measures BIO-MM-1b through BIO-MM-1e, BIO-MM-1i through BIO-MM-1j, and Mitigation Measure BIO-MM-1m** would reduce impacts to these two species to a less than significant level by reducing project disturbance areas, environmental education, minimizing construction hazards, predator, integrated pest management, light management, and surveys and avoidance of action badger and desert kit fox dens.

For the burrowing owl, both construction-related and operations and maintenance activities would contribute to potentially significant impacts that could result in the loss of individuals and removal of moderate to high quality habitat. Implementation of **Mitigation Measures BIO-MM-1b through BIO-MM-1j** would reduce construction-related and operations and maintenance impacts to burrowing owl to a less-than-significant level. **Mitigation Measure BIO-MM-1l** would require pre-construction surveys in coordination with regulatory agencies to identify presence or absence of burrowing owl within the project area to further avoid or minimize impacts to burrowing owl.

**Impact BIO-1d: Disturbance, Mortality, and Loss of Habitat to Loggerhead Shrike and Northern Harrier (Less than Significant, No Project Alternative; Less than Significant with Mitigation, All Action Alternatives)**

The loggerhead shrike typically inhabits shrublands such as those that are present through the project area. They also use fences and power lines as perching areas; the majority of the project area is high quality foraging and nesting habitat for the loggerhead shrike. This species was recently observed in the northwestern area of the project area (near Hinkley Road and Sunset Road/ Plymouth Road) (see Figure 3.7-3), and was identified as using the areas to the east for foraging.

The northern harrier is known to breed and forage in a variety of habitats, including agricultural areas, such as alfalfa fields. Northern harrier was observed in the area adjacent to the upper limit of OU2 at Salinas and Mountain View Roads (see Figure 3-7.3). Northern harrier has also been known historically to breed northwest of project area at Harper Lake, and also may occasionally breed in west the Mojave area, but no breeding activity has been recorded since the mid-1990s. Recent observations of northern harrier have occurred in the northwest portion of the project area. Subsequently, there is potential for these species to exist within the project area, though the quality of habitat present is considered low.

The No Project Alternative does not include expansion of agricultural activities and only includes limited ground disturbance for new remedial facilities so potential for adverse impacts to these species is considered to be less than significant. Both species have the potential to occur within future potential remedial activity areas; therefore, there would be an increased impact to these species if the No Project Alternative was implemented in comparison to existing conditions, but given the limited area of disturbance, it would still be a less than significant impact.

Overall construction and operations and maintenance impacts of the other alternatives on both the loggerhead shrike and northern harrier would be similar to those for burrowing owl and badger. Proposed remediation activities have the potential to remove habitat where these species currently occur or may occur in the project area (as show in Figure 3.7-2). One potential impact to loggerhead shrike, as well as other breeding birds, would be an increased threat to successful breeding from

establishment of new agricultural treatment units that may attract the brown-headed cowbirds. The brown-headed cowbird is known to occupy similar agricultural areas and increased occurrences of the brown-headed cowbird can lead to a reduction in the ability for some bird species to produce young. Cowbird parasitism is known to decrease productivity of bird species in general, and expansion of agricultural treatment units under the action alternatives has the potential to increase significant adverse impacts to the existing bird species (Kus 1999). Compared to existing conditions and the No Project Alternative, this adverse effect would be greater with Alternatives 4C-2, 4C-3, and 4C-5 and the greatest with Alternative 4C-4 because it has substantially more new agricultural treatment. Implementation of **Mitigation Measure BIO-MM-1i** requires monitoring and management of cowbird population, and would reduce the impacts due to cowbirds to less than significant.

For loggerhead shrike and northern harriers, both construction-related and operations and maintenance activities would contribute to potentially significant impacts that could result in the loss of individuals and removal of suitable foraging and nesting habitat for all action alternatives. Implementation of **Mitigation Measures BIO-MM-1b through BIO-MM-1f, and BIO-MM-1i** minimize overall impacts from project implementation. **Mitigation Measure BIO-MM-1n** would further avoid or reduce these impacts to a less-than-significant level by ~~limiting construction to occur outside breeding season and establish exclusionary areas for project-related disturbance~~requiring preconstruction surveys and imposing buffer requirements when needed.

**Impact BIO-1e: Potential Loss of Habitat to Mojave River Vole (Less than Significant All Alternatives)**

The Mojave River vole is typically found in moist habitats such as wetland and marsh habitats associated with ponds and irrigated pastures as well as within the Mojave River. The Mojave River vole has been known to inhabit the Mojave River during annual flooding events. This species has the potential to inhabit alfalfa fields near the Mojave River, but suitable habitat is not present within observed portions of the Mojave River in the project. These areas are considered low to moderately-quality potential for supporting the Mojave River vole.

The active remedial agricultural treatment areas are currently located well north of the Mojave River, and it is assumed that current agricultural treatment activities (such as mowing and use of herbicides/rodenticides) would not result in significant adverse impacts to this species due to the low potential for their presence in existing agricultural treatment areas.

The No Project Alternative would not include expansion of agricultural treatment units; therefore, impacts to this species are not considered significant and adverse compared to existing conditions for this alternative.

Implementation of all action alternatives (4B 4C-2, 4C-3, 4C-4, 4C-5) could result in expansion of agricultural treatment units including within proximity to the Mojave River. The expansion of new agricultural treatment units may attract and support populations of Mojave River vole due to the introduction of suitable moist habitats of the agricultural units and resulting irrigation fields. Planting of alfalfa crops within new agricultural treatment units may also increase the potential for these species to inhabit these areas. Although it is possible that individuals of this species might be affected by agricultural equipment in new agricultural treatment areas, given that the project would, if anything, increase habitat for this species during project activities, the project would be expected

to support increases in populations of this species, if anything and thus the project is not expected to result in a significant impact to this species.

**Impact BIO-1f: Mortality and Loss of Habitat for Mojave Fringe-Toed Lizard (Less than Significant, All Alternatives)**

As described in Section 3.7.4.1 above, two sensitive natural communities listed by CDFG are located in the project area: the California joint fir scrub and desert dunes (see Figure 3.7.1). The California joint fur scrub is located in the southern-central portion of the project area, generally between Highcrest Road and the Mojave River as it passes through the project area. Desert dunes habitat is located in the south part of the project area (below the Mojave River) and in the northeastern part of the project area (see Figure 3.7.1). The Mojave fringe-toed lizard has the potential to inhabit these California joint fir scrub and desert dunes plant communities of the project area (California Natural Diversity Database 2013~~1~~).

Two existing freshwater extraction wells (FW-01 and FW-02) that are currently used to implement hydraulic control of the plume occur within the California joint fir scrub habitat area, which is suitable for Mojave fringe-toed lizard. There are currently no other existing remediation activities occurring within this area.

However, given that this location is upgradient of the chromium plume and where groundwater is most readily recharged from the Mojave River, it is possible that new wells and pipelines may be proposed in this area to provide alternative water supplies to domestic and agricultural wells that are currently affected by the plume or may be affected by future remedial actions (see discussion in Section 3.1, *Water Resources and Water Quality*). As a result, remedial actions and mitigation may affect a small portion of California joint fir scrub habitat area and the Mojave fringe-toed lizard, if present. Desert dunes habitat and dune land soils suitable for the Mojave fringe-toed lizard in the northwestern portion of the project area are within OU3 and could be subject to remedial activities as remediation is scaled up to address the expanded plume. These~~is~~ impacts will be small in area and would have the potential to affect ~~only very~~ few Mojave fringe-toed lizard individuals. Therefore, this impact is considered likely to be less than significant but **Mitigation Measures BIO-MM-1b through BIO-MM-1g, BIO-MM-1p, and BIO-MM-2** are recommended to ensure that these impacts remain at a less than significant level.

~~This species also has known potential to occur in the desert dunes habitat (south of the Mojave River) (California Natural Diversity Database 2011). However, there are currently no remediation activities occurring within the desert dunes habitat and none are planned in any of the alternatives.~~

**Impact BIO-1g: Loss of Other Special-Status Birds (Less than Significant with Mitigation, All Alternatives)**

Several raptors have the potential to occur throughout the project area due to the presence of high quality foraging and potential nesting habitats for these species. Under all alternatives, construction and operations and maintenance of new remediation facilities would be expanded over existing conditions and may result in increased habitat modification and resulting impacts to the ability of raptor species to use the project area. Implementation of **Mitigation Measure BIO-MM-1i** would minimize overall impacts from project implementation. **Mitigation Measure BIO-MM-1n** would further avoid or reduce these impacts to a less-than-significant level by limiting construction to occur outside breeding season and establish exclusionary areas for project-related disturbance.

**Impact BIO-1h: Loss of Individual Plants or Disturbance to Special-Status Plants (Less than Significant with Mitigation, All Alternatives)**

The project area potentially contains one federally-threatened plant, the Lane Mountain milk-vetch, and eight special-status plants listed under the California Native Plant Protection Act. These plants primarily have the potential to occur within the allscale scrub (primarily allscale scrub – sparse playa) and creosote bush scrub communities. As shown in Figure 3.7-1, allscale scrub playa areas occur in the eastern and northern portions of the project area. This community is interspersed among the other allscale scrub desert scrub communities (including disturbed scrub)~~,~~ ~~which~~ allscale scrub (all types) encompass approximately 60~~59~~ percent of the project area. Creosote bush scrub areas occur in the northeastern and northwestern areas and are in scattered areas in the southeastern locations of the project area (see Figure 3.7-1). Creosote bush scrub encompasses approximately 17~~11~~ percent of the project area. Collectively these two vegetation communities encompass 77~~70~~ percent of the entire project area and all of the future potential remedial activity areas in their entirety.

Existing remediation activities primarily occur outside of these habitats. One of the existing freshwater extraction wells (PG&E-14) is located within approximately 0.25 to 0.5-mile of a small portion of the southern interspersed creosote bush scrub on the south side of Highcrest Road. Additionally, there are monitoring wells throughout the project area, which may be located within or directly adjacent to both allscale sparse playa and creosote bush scrub. The existing agricultural treatment areas are concentrated in the central portions of the overall project area. The two Gorman agricultural treatment units are located south of and directly adjacent to Thompson Road; a portion of the allscale sparse playa community is located directly north of these units on the north side of Thompson Road (approximately within 0.25-mile of the Gorman agricultural units) (see Figure 3.7-1).

Construction of new wells, all associated infrastructure, and new access roads (all alternatives); new agricultural treatment units (all action alternatives); and above-ground treatment facilities (Alternatives 4C-3 and 4C-5) would require land clearance, trenching, paving, concrete laying, and crop planting. These activities would also increase presence of construction workers and storage and use of large construction vehicles and equipment. Construction of wells and associated above-ground infrastructure and construction of above-ground treatment facilities have the potential to increase the area where urbanized landscapes and native plant habitats interface, especially in the future remedial activity areas (where new wells could be located but not new above-ground treatment facilities) because that is where the majority of the moderate to higher quality special-status plant species habitat is present. Construction of all new remediation facilities has the potential for introduction/colonization of non-native plant species (particularly non-native grasses) which may infringe on and reduce suitable habitat for special-status plant species to occur. The majority of construction impacts would occur during the initial buildout of wells, agricultural land treatment units and above-ground treatment facilities. Continued construction of these components (in subsequent phases) would also result in the same impacts.

These construction-related impacts have the potential to cause direct and indirect permanent loss of individual special-status plants in the project area. Implementation of **Mitigation Measure BIO-MM-1g and BIO-MM-1o** would minimize impacts to special-status plant species and their supporting habitat to a less-than-significant level.

For all alternatives, operations and maintenance activities are not expected to have adverse effects to special-status plants or their habitat since these activities would primarily occur within areas that have already been disturbed during construction of new remediation facilities. However, Alternatives 4C-3 and 4C-5 include new above-ground facilities, there may be increased potential to introduce non-native plants due to increased presence of vehicles (for materials deliveries, trash collection) that may carry remnants of non-native plants on their tires. Although these impacts are not considered significant and adverse, implementation of **Mitigation Measure BIO-MM-1g** would further minimize any operations and maintenance impacts to special-status plants within the project area.

### 3.7.6.2 Riparian Habitat or Sensitive Natural Communities

**Impact BIO-2: Reduction or Loss of Function of Riparian Habitat or Sensitive Natural Communities (Less than Significant with Mitigation, All Alternatives)**

No riparian habitat was observed within the project area, and there is no potential for such habitat to be adversely affected by project implementation.

As described in Section 3.7.4.1 above, two sensitive natural communities listed by CDFG are located in the project area including the California joint fir scrub and desert dunes (see Figure 3.7.1). The California joint fur scrub is located in the southern ~~central~~ portion of the project area, generally between Highcrest Road and the Mojave River as it passes through the project area. Desert dunes habitat is located in the south part of the project area (below the Mojave River), as well as in the northwestern part of the project area (see Figure 3.7.1). ~~The Mojave River wash may also be considered a sensitive natural community and is located in the southern section of the project area.~~

Two existing freshwater extraction wells (FW-01 and FW-02) that are currently used to implement hydraulic control of the plume occur within the California joint fir scrub habitat area. There are no existing remediation activities occurring within the ~~Mojave River wash or~~ desert dunes habitat areas to the south of the Mojave River. As noted above, there is no proposed remedial activity in the desert ~~Mojave River~~ wash areas.

New remedial activities and associated infrastructure under all alternatives would be focused away from these sensitive natural communities. However, given that the California joint fur scrub is upgradient of the chromium plume and where groundwater is most readily recharged from the Mojave River, it is possible that new wells and pipeline may be proposed in this area to provide alternative water supplies to domestic and agricultural wells that are currently affected by the plume or may be affected by future remedial actions (see discussion in Section 3.1, *Water Resources and Water Quality*). As a result, remedial actions and mitigation may affect a small portion of California joint fir scrub habitat area. If these new infrastructure are constructed, there may be potential for significant adverse impacts due to construction-related disturbance and permanent loss of California joint fir scrub. Implementation of **Mitigation Measure BIO-MM-2** would minimize these impacts to a less-than-significant level.

Desert dunes habitat and dune land soils are mapped in the northwestern portion of the project area within OU3 and could be subject to remedial activities. As a result, remedial actions and mitigation may affect a small portion of desert dunes habitat and dune land soils. If new infrastructure is constructed, there may be potential for significant adverse impacts due to construction-related

disturbance and permanent loss of desert dunes habitat and dune land soils. Implementation of **Mitigation Measure BIO-MM-2** would minimize these impacts to a less-than-significant level.

### 3.7.6.3 Jurisdictional Waters

**Impact BIO-3: Loss or Disturbance of Federal and/or State Jurisdictional Waters (including wetlands) (Less than Significant with Mitigation, All Alternatives)**

Project impacts related to surface water quality contamination are discussed in Section 3.1*, Water Resources and Water Quality.* This analysis focuses on impacts to drainages in the context of habitat impacts.

A formal jurisdictional wetland delineation was not conducted for the project area, and no federally protected wetlands were observed during the field assessment. However tributary washes in the project area that drain to the Mojave River have the potential to be federally regulated waters of the United States. The majority of the drainages in the project area (which drain north and west to Harper Lake) are considered state waters that are subject to state jurisdiction; in addition, the Harper Lake playa potential jurisdictional boundary could overlap the northwestern portion of the project area (as described in Section 3.7.4.9). Harper Lake supports habitat for various waterfowl species as discussed in Impact BIO-1g.

Under all alternatives, construction activities could result in erosion and sedimentation into downgradient surface drainages. It is also possible that new pipelines or new access roads may need to cross desert washes and construction could affect these washes. Operations and maintenance activities could also result in erosion and downgradient sedimentation. Since drainages in the project area are either federally- or state-regulated waters, project related erosion and sedimentation could have the potential to result in adverse effects to jurisdictional waters and any wildlife species that may temporarily use the drainages when they flow. The level of project activity under all alternatives would be increased in comparison to existing conditions, and therefore this impact is considered potentially significant. The extreme northwestern edge of the project study area appears to include part of the Harper Lake playa. Depending on their specific character, playa surfaces can be easily disturbed. Thus, if remedial activities were to be proposed in areas where they would encroach on the playa, there could be permanent changes to the drainage or playa surface.

In addition to direct disturbance, one other potential impact would be if the remedial activities were to lower groundwater levels in areas of shallow water tables if shallow water tables are supporting wetlands or waters. As described above, the water tables in both Hinkley Valley and Harper Valley dropped substantially in response to historic agricultural pumping, and the water tables are no longer in contact with surface features. As such, potential changes in groundwater levels are not expected to affect waters or wetlands, including the wetlands associated with Harper Lake (located on the southern, western, and northern edge far outside the project study area. Further, the project would not affect any of the artificial sources of water (agricultural runoff and a BLM well[4]) supporting the Harper Lake wetlands, which are located outside of the project study area.

As described in Section 3.1, *Water Resources and Water Quality*, PG&E is required to prepare a Stormwater Pollution Prevention Plan (SWPPP) which will minimize potential erosion and

[4] The Abengoa Solar Project would affect these water sources but adopted mitigation requires the project to provide a well source of water to continue artificial maintenance of the potentially affected wetlands (CPUC 2010).

sedimentation. In addition, i~~I~~mplementation of **Mitigation Measure BIO-MM-3** would ensure this impact would remain less than significant because it requires avoidance of ground disturbing activities within drainages and jurisdictional areas wherever feasible, conducting delineations if any drainages are expected to be affected, and implementation of compensatory mitigation in accordance with federal and state requirements if deemed necessary. In addition, Mitigation Measure BIO-MM-3 requires PG&E to avoid the Harper Lake playa to the maximum extent feasible, unless the remediation cannot be performed without encroachment on the playa, in which case compensatory mitigation at a minimum 3:1 ratio will be required.

### 3.7.6.4 Wildlife Movement

**Impact BIO-4: Conflicts with Wildlife Movement (Less than Significant, No Project Alternative; Potentially Significant [desert tortoise only], All Action Alternatives)**

The primary wildlife species that use the project area as a movement corridor are the desert tortoise and Mohave ground squirrel.

The Mohave ground squirrel can have large home ranges (16.6 acres) and long-distance movements (up to 20,000 feet has been recorded), as described under Impact BIO-1b and shown in Figure 3.7-2. It is assumed that Mohave ground squirrel could potentially use any suitable habitat areas; therefore, they are also considered to be unrestricted from movement within the project area under existing conditions. The Mohave ground squirrel, as well as the Mojave River vole, may utilize agricultural areas, but new remediation activities including the agricultural treatment included in all action alternatives are not expected to have a high potential for restricting their movement.

Potential impacts to movement of avian species, such as burrowing owls and northern harrier, are not expected. American badger is likely capable of crossing through agricultural units and no reduction in movement for this species is expected. Mojave fringe-toed lizard's movement potential will not be reduced as the areas inhabited by these species are largely outside of where new agricultural units would occur. For these species, implementation of all project alternatives is not expected to result in significant adverse impacts from introduction of new barriers to movement in comparison to existing conditions.

There is potential for moderate to highly suitable habitat for the desert tortoise throughout the project area, which is interspersed with low quality and urban/developed (or unsuitable) habitats, as discussed under Impact BIO-1a and shown in Figure 3.7-2. Desert tortoise movement occurs in a diffused pattern across the landscape; and where open, expansive areas are maintained, the project would not be expected to constrain desert tortoise movement overall. Construction of new wells and in-situ treatment facilities (included in all alternatives) is not expected to result in large areas of disturbance and would be dispersed across the landscape. New pipelines would be placed in trenches and backfilled such that there would be no above ground infrastructure present that could disrupt movement after construction. New above-ground treatment facilities (Alternatives 4C-3 and 4C-5) would require construction of new buildings, paved roads, and other paved/disturbed areas that could potentially result in permanent changes to open habitat areas that could alter the overall pattern of movement for desert tortoise. However, these new facilities would cover only limited areas of the overall project area with suitable areas for movement surrounding the limited areas of above-ground infrastructure. New roadways would be relatively limited in width and would not incur large amounts of traffic. Although new rural roads would create some obstacle compared to

existing conditions, it is expected that tortoise would cross new rural roads as they cross existing rural roads in the project area.

The largest potential changes to desert tortoise movement from remedial activities would be due to new agricultural units, which may potentially require the loss of existing suitable habitats. It is expected that desert tortoise would not likely cross through new agricultural units, which are typically unattractive for tortoise, and instead would move around the areas. East-west movement in this area is partially hindered at present by the Desert View Dairy and existing agricultural treatment units, but there are areas of suitable habitat for east-west movement north (north of Thompson Road) and south of the existing agricultural treatment units (south of SR 58).

The No Project Alternative would not include new agricultural treatment units and would only have new disturbances for new wells and in-situ remediation facilities which would not create contiguous areas of unsuitable habitat (as shown on Figure 3.7-4). Thus, the No Project Alternative would have a less than significant impact on desert tortoise movement.

As shown in Figure 3.7-5 through 3.7-8, the known future areas of agricultural treatment are centered between Mulinax Road and Serra Road, south of Salinas Road. With the existing agricultural areas east of the PG&E Compressor Station and proposed expansion of agricultural treatment (especially with Alternative 4C-4 as shown in Figure 3.7-8), there could be a contiguous area of agriculture of several miles in length with the remedial alternatives. In addition, there would be additional agricultural units in locations yet to be determined to address the expanded plume, but would likely be in the center of Hinkley Valley, perhaps north and south of those areas shown in Figure 3.7-4 through Figure 3.7-8.

Although the amount of new agricultural treatment areas for Alternative 4B shown on Figure 3.7-5 would be only about 40 acres (based on the remediation activities, the Feasibility Study/Addenda), as described in Chapter 2, *Project Description*, the amount of agricultural treatment in this alternative (and other action alternative) is expected to be increased to address the expanded chromium plume. Based on the scaled up estimates, Alternative 4B could require up to 264 acres of new agricultural treatment. Figure 3.7-5 shows the effect of up to 168 new acres for Alternative 4C-2 (based on the Feasibility Study/Addenda, and a scaled up Alternative 4B could require more acres than shown on this figure. Thus, depending on their ultimate configuration, there could be contiguous agricultural treatment areas extending on a north-south axis for perhaps up to 2 miles in length under all action alternatives.

Although desert tortoise would be physically able to move through the agricultural treatment units and there would not be any physical barriers (like fences) to their movement, they would likely avoid the agricultural treatment areas because they would be largely unsuitable irrigated parcels that would not favor tortoise locomotion. This impact is potentially significant impact for all action alternatives because it could result in a substantial constraint of a general east-west movement pattern for desert tortoise individuals.

While feasible mitigation was reviewed for this impact, none of the following measures are recommended for the following reasons:

- Create w~~W~~ildlife movement corridors. A mitigation measure was considered to require PG&E to segregate new agricultural treatment areas (by perhaps 500 to 1,000 feet). This mitigation is not proposed because it is highly uncertain whether desert tortoise would actually use such corridors and because spreading out (as opposed to concentrating) agricultural areas would

actually increase fragmentation of habitat even further and would push more agricultural areas further north, which is considered counterproductive in terms of maintain habitat for the desert tortoise.

- Limit the number of agricultural treatment areas. A mitigation measure was considered to limit the areas new agricultural treatment such that substantial desert tortoise east-west movement areas could be maintained throughout the Hinkley Valley. For example, if agricultural treatment units were limited to the 40 acres for Alternative 4B included in the Feasibility Study/Addenda (and shown in Figure 3.7-5), then east-west movement areas would be maintained. This measure is not recommended because it would substantially slow down remediation and may impede hydraulic containment of the plume.

- Adopt one of the alternatives with less agricultural treatment. One mitigation option would be to adopt the No Project Alternative, but this would not meet the project objectives and was thus rejected. Another option would be to adopt Alternative 4B which would have the least amount of new agricultural treatment, but since this alternative may need to be scaled up to provide up to 264 acres of new agricultural treatment, this alternative would lower but would not avoid a potentially significant impact.

- Eliminate new agricultural treatment. One mitigation option would be to use a different remediation technology than new agricultural treatment. One option could include wide-scale above-ground treatment ("plume-wide pump and treat"). While this option would provide for hydraulic containment if extraction flows were sufficiently high, as discussed in Chapter 2, *Project Alternatives*, Section 2.8, this alternative would take approximately 50 years to reduce Cr[VI] concentrations throughout the plume to 50 ppb, approximately 140 years to reduce Cr[VI] concentrations to 3.1 ppb, and 210 years to reduce Cr[VI] concentrations to 1.2 ppb. This alternative was rejected because it does not meet the fundamental project objectives because it does not clean up chromium in groundwater within a meaningful period of time. In Chapter 2, Section 2.8, *Project Alternatives*, ~~Section 2.8,~~ also discusses why other alternatives were not carried forward fur further analysis.

**Mitigation Measures BIO-MM-1a to BIO-MM-1f, BIO-MM-1h, BIO-MM-1i, BIO-MM-1j** and **BIO-MM-4** would reduce this impact, but not to a less than significant level. Since no feasible mitigation was identified that would meet most of the project goal objectives and would reduce this impact to a less than significant level, the action alternatives are considered to result in a potentially significant and unavoidable impact related to desert tortoise movement (depending ultimately on the amount and configuration of new agricultural treatment areas).

### 3.7.6.5 Protected Trees

**Impact BIO-5: Removal of Protected Trees (Less than Significant, All Alternatives)**

During field surveys, Joshua trees, which are protected desert native plants under San Bernardino ordinance, were identified within the project area. If construction requires removal of Joshua trees or other potentially occurring locally-protected desert native plants, PG&E would be required to comply with the San Bernardino County Plant Protection and Management ordinance (Chapter 88.01 of the San Bernardino County Development Code and obtain a tree removal permit prior to initial of ground disturbance. Operations and maintenance activities under all alternatives are not expected to require the removal of individual plants, as infrastructure would already be in place during these activities. Compliance with the County's plant protection ordinance would ensure that

potential direct impacts to Joshua tree or other locally-protected plants would be avoided or minimized according to the provisions of the County's permit requirements. Therefore, this potential impact would be less than significant.

### 3.7.6.6 Conservation Plans

**Impact BIO-6: Conflicts with West Mojave Plan Conservation Requirements on BLM Land (No Impact, No Project Alternative; Less than Significant with Mitigation, All Action Alternatives)**

The West Mojave Plan and its provisions only apply to the areas that are located on federal lands owned by the BLM within the project area. A portion of the project area is on BLM land that is subject to the requirements of the West Mojave Plan. For the project portion on BLM land, there are areas designated for habitat conservation for desert tortoise, Mohave ground squirrel, burrowing owl and four of the special-status plant species (Barstow Woolly sunflower, desert Cymopterus, Mojave monkeyflower, and Parish's Phacelia) by the West Mojave Plan.

Under the No Project Alternative, future remedial activity would continue within the confines of the existing permitted remediation area (e.g., OU1/OU2). Direct conflicts with the West Mojave Plan conservation requirements on federal land are not expected because these areas are beyond the extent of activities under this alternative. Thus, the No Project Alternative would have no impact on West Mojave Plan implementation on BLM land.

For all action alternatives, there could be potential conflicts with the conservation requirements of the West Mojave Plan where remediation activities disturb BLM land. However, implementation of **Mitigation Measures BIO-MM-1a through BIO-MM-1l and BIO-MM-1o** and **Mitigation Measure BIO-MM-4** would minimize potential conflicts with conservation requirements of the West Mojave Plan on BLM land. In addition, the provisions of the West Mojave Plan that address specific desert tortoise, Mohave ground squirrel and burrowing owl avoidance, minimization and conservation measures could also be considered during agency consultations to obtain federal and state ESA permits if required. Therefore, this impact is considered less than significant with mitigation.

## 3.7.7 Mitigation Measures

**Mitigation Measure BIO-MM-1a: Implement Measures to Minimize, Reduce, or Mitigate Impacts <u>on</u> ~~to~~ Desert Tortoise during Construction**

<u>The following measures shall be implemented to reduce construction impacts to the desert tortoise. These measures shall be implemented in a manner consistent with any incidental take authorization issued by CDFG and USFWS. If the requirements below exceed those required by CDFG or USFWS, they shall still be implemented unless they directly conflict with or impede the requirements of CDFG or USFWS.</u>

- <u></u>Protocol-level surveys for desert tortoise will occur prior to construction either in April through May or September through October per the most recent protocol issued by the USFWS (U.S. Fish and Wildlife Service 2010b). The surveys will be conducted in the area proposed to be disturbed by the project and 1,500 meters from the edge of the proposed disturbance area to confirm the use of that area by desert tortoise. Any variation from this protocol would require approval by USFWS <u>and CDFG</u>. A report will be prepared at the end of each survey period.

- A preconstruction clearance survey will be completed for desert tortoise within each project area to ensure that all tortoise are absent, or that any tortoises that present are moved off site and out of harm's way per the most recent protocol issued by the USFWS (currently this is USFWS 2009). The protocol (USFWS 2009) states that two consecutive surveys would be conducted immediately prior to surface disturbance at each site within the project area.
- Desert tortoise found within the construction areas will be either allowed to move passively away or be physically relocated by an authorized handler to a location out of ~~away from~~ harm's way, but within their home range (defined by USFWS 2009 as less than 1,000 feet). If relocating desert tortoise, a translocation plan will need to be approved by CDFG and USFWS.
- Where possible, desert tortoise exclusion fencing will be placed along the perimeter of the proposed work areas prior to surface disturbance to prevent encounters with desert tortoise during construction activities. The specifications of the desert tortoise exclusion fencing will follow USFWS (Desert Tortoise Field Manual: Chapter 8. Desert Tortoise Exclusion Fence 2009c). Daily preconstruction sweeps within the proposed project area will be conducted before construction to ensure that desert tortoise are absent from the project area. Desert tortoise exclusion fencing will also be placed around all permanent buildings and structures where entrapment or negative interactions with tortoises could occur.
- All desert tortoise sighted within the proposed project area must be immediately reported and construction activity jeopardizing the tortoise must be halted until the approved USFWS and CDFG biologist is able to relocate the animal. If a desert tortoise is injured or killed, the authorized biologist must be notified, the injury or death documented, and the animal taken to a qualified veterinarian or the carcass removed by the biologist.
- An annual report submitted to CDFG and USWFWS will document desert tortoise seen, injured, killed, excavated, and/or handled, along with all pertinent details.
- Ongoing construction monitoring will ensure that desert tortoise observed within 100 feet of construction are actively monitored for a negative qualitative response from vibration.
- Any authorized biologist needs to be approved by USFWS and CDFG, and any monitors need to be approved by CDFG.

**Mitigation Measure BIO-MM-1b: Limit Footprint of Disturbance Areas within Special-Status Species Habitats.**

The area of disturbance will be confined to the smallest practical area, considering topography, placement of facilities, location of occupied desert tortoise, Mohave ground squirrel, and burrowing owl habitat, public health and safety, and other limiting factors, and will be located in previously disturbed areas to the extent possible. An Authorized Biologist or Environmental Monitor will assist the project foreman in locating such areas to avoid desert tortoise, Mohave ground squirrel, and burrowing owl mortality, minimize impacts to habitat, and ensure compliance with this measure and other pertinent regulatory documents. In areas where the project sponsor is unable to install exclusionary fencing, work area boundaries and access roads will be delineated with flagging or other marking to minimize surface disturbance outside of the approved work area. All disturbance limits need to be confirmed by the construction monitor. Special habitat features, such as burrows, identified by the Authorized Biologist will be avoided to the extent possible.

**Mitigation Measure BIO-MM-1c: Implement Pre-Construction and Ongoing Awareness and Training Program.**

All employees, subcontractors, and others who work on-site will participate in a desert tortoise, Mohave ground squirrel, ~~and~~ burrowing owl, American badger, Mojave River vole, desert kit fox, and sensitive plant species awareness program prior to initiation of construction activities. PG&E is responsible for ensuring that the awareness program is presented prior to conducting activities. Hard hat stickers to identify personnel who have attended the training and wallet-sized cards listing key best management practices are required. At a minimum, the awareness program will emphasize the following information relative to these species: (a) distribution on the job site; (b) general behavior and ecology; (c) sensitivity to human activities; (d) legal protection; (e) penalties for violating State or federal laws; (f) reporting requirements; and (g) project protective mitigation measures. The Authorized Biologist and/or Environmental Monitor will work with the project proponent to ensure that all workers have received the awareness program and understand the various components. Interpretation will be provided for non-English speaking construction workers.

**Mitigation Measure BIO-MM-1d: Conduct Ongoing Biological Monitoring during Construction.**

Biological monitors approved by CDFG will conduct daily construction monitoring of the desert tortoise exclusion fencing, as well as during clearing and grubbing (initial ground disturbance) of the work area. ~~This~~ Biological monitors will be familiar with desert tortoise, Mohave ground squirrel, and burrowing owl, as well as nesting birds. Once clearing and grubbing is complete, a biological monitor will conduct, at minimum, weekly spot checks to document compliance with the ~~Habitat Conservation Plan (HCP) and other~~ mitigation measures presented in this EIR and elsewhere. An on-call desert tortoise handler will be available should desert tortoise be encountered during construction activities.

**Mitigation Measure BIO-MM-1e: Minimize Potential Construction Hazards to Special-Status Species**

- No hazards to special-status species, particularly desert tortoise, such as open trenches and holes, will be left overnight without fencing or covering,
- No firearms or pets will be allowed at the work area. Firearms carried by authorized security and law enforcement personnel are exempt from this term and condition.
- Dust will be controlled. If water trucks are to be used, pooling of water will be avoided so to minimize the potential to attracting common ravens or potential predators of the desert tortoise.
- Except on paved roads with posted speed limits, vehicle speeds will not exceed 10 miles per hour through desert tortoise and Mohave ground squirrel habitat during travel associated with the authorized activity.

**Mitigation Measure BIO-MM-1f: Implement Measures to Minimize and Prevent Attraction of Predators during Construction and Operation.**

- Litter control measures will be implemented. Trash and food items will be contained in closed containers and removed daily to reduce the attractiveness or the area to

opportunistic predators such as common ravens (*Corvus corax*), coyotes (*Canis latrans*), and feral dogs.

- If water trucks are to be used, pooling of water will be avoided so to minimize the potential to attracting common ravens or other potential predators.
- Potential perches and nest substrates for the common raven will be reduced to the greatest extent practicable within permanent project facilities.
- A raven management plan will be developed by the project proponent ~~and approved by BLM~~ that will include at a minimum establishing a common raven population pre-remedial reference level~~baseline~~, with ongoing and post-construction monitoring of common raven populations, and triggers for adaptive management actions if ravens are occurring above ~~baseline~~ pre-remedial conditions and observed to be utilizing facilities and structures built as part of this project.

**Mitigation Measure BIO-MM-1g: Reduction of Project-Related Spread of Invasive Plant Species**

If reseeding of temporary disturbance areas or ornamental landscaping is proposed, the proposed seed palette will be reviewed by a biologist to ensure it does not contain plants that are considered invasive in California (based on the California Invasive Plant Inventory Database).

**Mitigation Measure BIO-MM-1h: Compensate Impacts on ~~to~~ Desert Tortoise and Mohave Ground Squirrel Habitat**

Compensatory mitigation for the loss of desert tortoise and Mohave ground squirrel habitat will be determined through consultation with CDFG and USFWS. The minimum compensation ratios for moderate to high quality habitat suitable to desert tortoise and Mohave ground squirrel are 3:1 for permanent impacts and 1:1 for temporary impacts (although no temporary impacts have been identified). For impacts to low quality desert tortoise and Mohave ground squirrel habitat, the minimum compensation ratio is 1:1 for permanent impacts. The minimum compensation ratio for impacts within a Desert Wildlife Management Area (DWMA) is ~~will be~~ 5:1 for permanent impacts. Final mitigation ratios will be determined during consultation with the appropriate resource agency, in accordance with the requirements of a Section 7 or Section 10 permit and/or a Section 2081 permit. Mitigation may include purchase, restoration, enhancement, and/or creation of desert tortoise and Mohave ground squirrel habitat.

Lands provided as mitigation for desert tortoise and Mohave ground squirrel may also be used to provide mitigation for any loss of burrowing owl habitat, if the land in question includes suitable habitat for the burrowing owl.

**Mitigation Measure BIO-MM-1i: Integrated Pest Management and Adaptive Management Plan for Agricultural Treatment Units**

An agricultural unit integrated pest management (IPM) plan will be developed and implemented for all new (and existing) agricultural units, and will be compliant with the California Statewide IPM year-round program for alfalfa and any other crops that may be proposed for use. The plan will explicitly detail an integrated pest management plan to ensure that risks of any proposed use of herbicides, pesticides, or rodenticides will pose a negligible risk to wildlife species.

Herbicides, pesticides, or rodenticides will only be used at new agricultural units if specifically authorized by USFWS and CDFG in the take permits for the desert tortoise and the Mohave ground squirrel. The adaptive management plan will detail the predicted harvest of the agricultural crops and how harvest will be conducted in such a manner to reduce potential impacts to nesting birds. The adaptive management plan will provide other population monitoring guidelines for predatory species such as brown-headed cowbird, with management actions that will be required if fields are found to be supporting these species. The adaptive management plan will also outline irrigation control to avoid pooled water~~, as well as dust control methods~~.

**Mitigation Measure BIO-MM-1j: Reduction of Night Light Spillover**

Exterior light fixtures and standards will be designed to be fully shielded, directing light downward below the horizontal plane of the fixture height. A detailed lighting plan will be inspected by a biologist to ensure that the expected light spillover has no potential to impact special-status species.

**Mitigation Measure BIO-MM-1k: Implement Other Measures to Minimize, Reduce, or Mitigate Impacts ~~to~~ on Mohave Ground Squirrel**

- A Mohave ground squirrel focused protocol survey will be completed prior to construction in the project study area where construction is proposed following protocol established by CDFG (2003). For habitat loss of greater than 180 acres, the Department requires special survey protocol(s) to be developed through its consultation with either the project proponent or the local lead agency (if appropriate) or both entities.
- If any Mohave ground squirrels are uncovered by excavation during construction, work must stop in the immediate area and the project biologist will be immediately notified.
- If any Mohave ground squirrels are injured or killed during the course of construction, work must stop in the immediate area and the project biologist will be immediately notified. Only the authorized biologist will handle, and transport injured animal to a qualified veterinarian.

**Mitigation Measure BIO-MM-1l: Implement Other Measures to Minimize, Reduce, or Mitigate Impacts ~~to~~ on Burrowing Owl**

- To confirm the current existing condition for burrowing owls in the project study area, a focused nesting season survey for burrowing owl will be completed for all potential disturbance limits and a minimum 400 feet buffer area, where accessible, prior to construction. This focused survey will utilize the most recent CDFG protocol (including any variations in that protocol that may be approved by CDFG for the survey).
- A preconstruction survey for burrowing owls will occur no greater than 14 days and a second preconstruction survey will occur 24 hours prior to commencing ground disturbing or construction activities. The limits of this preconstruction survey will include the disturbance area and a 400-foot buffer.
- Avoid disturbing occupied burrows during the nesting period, from February 1 through August 31 unless it is verified that the birds have not begun egg-laying. Work may only commence when it is determined that juvenile owls from those burrows are foraging independently and capable of independent survival.

- Avoid impacting burrows occupied during the non-breeding season (September 1–January 31) by migratory or non-migratory resident burrowing owls.
- An avian protection plan will be developed in consultation with CDFG to address burrowing owls or signs of burrowing owls should they be found on site during the focused nesting or preconstruction surveys. Unless otherwise approved by CDFG, the minimum no construction buffers will be 160 feet for occupied burrows during the non-breeding season of September 1 through January 31 and 250 feet during the breeding season of February 1 through August 31.
- If burrowing owls and their habitat can be protected in place on or adjacent to a project area, the use of buffer zones, visual screens (such as hay bales) or other feasible measures while project activities are occurring will be used to minimize disturbance impacts. These will be outlined in the avian protection plan.
- On-site passive relocation will be avoided to the greatest extent practicable, and only implemented if avoidance cannot be met. Passive relocation is defined as encouraging owls to move from occupied burrows to alternate natural or artificial burrows. A passive relocation plan will be detailed in the avian protection plan.
- Compensation provided for desert tortoise and Mohave ground squirrel will also provide habitat for burrowing owls should there be an unavoidable impact to this species.

**Mitigation Measure BIO-MM-1m: Minimize Impacts ~~to~~ on American Badger and Desert Kit Fox Occupied Dens**

If there is evidence that a burrow may be occupied by a badger or a kit fox during preconstruction surveys (see BIO-1a), all construction activities will cease within a 100-foot buffer of the burrow during the natal season (February–July) unless otherwise authorized by CDFG. Removal of an occupied American badger or desert kit fox burrow at any time of the year will require coordination with CDFG.

**Mitigation Measure BIO-MM-1n: Avoid Impacts ~~to~~ on Nesting Loggerhead Shrike, Northern Harrier, and Other Migratory Birds (including Raptors and excluding Burrowing Owls)**

Pursuant to the federal Migratory Bird Treaty Act and CDFG code, impacts to bird nests will be avoided. To avoid any impacts on migratory birds, resulting from construction activities that may occur during the nesting season ~~the nesting season~~, February 1 through August 31, the following measure will be implemented:

- A qualified biologist will conduct a preconstruction survey of the proposed construction site and 250 foot buffer area around the site. This preconstruction survey will commence no more than 7 days prior to the onset of construction, such as clearing and grubbing and initial ground disturbance.
- If a nest is observed, an appropriate buffer will be established. For nesting passerine birds the minimum buffer will be 50-feet. For nesting raptors, the minimum buffer will be 250 feet. These minimum buffers could be reduced with approval by CDFG based on the field conditions and disturbance tolerance of each species.

- All no-construction activity buffer areas will be clearly demarcated in the field with stakes and flagging that are visibility to construction personnel.

**Mitigation Measure BIO-MM-1o: Implement Measures Required to Minimize, Reduce, or Mitigate Impacts ~~to~~ on Special-Status Plants**

- To confirm the presence/absence and quantify of special-status plant species populations (such as Lane Mountain milk-vetch, Mojave monkeyflower, Clokey's cryptantha, desert cymopterus, Barstow woolly sunflower, Mojave menodora, creamy blazing star, beaver dam breadroot, and Parish's phacelia) in specific areas where remedy facilities may be constructed, a special-status plant survey will be completed prior to construction in the limits of disturbance and a 100-foot buffer that are proposed in allscale and creosote scrub habitats, desert dune habitat, and the Mojave River wash habitat. The focused survey for these species should be conducted by a qualified biologist during the appropriate blooming period (approximately March–July), or when the plant is readily identifiable, prior to the initiation of construction.
- If any listed plant species are observed during focused surveys of the work areas ~~(see Mitigation Measures BIO-MM-3 and BIO-MM-6)~~, the extent of the population will be clearly demarcated in the field by protective fencing, lath stakes, and/or flagging, as appropriate, for avoidance and the regulatory agencies will be notified. If project related impacts to a listed plant species will occur, initiation of consultation with CDFG and or USFWS will be required. Avoidance of listed species is the first priority; disturbance shall only be approved if the Water Board, CDFG and/or USFWS all determine that complete avoidance is infeasible.
- If any plant species that are not listed under CESA or ESA but are identified as special-status species ("non-listed plant species") are observed during focused surveys of the work areas, the extent of the population will be clearly demarcated in the field by protective fencing, lath stakes, and/or flagging, as appropriate, for avoidance. Avoidance will occur to the maximum extent feasible. If impacts are proposed to non-listed CRPR rank 1A, 1B, or 2 plant species, a brief analysis will be completed to determine ~~if the removal of those plant species is a significant adverse impact under CEQA because of their rarity at a local or regional scale, or because they could comprise an important or unique population~~the appropriate mitigation. Additional measures as a result of this analysis may be required, such as seeding, transplanting, collection of seeds to be used for the future conservation of the species, and/or compensatory mitigation habitat. Avoidance of non-listed, but rare species is the first priority; disturbance shall only be approved if the Water Board and CDFG both determine that complete avoidance is infeasible.
- A biological monitor who has observed the location of the listed and non-listed plant species to be avoided will conduct a tailgate session, informing the work crew of the appearance and location of the plant species prior to initiation of work activities.

**Mitigation Measure BIO-MM-1p: If Remedial Actions Affect Mojave Fringe-toed Lizard Habitat, than Compensate for Habitat Losses**

- Compensatory mitigation for the loss of Mojave fringe-toed lizard habitat will be determined through consultation with CDFG. The minimum compensation ratio for Mojave fringe-toed lizard habitat will be 3:1.

**Mitigation Measure BIO-MM-2: Habitat Compensation for Loss of Sensitive Natural Communities**

Avoidance of California joint fir scrub, desert dune habitat and dune land soils is the first priority; encroachment shall only occur if the Lahontan Water Board, USFWS, and CDFG all concur that complete avoidance is infeasible. If new remediation activities result in the permanent removal and loss of sensitive natural communities such as the California joint fir scrub and desert dunes habitat and dune land soils, a compensatory mitigation program or plan will be developed and implemented through consultation with the USFWS, CDFG, and the Lahontan Water Board. Compensatory mitigation may include a fee-based program and/or direct habitat replacement on a minimum 1:1 basis and in accordance with those agencies' recommendations.

Lands provided as mitigation for desert tortoise, Mohave ground squirrel, Mojave fringe-toed lizard, and burrowing owls may also be used to provide mitigation for any loss of sensitive nature community habitat, if the land in question includes sensitive natural communities.

**Mitigation Measure BIO-MM-3: Measures Required to Minimize, Reduce, or Mitigate Impacts ~~to~~ on Waters and/or Wetlands under the Jurisdiction of the State**

- Construction activity and access roads will be avoided in all drainages, streams, dry lake beds, pools, or other features that could be under the jurisdiction of the U.S. Army Corps of Engineers (USACE), Lahontan Water Board, and/or CDFG, if feasible. If impacts to these features are identified, a formal jurisdictional delineation for submittal to the agencies may be required.
- If impacts to USACE, RWQCB, and/or CDFG jurisdiction waters or wetlands are identified, the project applicant will comply with the permitting requirements imposed by USACE, Lahontan Water Board, and/or CDFG, as appropriate.
- Remedial actions shall avoid encroachment on the Harper Lake playa itself to the maximum extent feasible. If encroachment is necessary on the playa, PG&E shall demonstrate the rationale why encroachment is unavoidable to the Water Board and CDFG. If the Water Board and CDFG determine that the encroachment is necessary, PG&E shall mitigate for all temporary or permanent disturbance on a minimum 3:1 ratio (3 acres mitigation to 1 acre impact). Plans for mitigation must be approved by RWQCB and CDFG.

**Mitigation Measure BIO-MM-4: Implement West Mojave Plan Measures to Impacts ~~to~~ on DWMAs on BLM Land.**

Pertinent measures contained within the Final Environmental Impact Report and Statement for the West Mojave Plan (BLM 2005) will be implemented to minimize potential impacts to special-status species within conservation areas located on federal land, if and where project activities would infringe on their suitable habitat. Consultation with BLM will be required prior to implementation of any activities. According to the FEIR for the West Mojave Plan, these activities will generally include the following (the detailed list of mitigation measures can be found in the FEIR for the West Mojave Plan):

- Avoid of construction activities (particularly linear projects through Tortoise Survey Areas) when tortoises are most likely to be active, which generally occurs between February 15 and November 15.

- Conduct pre-construction surveys (according to approved BLM guidelines [2005] and USFWS' Guidelines for Handling Desert Tortoises [USFWS 2009]) for presence or absence of species and monitor and report any violations of protective stipulations. Only authorized biologists may conduct surveys and handling of any live individuals.
- Authorize biologists and environmental monitors will monitor and report any violations of protective stipulations, record and report any instances where tortoises or other covered species were encountered, upon completion of construction activities report on the effectiveness and practicality of mitigation measures (including information on collected, killed or injured individuals) and the acres of habitat that were removed or disturbed.
- Pay compensatory fee. Within the Habitat Conservation Areas on BLM land, the compensatory fee will be based on a ratio of 5:1 (five times the average value of an acre of land within the habitat conservation area).
- Conduct burrowing owl survey. For burrowing owl habitat within the DWMAs, a burrowing owl survey utilizing the four-visit CDFG protocol will be conducted. The applicant will provide to all construction personnel an informational brochure with an illustration of a burrowing owl, a description of its burrows and how they can be recognized, and a summary of the bird's life history. If at any time prior to grading the applicant becomes aware of burrowing owls on the site, he will be instructed to call a number where a biologist can respond quickly by instituting the minimization measures.
- Conduct botanical surveys. For Desert cymopterus, if disturbance within suitable habitat located within the Superior Cronese DWMA is proposed, the Applicant will be required to perform botanical surveys for this species, and if the plant is located, to avoid all occurrences to the maximum extent practicable. Incidental take will be limited to 50 acres.