Draft Environmental Impact Report

for the

Topock Compressor Station
Groundwater Remediation Project

California Department of Toxic Substances Control

SCH #2008051003

Prepared for:

California Department of Toxic Substances Control
1001 I Street
Sacramento, CA 95814

April 2010

Draft Environmental Impact Report

for the

Topock Compressor Station
Groundwater Remediation Project

California Department of Toxic Substances Control

SCH #2008051003

Prepared for:

California Department of Toxic Substances Control
1001 I Street
Sacramento, CA 95814

Contact:
Aaron Yue
Project Manager
5796 Corporate Avenue
Cypress, CA 90630
Ayue@dtsc.ca.gov

Prepared by:

AECOM
2022 J Street
Sacramento, CA 95811

April 2010

AECOM

TABLE OF CONTENTS

Section **Page**

TABLE OF CONTENTS

Continued **Page**

TABLE OF CONTENTS

Continued **Page**

TABLE OF CONTENTS

Continued **Page**

TABLE OF CONTENTS

Continued **Page**

Appendices (on CD-see back cover)

TABLE OF CONTENTS

Exhibits **Page**

TABLE OF CONTENTS

Continued **Page**

TABLE OF CONTENTS

Continued **Page**

Tables **Page**

TABLE OF CONTENTS

Continued **Page**

TABLE OF CONTENTS

Continued **Page**

1 SUMMARY

1.1 INTRODUCTION

This summary provides an overview of the Topock Compressor Station Groundwater Remediation Project (proposed project) and the environmental analyses that are contained within this draft environmental impact report (DEIR). Past activities at the Pacific Gas and Electric Company's (PG&E's) Topock Compressor Station (compressor station) have resulted in contamination of groundwater with total chromium [Cr(T)] and hexavalent chromium [Cr(VI)], as well as other contaminants including molybdenum, selenium, and nitrates, which, under certain exposure conditions, are harmful to human health. Corrective actions developed under the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process, which are designed to evaluate the nature and extent of releases of hazardous substances and then implement appropriate protective measures, are needed to ensure the long-term health of humans and the environment. Thus, the proposed project is to implement a final corrective action remedy to address groundwater contamination in the project area.

The long-term cleanup options for contamination in groundwater at the compressor station have been evaluated and are summarized in the *Final Groundwater Corrective Measures Study/Feasibility Study Report for Solid Waste Management Unit* (*SWMU) 1/Area of Concern (AOC) 1 and AOC 10, PG&E Topock Compressor Station, Needles, California* (Final CMS/FS), which was completed in December 2009 (CH2M Hill 2009, included in Appendix CMS of this EIR). The Final CMS/FS was developed under the RCRA and CERCLA process and involved extensive evaluation and comment by stakeholders, agencies, tribal governments, and the public. The Final CMS/FS identifies and evaluates remedial alternatives and provides the basis for selecting a recommended alternative to address the defined objectives for the remedial action. As the lead agency under the RCRA, the California Department of Toxic Substances Control (DTSC) has reviewed the alternatives considered in the Final CMS/FS and has determined that Alternative E—In Situ with Freshwater Flushing is the remedy that best achieves the project goals within a reasonable time frame and is therefore carried forward in the statement of basis issued under the RCRA. Alternative E—In Situ with Freshwater Flushing is also set out for analysis as the proposed project in this EIR.

1.2 SUMMARY OF THE PROPOSED PROJECT

DTSC is the lead agency for the preparation of this EIR, which addresses the potential environmental effects of actions associated with cleanup of groundwater contamination at the compressor station. Groundwater near the compressor station has been contaminated by chemicals associated with historical releases in areas known as Bat Cave Wash and East Ravine. The main contaminant of concern in groundwater is Cr(VI), which was used in the past as an additive to the cooling water at the compressor station, and is harmful to human health and ecological receptors in the environment. Other chemicals present in the groundwater include Cr(T), molybdenum, selenium, and nitrates. Although currently not being used as a drinking water source, the affected groundwater has the potential to come into contact with drinking water wells and the Colorado River. Cleanup of the contaminated groundwater plume is being designed to protect all identified potential receptors and maintain groundwater as a resource.

1.2.1 PROJECT LOCATION

The compressor station is located in eastern San Bernardino County, California in the Mojave Desert, approximately 12 miles southeast of the City of Needles, California, and 1 mile southeast of the Moabi Regional Park in California (see Exhibit 3-1 in Chapter 3 of this document). The compressor station is one-half mile west of the community of Topock, Arizona, which is situated directly across the Colorado River from the compressor station, and is 5 miles south of Golden Shores, Arizona. The compressor station is approximately 1,500 feet west of the Colorado River (California shoreline) and less than 1 mile south of Interstate 40 (I-40). It is located on 66.8 acres of land owned by PG&E. The groundwater plume subject to planned remediation efforts extends from the

compressor station to the north, as depicted in Exhibit 3-2. This exhibit also shows the area within which remediation activities are expected to occur. This "project area" encompasses the area where potential environmental impacts associated with the proposed project are mostly likely to occur, although some impacts, such as air quality or transportation, could have effects outside of this area as described in the resource areas. The total project area in which potential remediation and monitoring facilities could be located is approximately 779.2 acres.

1.2.2 PROJECT OBJECTIVES

The objectives of the proposed project are defined based on the conclusions of the Ground Water Human Health and Ecological Risk Assessment (GWRA) and applicable or relevant and appropriate requirements (ARARs) identification, which were developed in the Final CMS/FS (PG&E 2009). The Remedial Action Objectives (RAOs) for the project are intended to provide a general description of the cleanup objectives and to provide the basis for the development of site-specific remediation goals. In accordance with CERCLA guidance, RAOs specify the contaminant(s) of concern, the exposure routes and receptors, and an acceptable contaminant concentration for each exposure pathway (EPA 1988a and 1988b, cited in CH2M Hill 2009: 3-7, which is included in Appendix CMS of this EIR). Protective measures can be achieved by limiting or eliminating the exposure pathway, reducing or eliminating chemical concentrations, or both. Similarly, RCRA corrective action guidance describes goals for final cleanup both in terms of protecting human health and the environment as well as performance standards that must also include controlling future sources of releases (EPA 2004). Further, California State Water Board Resolution 92-49 requires the selection of a remedial alternative that would achieve compliance with RAOs within a reasonable timeframe.

The primary objective of the proposed project is to clean up the groundwater contamination related to the historical release of chemicals into Bat Cave Wash and the East Ravine near the compressor station in a manner consistent with all applicable regulatory requirements, and within a reasonable period of time when compared with other viable alternatives. These objectives establish specific cleanup goals for Cr(VI) and Cr(T), and address the other identified chemicals of potential concern (COPCs) (molybdenum, selenium, and nitrates) through monitoring and institutional controls. The RAOs for groundwater and project objectives are to:

- prevent ingestion of groundwater as a potable water source having Cr(VI) in excess of the regional background concentration of 32 micrograms per liter (µg/l),
- prevent or minimize migration of Cr(T) and Cr(VI) in groundwater to ensure concentrations in surface waters do not exceed water quality standards that support the designated beneficial uses of the Colorado River [11 µg/l Cr(VI)],
- reduce the mass of Cr(T) and Cr(VI) in groundwater at the project area to comply with ARARs, which would be achieved through the cleanup goal of 32 µg/l of Cr(VI), and
- ensure that the geographic location of the target remediation area does not permanently expand following completion of the remedial action.

1.2.3 DESCRIPTION OF THE PROPOSED PROJECT

The proposed project involves flushing the contaminated groundwater plume through an in situ reactive zone (IRZ) of extraction and injections wells and installing extraction wells near the Colorado River to hydraulically control the plume, accelerate cleanup of the groundwater within the floodplain, and flush the groundwater with elevated Cr(VI) through the IRZ. The proposed project consists of five main elements: (1) an IRZ zone along a portion of National Trails Highway, (2) extraction wells near the Colorado River that would pump approximately 640 gallons per minute (gpm) of contaminated groundwater that would be amended with organic carbon before reinjection in the western end of the plume, (3) approximately 500 gpm of freshwater that would be injected west of the plume to accelerate groundwater flow, (4) institutional controls on groundwater use, and (5) monitoring.

The project description is divided into sequential phases of project implementation: construction, operations and maintenance, long-term monitoring, and decommissioning. It is estimated that the duration of these three project phases is 3 years, 29 years (could be up to 110 years), 10 years, and 2 years, respectively. Table 1-1 presents a summary of project features.

The ultimate number and specific locations of the elements that make up the proposed project (e.g., remediation wells, monitoring wells, pipelines, freshwater intake locations, and associated infrastructure) have not been determined at this time because the locations are dependent on the final remediation system design. The actual number, location, and configuration of the extraction, treatment, and injection systems and/or changes to the type, method, and configuration of the treatment delivery systems may occur to enhance performance of the remedy to attain the cleanup goals and to respond to site conditions and performance issues. Locations of remedial structures would be determined through communication and discussions with the landowners and/or other entities with rights-of-way. Remedial structure locations also would be determined in consideration of treatment efficiency, accessibility for construction and operation and maintenance, topography, sensitive cultural and biological resources, and existing infrastructure. For these reasons, the environmental analysis of the proposed project is based on the maximum area that is expected to be affected by the construction, operation, maintenance, and decommissioning of the proposed project.

1.2.3.1 REMEDIATION FACILITIES

The proposed project would involve the in situ treatment of contaminated groundwater. In situ treatment of groundwater refers to the reduction in mass, toxicity, mobility, volume, and/or concentration of chemicals of concern in groundwater, such as Cr(VI), using treatment technologies that treat groundwater in place, as opposed to pumping and circulating water through a separate treatment plant. In situ treatment would be performed by manipulating the subsurface environment by placing a degradable chemical compound (termed a “reductant”) to create reducing conditions to convert Cr(VI) in groundwater to the relatively insoluble trivalent chromium [Cr(III)]. The reduced chromium would precipitate or become adsorbed onto aquifer solids.

The in situ treatment system would include installing remediation wells that would generally consist of extraction and injection wells and an IRZ that would comprise both. The remediation would include a maximum of 110 new remediation wells, and wells could be replaced throughout the operation and maintenance phase, if necessary.

The IRZ portion of the proposed project would create a treatment zone where groundwater would be extracted and injected, and would therefore include both injection and extraction wells. The IRZ would be constructed using a series of wells that could be used either as injection or extraction wells to circulate groundwater and distribute the reductant. The water with the reductant would be injected under pressure into the aquifer using a network of wells to form the treatment zone. The IRZ is expected to be located along a portion of National Trails Highway. IRZ well vaults would be approximately 6 feet long by 8 feet wide. Well vault would extend approximately 8 feet below the surface, and would be constructed flush with the ground surface to the extent feasible.

It is anticipated that approximately 50% of remediation wells would be located in what is known as the floodplain area (along the Colorado River, or eastern part of the project area), with the remaining wells located within the upland areas (western part of project area), and bedrock areas (southern part of project area). Extraction wells would likely be located near the Colorado River to provide hydraulic control to prevent contaminated groundwater from reaching the river. Extraction near the river would also help to draw carbon-amended water a portion of the way across the floodplain to treat the existing Cr(VI) in the alluvial zone of the floodplain aquifer east of National Trails Highway. The extracted water would be amended with carbon substrate or other reductants and reinjected in the western portion of the plume, where it would help induce a hydraulic gradient to accelerate the movement of the groundwater through the IRZ, where it would be treated. To further accelerate the movement of the contaminated groundwater toward reducing zones and to enhance the distribution of the reductants, additional injection wells would likely be constructed in areas to the west and north of the plume and within the southern part of the plume.

Table 1-1
Summary of Project Features

Structure Type	Quantity	Size	Location[1]
Extraction Wells	Up to 110[2]	6 feet long by 8 feet wide by 8 feet deep	Likely near the Colorado River and the compressor station
Injection Wells			West and north of plume, and near the compressor station
In Situ Reactive Zone Wells		6 feet long by 8 feet wide by 5 feet deep	Likely between the National Trails Hwy and Colorado River
		6 feet long by 8 feet wide by 8 feet deep	
Reductant Storage Facilities Aboveground tanks	Total tank storage capacity of up to 100,000 gallons; number of tanks to be determined during design phase	35,000 sq. ft. maximum footprint[3] 25,000 gallon capacity/tank 12 feet wide, 24 feet long, and up to 15 feet tall	Within defined project area, likely near injection wells, at the compressor station, at MW-20 bench, or at the IM-3 Facility
Freshwater Supply Wells OR Freshwater Intake Structure and Treatment System	Undetermined number of wells, 6 feet long by 8 feet wide by 8 feet deep OR 1 intake structure	Typical freshwater well size OR 40,000 sq. ft. maximum footprint to include 10,000 sq. ft. maximum building size/25 feet tall	Wells would either be in Arizona or California but within defined project area OR On Colorado River
Monitoring Wells	Up to 60, not including replacement wells	4 sq. ft. flush-mounted concrete pad with manhole-type cover or aboveground completion consisting of steel protective casing[4]	In and around the perimeter of the plume
Water Conveyance (pipelines)	Up to 50,000 linear feet	Trenches up to 5 feet wide, 3 to 4 feet deep	Above and belowground Exact locations TBD (intent to locate main infrastructure corridors with existing utility corridors)
Utilities (electrical and conduit cable)	Up to 50,000 linear feet		
Roadways[5]	Up to 6,000 linear feet	Roadway size/width dependant on location and not available	Within the defined project area

Note: sq. ft. = square feet; TBD = to be determined.

[1] Refer to Project Description Exhibit 3-4 for conceptual facilities locations

[2] Includes all remediation wells – extraction, injection (including freshwater injection) and IRZ wells, but does not include replacement wells

[3] This total maximum area may consist of facilities (tanks, control buildings and associated equipment) at multiple locations. Reductant storage/delivery area(s) would have lighting for safety and security purposes.

[4] Refer to Project Description Exhibit 3-7

[5] Roads would be either paved with asphalt or gravel, or left unpaved depending on location and use. All new roads would be removed following determination that the remedial or monitoring structure is no longer needed. As such, no permanent roads are proposed.

Other Ancillary Structures – protective bollards around, for example, structures, electrical boxes, and solar panels. These structures would be located throughout the defined project area.

Source: Data compiled by AECOM in 2010

The reductant for the in situ portion of the proposed project would be stored in aboveground tanks. The maximum footprint of the area in which the tanks, control buildings, and associated equipment would be located is estimated to be a maximum of 35,000 square feet, which may consist of facilities at multiple locations within the defined project area [e.g., at the compressor station, the IM-3 Facility, or near the monitoring well 20 bench (MW-20 bench) area].

1.2.3.2 FRESHWATER FLUSHING

Freshwater flushing involves using injection wells to introduce clean water to the aquifer. These injection wells may be located beyond the margin of the plume and would contribute to flushing groundwater through the IRZ. The injection of freshwater at an assumed rate of approximately 500 gpm would induce a hydraulic gradient to accelerate the movement of the site groundwater through the IRZ, where it would be treated. In addition to the 500 gpm of freshwater, 640 gpm of treated groundwater extracted from the plume would be reinjected. This combined freshwater and treated groundwater injection would also serve to constrain westward movement of the carbon amended water from the IRZ and flush much of this water eastward toward the IRZ and extraction wells.

Freshwater injection would involve piping water in from an off-site source. Freshwater for the flushing portion of the proposed project would come from PG&E's existing Lower Colorado Water Supply Subcontract entitlements and would be pumped either from new or existing Arizona wells, from new wells in California north of the compressor station, or from a new surface water intake at or near the Colorado River. Freshwater would be transported by pipeline to injection wells located north, west, and/or south of the plume. The source of freshwater may change during the operation and maintenance phase of the remedy; not all freshwater supply structures (wells, intakes, pipelines) would need to be constructed at the outset of the remedy, but could be constructed as needed during the operation and maintenance phase. To accommodate the flow volume that would be required for remediation, new pipelines would likely need to be constructed connecting the water supply with the injection wells.

Depending on the source of water used for flushing, minor pH adjustment might be required to make the water chemically compatible with the aquifer where it would be injected and to prevent scaling in the injection wells. If needed, this pH adjustment would require a small system with equipment such as a chemical storage tank(s), secondary containment, a feed pump, and a security enclosure such as a building or fence. If surface water from the Colorado River is used, a surface water intake would typically consist of belowground perforated or solid pipes or rectangular channels extending into the river, or an alternative approach is to install pumps below the river surface with riser pipes extending to a concrete and steel platform. If surface water from the Colorado River is the source of water for flushing, filtration may be needed to remove sediment and bacteria (for injection well maintenance). Water treatment facilities that would be needed for this purpose would likely be housed in one or two buildings. Freshwater treatment systems, such as tanks and buildings, would be a maximum of 10,000 square feet and 25 feet tall, with an overall footprint of up to 40,000 square feet.

1.2.3.3 MONITORING WELLS

Groundwater monitoring wells would be installed as part of the proposed project to evaluate site conditions and contaminant levels and to assess the performance of the remediation system over time. Monitoring wells would be strategically placed to assess contaminant levels of groundwater and progress of in situ treatment and freshwater flushing. Monitoring would include the collection, management, and reporting of groundwater quality, surface water quality, and operational data from the remedial system. In addition to using existing and future wells, monitoring would continue to include periodic sampling and analysis of surface water or pore water in the Colorado River. Monitoring would be required during the operation and maintenance phase and for an estimated 10 years following completion of the remedy.

A maximum of 60 new monitoring wells are anticipated as part of the proposed project. In addition, monitoring wells could be replaced throughout the operation and monitoring phase, as necessary. Monitoring wells are

typically between 4 and 8 inches in diameter and are finished at the ground surface with a concrete pad (typically 4 square feet) and include a manhole-type cover provide access to the well. Where a ground surface completion is not feasible, monitoring wells may be installed with aboveground completion with steel protective casing. Monitoring wells would be situated in areas that provide relevant data on groundwater hydraulics and chemistry. In the interior of the plume, monitoring wells would provide data on the operation of the in situ remediation systems. These wells would monitor the changes in water levels and water quality in the active part of the remediation system. Around the perimeter of the plume, monitoring wells are usually installed for compliance monitoring or as "sentry" wells just outside of the contaminated area. Monitoring wells would be sited with consideration of available access, existing infrastructures including transportation and pipeline corridors, sensitive areas, and property owners.

1.2.3.4 WATER CONVEYANCE, UTILITIES, AND ROADWAYS

The proposed project would require pipelines to transfer freshwater, treated water, and reductant-amended water throughout the project area. It would also require other utility connections such as electrical power, signal communications, and natural gas. An estimated maximum of 50,000 linear feet of pipeline may be required to serve the proposed project. Electric conduit and cable would be installed to supply communication and power to pumps and instrumentation and would typically be installed underground in the same location as piping. As with pipelines, an estimated maximum of 50,000 linear feet of electrical and signal communications is expected to be required for project implementation. Wireless transmitters and receivers, like cellular or radio devices, may be used to communicate to remote areas that have little power demand, thereby reducing the amount of trenching required to install communications-related equipment. Small solar panels may be installed to provide supplemental power, or as a primary power source for a lower power demand, such as for instrumentation and communication systems.

A road network for accessing the existing network of monitoring wells runs throughout the project area. This road network would be used where feasible for construction and operation of the proposed project; however, additional roads would be required. A maximum of 6,000 linear feet of new roads could be needed throughout the project area, for both construction and long-term operation and maintenance of the proposed project. An access road would be required to provide service to each well. Following determination that the remedial or monitoring structure is no longer needed, the road would be closed and restored to pre-project conditions. As such, no permanent roads are proposed under any of the alternatives.

1.2.3.5 INSTITUTIONAL CONTROLS

Institutional controls are non-engineering mechanisms, such as legal or contractual restrictions on property use, which are used to help minimize the potential for human exposure to contamination and/or protect the integrity of a remedy. Institutional controls work by limiting land or resource use and/or by providing information that helps modify or guide human behavior at a site. Some common examples of institutional controls include zoning restrictions, building or excavation permits, prohibitions on well drilling, and easements and covenants. Institutional controls are determined based on the specific conditions at a site and may be temporary or permanent. Institutional controls would likely consist of restrictions against development of the groundwater as a potable water supply during the cleanup period and restrictions against removal of or damage to remedial structures (e.g., wells, pipelines, tanks) during the cleanup period. Maintaining institutional controls would not require any physical disturbance in the project area.

1.2.4 DECOMMISSIONING OF THE PROPOSED PROJECT

Following completion of the remedial action, when it is determined through monitoring that cleanup of contaminated groundwater plume to background levels or 32 µg/l of Cr(VI), and/or following the determination that the remedial structures are no longer needed, the remedial facilities (e.g., in situ reductant storage and delivery systems, foundation material, process controls/instrumentation systems, and the Interim Measure 3

Groundwater Extraction and Treatment Facility [IM-3 Facility]) would be decommissioned. After deconstruction and decommissioning of the facilities, the areas would be restored using decompaction and grading techniques designed to decrease erosion and accelerate revegetation of native species. The decommissioning of monitoring wells would occur approximately 10 years after the decommissioning of remediation wells. It is estimated that the length of time required to decommission all elements of the proposed project would be up to 2 years in total.

1.3 SUMMARY OF PROJECT ALTERNATIVES

The Final CMS/FS presents the identification and evaluation of various remedial alternatives to address the remedial action goals for groundwater contamination associated with the historic discharges to Bat Cave Wash (SWMU 1/AOC 1) and within AOC 10 (East Ravine) at the compressor station. The Final CMS/FS examined a total of nine remedy alternatives (Alternatives A through I). As described above, the proposed project is based largely on what is defined as Alternative E—In Situ Treatment with Freshwater Flushing. The following provides a summary of each of the alternatives that are considered in this EIR. For a full discussion of the alternatives and an evaluation of their potential environmental effects, refer to Chapter 8, "Alternatives to the Proposed Project."

1.3.1 ALTERNATIVE B—MONITORED NATURAL ATTENUATION

Under Alternative B, no active treatment to reduce Cr(VI) concentrations in groundwater would occur. This alternative would rely only on the naturally reducing conditions to remove Cr(VI) from groundwater in the project area's shallow floodplain. These reducing conditions are derived from naturally occurring organic carbon in the fluvial deposits associated with the Colorado River. Wherever the natural reducing capacity of the fluvial material is present, Cr(VI) is converted to its stable and less toxic form of Cr(III), which is essentially immobile. The reducing conditions in the fluvial sediments provide a natural geochemical zone that limits or prevents the movement of Cr(VI) through the fluvial sediments adjacent to and beneath the Colorado River. Under Alternative B, up to 60 additional monitoring wells could be installed, not including replacement wells. No remediation wells or associated facilities (i.e., pipelines, roads, and utility connections) are proposed. While it is likely that Alternative B would have the least amount of initial ground disturbing activity because of the absence of remediation facilities, Alternative B has the longest estimated time to clean up (from 220 to 2,200 years) and resulting ground disturbance from replacement of monitoring wells over this cleanup period.

1.3.2 ALTERNATIVE C—HIGH VOLUME IN SITU TREATMENT

Alternative C would involve active in situ groundwater treatment by distributing an organic carbon substrate across the entire plume through high-volume pumping by of wells installed primarily in previously disturbed areas. Under Alternative C up to 310 new wells could be installed, of which 240 would be remediation wells (including extraction, injection, and IRZ wells) and 70 would be monitoring wells. Of the 240 remediation wells, an estimated 50% would be upland remediation wells, 40% would be floodplain remediation wells, and 10% would be bedrock remediation wells (PG&E 2010, PG&E 2009:Table D-19B). This alternative would have the largest amount of remediation wells and infrastructure, and therefore the largest amount of associated ground disturbance.

Alternative C would locate injection wells within the center of the plume and extraction wells at the plume margin. An organic carbon substrate would be injected to create geochemically reduced conditions and convert the harmful and soluble Cr(VI) to the insoluble form of chromium, Cr(III). Since the reduced chromium would be deposited in the soil formation instead of dissolved in groundwater, Cr(VI) would be removed from groundwater. Under Alternative C, groundwater would be extracted along National Trails Highway and along the western margin of the plume, amended with a carbon substrate, and injected into the injection wells within the center of the plume. The extraction/injection well lines would form a recirculation system to induce a hydraulic gradient to distribute the carbon substrate throughout the plume. The implementation of this alternative would consist of two phases: floodplain cleanup and interior plume cleanup. Estimated time to clean up under Alternative C is from 10 to 60 years.

1.3.3 ALTERNATIVE D—SEQUENTIAL IN SITU TREATMENT

Under Alternative D, treatment of Cr(VI) would occur by injecting an organic carbon substrate throughout the plume to create geochemically reduced conditions to convert Cr(VI) to insoluble Cr(III). Since the reduced chromium would be deposited in the soil formation instead of groundwater, Cr(VI) would be removed from groundwater in a manner similar to Alternative C. Approximately 10 treatment zones consisting of lines of injection and extraction wells would be constructed and operated in phases to distribute an organic carbon substrate over the entire plume. Wells would be switched from extraction to injection as the implementation progress through different phases of treatment. Lines of wells would be constructed with piping and power to allow each line to be operated in either an injection or extraction mode. Water would be pumped from one line of wells and injected into the adjacent line of wells. Carbon substrate would be added to extracted water prior to injection. The carbon would be distributed throughout the aquifer in the area between the active injection and extraction well lines. Under Alternative D, up to 280 new wells could be installed, of which 200 would be remediation wells (including extraction, injection, and IRZ wells) and 80 would be monitoring wells. Of the 200 remediation wells, an estimated 70% would be upland remediation wells, 10% would be floodplain remediation wells, and 20% would be bedrock remediation wells (PG&E 2010, PG&E 2009:Table D-19B).

The floodplain would be treated in the initial phase by pumping from wells near the Colorado River and injecting into wells near National Trails Highway. Once carbon distribution is complete and Cr(VI) is below cleanup goals in the floodplain, the line of wells along National Trails Highway would be converted to extraction wells and injection would be moved to the adjacent line of wells west of National Trails Highway. This “leapfrog” pattern of moving the injection and extraction after each segment of the plume was treated would be repeated throughout all the lines of wells until the entire plume had been treated. Estimated time to clean up under Alternative D is from 10 to 20 years.

1.3.4 ALTERNATIVE F—PUMP AND TREAT

Alternative F would involve pumping groundwater, ex situ treatment in an aboveground treatment plant to remove chromium from the groundwater, and reinjection of the treated water back to the aquifer (known as pump and treat). The pump and treat process would include chemical reduction by addition of ferrous iron; oxidation, pH adjustment, and settling in a clarifier; and final filtration for a process that is essentially similar to the ex situ treatment processes at the current IM-3 Facility, with the exception that it would not include reverse osmosis, as it is assumed salinity removal would not be needed.

Alternative F would include a 1,280 gpm treatment plant to remove Cr(VI) from groundwater prior to injection into injection wells. The treatment plant would be considerably larger than the existing IM-3 Facility. For the purposes of this analysis, it is assumed the treatment plant would be 90,000 square feet and 45 feet high. An additional 100,000 square feet would be needed to accommodate parking and storage for equipment and materials. Location of the treatment plant would most likely be within the lower yard of the compressor station; however an alternate location could be the site of the current IM-3 treatment plant. The current IM-3 would be decommissioned and demolished under this alternative. In addition to the treatment plant, up to 120 new wells could be installed, of which 70 would be remediation wells (including extraction, injection and IRZ wells) and 50 would be monitoring wells. Of the 70 remediation wells, an estimated 60 %would be upland remediation wells and 40 % would be bedrock remediation wells. No floodplain remediation wells are proposed under this alternative (PG&E 2010, PG&E 2009:Table D-19B). Extraction wells would be placed in the plume and East Ravine area to extract groundwater. Extracted groundwater would be transported via piping to the treatment plant for treatment. Treated groundwater would be delivered to injection wells at approximately three locations to the west of the plume and three locations in the southern portion of the plume near the mountain front. Chromium removed from the groundwater via ex situ treatment would be collected in the sludge from the clarifier and filtration systems and would be transported off-site by truck to an appropriately licensed disposal facility. Estimated time to cleanup under Alternative F is from 15 to 150 years.

1.3.5 ALTERNATIVE G—COMBINED FLOODPLAIN IN SITU/PUMP AND TREAT

Alternative G would combine floodplain cleanup by in situ treatment with treatment of the upland portion of the plume by extraction and reinjection with ex situ treatment. The floodplain cleanup would involve construction of IRZ lines at National Trails Highway and between National Trails Highway and the Colorado River, as described in the initial phase of Alternative C. Chromium in the upland portions of the project area would be addressed by pumping groundwater, ex situ treatment to remove chromium from the groundwater, and reinjection of the treated water back to the aquifer.

Concurrent with the floodplain cleanup, treatment of the plume in the upland portions of the site would be by an ex situ process similar to the treatment processes at the current IM-3 treatment plant: chemical reduction by addition of ferrous iron; oxidation, pH adjustment, and settling in a clarifier; and final filtration. Alternative G would include a treatment plant of the same dimensions and at the same potential locations as defined under Alternative F. In addition, up to 200 new wells could be installed, of which 140 would be remediation wells (including extraction, injection and IRZ wells) and 60 would be monitoring wells. Of the 140 remediation wells, an estimated 30 %would be upland remediation wells, 50 % would be floodplain remediation wells, and 20 % would be bedrock remediation wells (PG&E 2010, PG&E 2009:Table D-19B). Extraction wells would be placed in the central portions of the plume and the East Ravine area to extract groundwater. Extracted groundwater would be transported via piping to a treatment plant for treatment and treated groundwater would be piped to injection wells. The assumed combined flow rate is approximately 1,230 gpm. Treated groundwater would be delivered to injection wells at approximately three locations to the west and north of the plume and three locations in the southern portion of the plume near the mountain front. Chromium removed from the groundwater via ex situ treatment would be collected in the sludge from the clarifier and filtration systems and would be transported off-site by truck to an appropriately licensed disposal facility. Estimated time to cleanup under Alternative G is from 10 to 90 years.

1.3.6 ALTERNATIVE H—COMBINED UPLAND IN SITU/PUMP AND TREAT

Alternative H would combine in situ treatment in the upland portions of the plume with pump-and-treat technology in the floodplain. While both Alternative G and Alternative H include a combination of in situ treatment and pump and treat, this alternative differs from Alternative G by relying on in situ to be the dominant feature of the cleanup rather than pump and treat. The upland in situ cleanup would involve construction of several IRZ lines across the length and width of the plume. Organic carbon would be injected in the IRZ lines to treat the existing Cr(VI) in the alluvial zone of the aquifer. IRZ lines would be constructed by recirculating between adjacent wells within each line or by use of vertical circulation wells.

The ex situ process would be similar to the treatment processes at the existing IM-3 Facility: chemical reduction by addition of ferrous iron; oxidation, pH adjustment, and settling in a clarifier; and final filtration. Following ex situ treatment, treated groundwater would be transported via pipeline to injection wells. Treated groundwater would be reinjected into injection wells at approximately four locations within and outside the plume boundary. Chromium removed from the groundwater via ex situ treatment would be collected in the sludge from the clarifier and filtration systems and would be transported off-site by truck to an appropriately licensed disposal facility. While Alternative H would include a treatment plant, it would be considerably smaller than that proposed for Alternatives F and G. The treatment plant under Alternative H would be a 200–300 gpm facility with a 120,000 square foot overall facility footprint, including the 55,000 square foot treatment facility. As with the other alternatives, the current IM-3 would be decommissioned and demolished.

In addition, up to 210 new wells could be installed under Alternative H, of which 140 would be remediation wells (including extraction, injection and IRZ wells) and 70 would be monitoring wells. Of the 140 remediation wells, an estimated 70 % would be upland remediation wells, 20% would be floodplain remediation wells, and 10% would be bedrock remediation wells (PG&E 2010, PG&E 2009:Table D-19B).

Under Alternative H, approximately one-half the extracted groundwater would be transported to the ex situ treatment process described above. The remaining approximately one-half of the extracted water being transported to the western edge of the plume, amended with carbon, and reinjected at approximately four locations near the western edge of the plume. The primary purpose of this reinjection is to increase the flushing efficiency by providing additional "push" to move the plume through the IRZ lines. Sufficient carbon would be added to this water to reduce the Cr(VI) in the injected water, thereby providing treatment of this water concurrent with reinjection. The flows would be balanced so that the treated water injection provides containment of all the flow lines emanating from the amended water injection wells, thus limiting the spread of the amended water and forcing it to flow back through the IRZ lines toward the extraction wells. Estimated time to cleanup under Alternative H is from 10 to 70 years.

1.3.7 ALTERNATIVE I—NO PROJECT ALTERNATIVE/CONTINUED OPERATION OF INTERIM MEASURE

As described in the Final CMS/FS, Alternative I would involve continued operation of the IM-3 Facility as the final remedial action at the site. The IM-3 system would operate with the existing equipment with existing procedures using the existing process at the existing flow rate until cleanup goals are attained. As a continuation of existing operations with no new remediation facilities, this alternative is considered as the No Project Alternative in this EIR.

1.4 SUMMARY OF KNOWN CONTROVERSIAL ISSUES

CEQA Guidelines require that the summary of an EIR include a synopsis of known issues of controversy that have been raised by agencies and the public (CEQA Guidelines, Section 15123). A notice of preparation (NOP) for the project was released on May 2, 2008 (Appendix NOP). The NOP and the scoping process are described in Chapter 2 of this EIR. Agency and public scoping meetings were held from May 27 to June 5, 2008, to receive oral comments on the scope and content of the EIR. The following is a summary of the most controversial issues that were received during the NOP comment period:

- **Issue:** Concerns regarding contamination in the project area and the types, duration, and effectiveness of cleanup methods being considered (i.e., whether the cleanup methods would be effective; how much time would be required to clean up the contamination; whether residual contamination would remain after cleanup activities are completed).

    - **Where Addressed in EIR:** The extent of groundwater contamination is described in detail in Sections 4.5, "Geology and Soils," 4.6, "Hazardous Materials," and 4.7, "Hydrology and Water Quality." The effectiveness of the remedy that has been selected as the proposed project that is analyzed in this EIR is described in detail in the Final CMS/FS that was prepared to evaluate the remedial alternatives and their effectiveness under RCRA and CERCLA. Chapter 8, "Alternatives to the Proposed Project," provides a summary of the elements of each of the alternatives as compared with the proposed project. The duration of the cleanup process is described in Chapter 3, "Project Description." The analysis of the indirect impacts related to hazardous materials associated with implementation of the proposed project is discussed in Section 4.7, "Hydrology and Water Quality."

- **Issue:** Potential impact to the environment of the investigation and cleanup process, particularly the impact to Native American cultural and archaeological resources in the immediate vicinity of the compressor station.

    - **Where Addressed in EIR:** The purpose of this EIR is to evaluate the potential environmental effects associated with implementation of the proposed project (the remediation efforts) to all environmental resources that could be affected. It considers the potential environmental impacts associated with construction, operation and maintenance, and decommissioning of the proposed project. In particular, this document includes Section 4.4, "Cultural Resources," which focuses on the evaluation of potential effects

to Native American cultural and archaeological resources. Table 4.4-2 includes a summary of specific comments that were received regarding cultural resource concerns. In addition, Chapter 8 provides a discussion of the potential impacts to cultural resources associated with each of the alternatives.

- **Issue:** Potential impact to human health from exposure to contaminants of concern in the project area, as a result of exposure either to contaminated surface water (i.e., the Colorado River) and/or contaminated ground water (via drinking water wells).

  - **Where Addressed in the EIR:** The extent of groundwater contamination is described in detail in Sections 4.5, "Geology and Soils," 4.6, "Hazardous Materials," and 4.7, "Hydrology and Water Quality." The effectiveness of the ongoing interim measure implemented at the compressor station and that of the proposed remedy that has been selected as the proposed project that is analyzed in this EIR are described in detail in the Final CMS/FS that was prepared to evaluate the remedial alternatives and their effectiveness.

- **Issue:** Range of environmental issues that should be addressed in the EIR (i.e., whether all of the appropriate cleanup methods will be properly/fully addressed in the EIR, as opposed to limiting the analysis of technologies to those that are less expensive or shorter in duration).

  - **Where Addressed in the EIR:** The purpose of this EIR is to evaluate the potential environmental effects associated with implementation of the proposed project as defined in the statement of basis to all environmental resources that could be affected. Section 1.6 provides a list of those issue areas that are analyzed in this EIR and Chapter 5.3 provides rationale for those few areas that were not evaluated in detail. It considers the potential environmental impacts associated with construction, operation, and decommissioning of the proposed project, and also provides a comparative analysis of the alternatives to the proposed project. The process of identifying remedial technologies is not the focus of this document. Detail regarding the available technologies and effectiveness of each is presented in the Final CMS/FS.

1.5 ISSUES TO BE RESOLVED

DTSC has prepared this EIR and corresponding statement of basis using the review of available technical information regarding potential alternatives to the remediation of the contaminated groundwater plume. As required by CEQA, DTSC must evaluate the material in this EIR, including the identified mitigation measures and potentially feasible alternatives, before deciding whether to approve the project or an alternative to the project. Aside from those basic decisions, at this time, there are no issues to be resolved regarding the selection of alternatives or regarding implementation of the proposed project.

DTSC acknowledges that the proposed project area is located within the Topock Cultural Area, which is considered a historical resource as defined at Section 15064.5 of the CEQA Guidelines. The nature of this resource, and the expressed interests and concerns of the Fort Mojave Indian Tribe and certain other Yuman-speaking peoples indicate that the remediation activities required under RCRA and CERCLA would create further impacts on this resource that cannot be mitigated to a less-than-significant level.

Investigation regarding the extent of soil contamination associated with current and historical operation at the compressor station is ongoing. Soil investigations that will determine the extent of contamination are likely to be completed in 2013. Following the completion of these investigations, remedial alternatives designed specifically for soil contamination will be prepared through a separate process and additional environmental review will be required. As explained elsewhere in Section 2.2.5, "Ongoing Evaluation of Soils Contamination," DTSC had initially planned for the soils remediation project to be considered simultaneously with the proposed groundwater remediation project evaluated in this EIR. The development of the two projects, however, could not be maintained on the same timeline because of technical and legal constraints on the development of data to support the need for and the design of soil remediation. DTSC determined that substantial delays in approving a groundwater

remediation project simply for administrative convenience of parallel evaluation was not justified and the two projects are now being evaluated on separate timelines.

The remedial alternatives evaluated for groundwater are anticipated to be different from the alternatives to be evaluated for soil. The RFI/RI Volume 3 and associated risk assessment will complete the evaluation of soils, and will provide conclusions about remedial objectives, if any, associated with any potential soil contamination that might migrate to groundwater. While this evaluation is not complete, it is not anticipated that this evaluation will redefine the objectives of the groundwater remedy. Thus, this DEIR does not consider future soil remediation activities as part of the proposed project; however, for the purposes of full disclosure soil remediation activities are considered a reasonably foreseeable future project and considered as part of the cumulative impacts analysis in Chapter 6 of this DEIR.

1.6 SUMMARY OF IMPACTS AND MITIGATION

Information in Table 1-2, "Summary of Impacts and Mitigation," has been organized to correspond with the environmental issues discussed in Chapter 4, "Approach to the Environmental Analysis."

1.7 SUMMARY OF CUMULATIVE IMPACTS

The extent of the geographic area that may be affected by implementation of the proposed project varies depending on the resource under consideration. As discussed in Chapter 6, "Cumulative Impacts," of this document, in addition to the proposed project, 22 other projects have been completed, are under construction, or are proposed for future development in the vicinity of the project. In addition, activities located in the project area related to the future investigation of soil contamination and remediation is considered in this chapter.

1.8 SUMMARY OF THE SETTLEMENT AGREEMENT REQUIREMENTS

Chapter 7 provides the analysis required by the stipulation and settlement agreement entered into on December 18, 2006, in *Fort Mojave Indian Tribe v. Department of Toxic Substances Control et al.* (Superior Court of the State of California, Sacramento County [Case No. 05CS00437]), referred to in this chapter as the "Settlement Agreement." Among other things, the Settlement Agreement requires that, if the proposed final remedy involves locating or retaining any equipment or installation on the IM-3 site, DTSC, in exercising its discretion regarding any such equipment or installation, is to evaluate significant environmental effects on cultural and biological resources on the site based on the environmental setting (e.g., conditions) at the site as of January 2004 (before development of the IM-3 Facility). Chapter 7 specifically considers the potentially significant environmental impacts on biological and cultural resources of locating or retaining any equipment or installation on the IM-3 site as part of the potential final remedies, consistent with the Settlement Agreement.

The project area for remediation facilities, monitoring wells, and infrastructure associated with the proposed project does include the location of the IM-3 site. The project facilities that could occur within the IM-3 site are limited to freshwater injection wells, injection wells for carbon-amended water, monitoring wells, and associated utility and pipeline trenches. In addition, as part of the proposed project, IM-3 would be decommissioned. More detail on the physical attributes of these facilities and the proposed construction and decommissioning activities is provided in Chapter 3.

Based on a review of the Settlement Agreement, relevant case law, and relevant sections of the CEQA statute and CEQA Guidelines, DTSC determined that the requirements of the Settlement Agreement should be addressed in a stand-alone chapter of the EIR (Chapter 7). This approach allows the environmental analysis provided in Chapter 4 to establish a consistent approach to the baseline generally required by CEQA, with Chapter 7 providing the additional information stipulated in the Settlement Agreement.

The analysis contained in Chapter 7 is at an equal level of detail when compared to the biology and cultural resource impact analyses contained in Chapter 4. The following is a summary of the conclusions of the analysis contained in Chapter 7.

1.8.1 BIOLOGICAL RESOURCES

Biological resource impacts and mitigation measures would remain unchanged when comparing the environmental analysis using a 2004 baseline (as reflected in Chapter 7) and a 2008 baseline (as reflected in Chapter 4). The extent of (e.g., acreage) of potential impacts on waters of the United States, wetlands, riparian habitats, and aquatic species and habitat would not differ because the construction of the IM-3 Facility did not affect these habitats. With regards to potential impacts to avian species, impacts and recommended mitigation measures would not differ between the 2004 and 2008 baseline. Under both, impacts on special-status bird species (e.g., crissal thrasher [*Toxostoma crissale*]) could occur. These potential impacts would not differ when comparing an analysis using a 2004 baseline to an analysis using the baseline at the time the NOP was issued (May 2008) because the construction of the IM-3 Facility did not affect these habitats. It should be noted that habitat for several of the bird species addressed in Chapter 4 are not present on the IM-3 site (i.e., southwestern willow flycatcher [*Empidonax traillii extimus*], and Yuma clapper rail [*Rallus longirostris yumanensis*]).

With regard to upland habitats and species, impacts on creosote scrub habitat could occur as a result of the installation of new wells and associated infrastructure, as well as the decommissioning of IM-3 (when considering the 2004 baseline, which assumes that the existing IM-3 is not present). Significant impacts to terrestrial species would not occur because of the minimal acreage affected in the upland habitat and its marginal quality. As with consideration under the May 2008 baseline, impacts on desert tortoise could occur because there is some evidence of historical use, although the quality of the present creosote scrub habitat is poor, typically lacking of annual vegetation for forage and burrows for shelter (CH2M Hill 2007a:5-11 through 5-12, included in Appendix BIO of this EIR). Decommissioning of the IM-3 Facility and loss of marginal desert tortoise habitat could occur but these impacts would be relatively minor (although the number of acres would be greater when considering a 2004 baseline as compared to a May 2008 baseline).

1.8.2 CULTURAL RESOURCES

With a January 2004 baseline, impacts and recommended mitigation measures would be very similar to those identified using the 2008 baseline. Sixty-four of the 155 archaeological resources (sites and isolated finds) identified in Section 4.4, “Cultural Resources,” are within the boundaries of the IM-3 site. The potential would remain for loss or damage of known cultural resources sites associated with construction and operations/maintenance activities. In addition, undiscovered cultural resources or Native American burials could be discovered. These resources would have the potential to be affected by any proposed project facilities within the IM-3 site, regardless of the date of the baseline.

Impacts to the historical resources, unique archaeological resources, paleontological resources, Native American burials, and the Topock Cultural Area, as well as the recommended mitigation measures for those impacts, would remain relatively unchanged. The impacts and mitigation measures (CUL-1a, CUL-1b, CUL-1c, CUL-2, and CUL-4) regarding potential loss or damage to historical resources and/or burials would remain applicable. In January 2004, a protective cap was placed on a portion of site CA-SBR-2910H as a mitigation measure for the IM-3 Facility to protect the site from project-related truck traffic. Presuming that the cap did not exist, additional measures would need to be implemented to protect site CA-SBR-2910H. These measures would involve either implementing mitigation similar to the cap, or rerouting site access and other project facilities to avoid sites that are eligible for the California Register of Historical Resources.

The effects of decommissioning under either baseline scenario would be similar to those of construction activities, with a potential for the loss or damage of known cultural resources sites near decommissioning activities. Information gathered as part of this EIR through the Native American Communication Plan and other sources

suggests that some tribal stakeholders would consider the decommissioning activities associated with the proposed project would create a temporary, adverse change to the Topock Cultural Area, but that ultimate removal of all proposed project facilities would serve to largely restore the sanctity of the area.

Table 1-2
Summary of Impacts and Mitigation

Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
4.1 Aesthetics			
Construction and decommissioning activities are dynamic and would have a limited effect on existing form, lines of sight, and textural pattern. Construction and decommissioning activities would be spread throughout the large project area and views of construction activity would be of short duration. From key views 1, 2, 4, 5, 9, 11 and 13 of the project area, the overall degree of contrast does not meet the threshold of significance for visual quality and character impacts	Less than Significant	No mitigation is required.	Less than Significant
From key views 4, 6, and 10, the overall degree of contrast does not meet the threshold of significance.	Less than Significant	No mitigation is required.	Less than Significant
Impact AES-1: Views from Topock Maze Locus B toward the floodplain, Colorado River and "Needles" rock formation, a Scenic Vista (represented by key view 5) could be adversely affected by the proposed project through removal of floodplain vegetation, introduction of reagent storage tanks and control building, grading operations, and overall alteration of the foreground elements of a scenic vista.	Potentially Significant	**Mitigation Measure AES-1:** The proposed project shall be designed and implemented to adhere to the design criteria presented below. ► Existing mature plant specimens shall be protected in place during construction, operation, and decommissioning phases. The identification of plant specimens that are determined to be mature and retained shall occur as part of the design phase and mapped/identified by a qualified plant ecologist or biologist and integrated into the final design and project implementation. ► Revegetation of disturbed areas within the riparian vegetation along the Colorado River shall occur concurrently with construction operations. Plans and specifications for revegetation shall be developed by a qualified plant ecologist or biologist before any riparian vegetation is disturbed. The revegetation plan shall include specification of maintenance and monitoring requirements, which shall be implemented for a period of 5 years after project construction or after the vegetation has successfully established, as determined by a qualified plant ecologist or biologist.	Less than Significant

Table 1-2 Summary of Impacts and Mitigation			
Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		► Plant material shall be consistent with surrounding native vegetation. ► The color of the wells, pipelines, reagent storage tanks, control structures, and utilities shall consist of muted, earth-tone colors that are consistent with the surrounding natural color palette. Matte finishes shall be used to prevent reflectivity along the view corridor. Integral color concrete should be used in place of standard gray concrete. ► The final revegetation plans and specifications shall be reviewed and approved by an architect, landscape architect, or allied design professional licensed in the State of California to ensure that the design objectives and criteria are being met. Planting associated with biological mitigation may contribute to, but may not fully satisfy, visual mitigation.	
From key views 1, 2, 10, and 13, the overall degree of contrast does not meet the threshold of significance.	Less than Significant	No mitigation is required.	Less than Significant
Impact AES-2: Views from the Colorado River, a scenic resources corridor (represented by key view 11) could be adversely affected by the proposed project through removal of floodplain vegetation, grading operations, and overall alteration of a scenic view corridor.	Potentially Significant	**Mitigation Measure AES-2:** The proposed project shall be designed and implemented to adhere to the design criteria presented below. ► A minimum setback requirement of 20 feet from the water (ordinary high water mark) shall be enforced, except with regard to any required river intake facilities, to prevent substantial vegetation removal along the riverbank. ► Existing mature plant specimens shall be protected in place during construction, operation, and decommissioning phases. The identification of plant specimens that are determined to be mature and retained shall occur as part of the design phase and mapped/identified by a qualified plant ecologist or biologist and integrated into the final design and project implementation.	Less than Significant

Table 1-2
Summary of Impacts and Mitigation

Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		► Revegetation of disturbed areas within the riparian vegetation along the Colorado River shall occur concurrently with construction operations. Plans and specifications for revegetation shall be developed by a qualified plant ecologist or biologist before any riparian vegetation is disturbed. The revegetation plan shall include specification of maintenance and monitoring requirements, which shall be implemented for a period of 5 years after project construction or after the vegetation has successfully established, as determined by a qualified plant ecologist or biologist. ► Plant material shall be consistent with surrounding native vegetation. ► The color of the wells, pipelines, and utilities shall consist of muted, earth-tone colors that are consistent with the surrounding natural color palette. Matte finishes shall be used to prevent reflectivity along the view corridor. Integral color concrete should be used in place of standard gray concrete. ► The final revegetation plans and specifications shall be reviewed and approved by an architect, landscape architect, or allied design professional licensed in the State of California to ensure that the design objectives and criteria are being met. Planting associated with biological mitigation may contribute to, but may not fully satisfy, visual mitigation.	
From key views 1, 2, 4, 5, 9, and 13 of the project area, the overall degree of contrast does not meet the threshold of significance for visual quality and character impacts.	Less than Significant	No mitigation is required.	Less than Significant
Impact AES-3: The visual quality and character along the Colorado River could be altered through the removal of floodplain vegetation and grading operations (key view 11).	Potentially Significant	**Mitigation Measure AES-3:** Mitigation Measure AES-1 shall be implemented. Implementation of Mitigation Measures AES-1 would reduce the overall change to the visual character of the view corridor along the Colorado River. Although the proposed project would still be visible, incorporating a facilities design that is aesthetically sensitive and preserving the vegetation would blend	Less than Significant

Table 1-2 Summary of Impacts and Mitigation			
Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		the proposed project into their visual setting within the floodplain and would reduce the overall contrast of the proposed project	
Views of lighting and nighttime construction activity would be of short duration and would not include features that would create glare.	Less than Significant	No mitigation is required.	Less than Significant
4.2 Air Quality			
Impact AIR-1: Construction of the proposed project would result in emissions that do not exceed MDAQMD's thresholds for ROG, NO_X , and $PM_{2.5}$, but that do exceed MDAQMD's threshold of significance for PM_{10} (82 lb/day).	Significant	**Mitigation Measure AIR-1:** PG&E shall implement the fugitive dust control measures below for any construction and/or demolition activities: ► Use periodic watering for short-term stabilization of disturbed surface area to minimize visible fugitive dust emissions during dust episodes. Use of a water truck to maintain moist disturbed surfaces and actively spread water during visible dusting episodes shall be considered sufficient; ► Cover loaded haul vehicles while operating on publicly maintained paved surfaces; ► Stabilize (using soil binders or establish vegetative cover) graded site surfaces upon completion of grading when subsequent development is delayed or expected to be delayed more than 30 days, except when such delay is caused by precipitation that dampens the disturbed surface sufficiently to eliminate visible fugitive dust emissions; ► Cleanup project-related track out or spills on publicly maintained paved surfaces within twenty-four hours; and ► Curtail nonessential earth-moving activity under high wind conditions (greater than 25 miles per hour) or develop a plan to control dust during high wind conditions. For purposes of this rule, a reduction in earth-moving activity when visible	Less than Significant

Table 1-2
Summary of Impacts and Mitigation

Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		dusting occurs from moist and dry surfaces due to wind erosion shall be considered sufficient to maintain compliance.	
To receive a permit, stationary sources must meet applicable standards. Mobile sources would be well below applicable standards. Therefore, mobile and stationary operation-related activities would not result in project-generated emissions of criteria pollutants and ozone precursors that exceed the applicable thresholds.	Less than Significant	No mitigation is required.	Less than Significant
At this time no ambient CO monitoring data is available for the project area, however it is expected that the 1-hour ppm of CO in the project area would be less than 3 ppm/1-hr, based on typical concentrations in outlying areas (SMAQMD 2004). The anticipated 1-hour and 8-hour CO concentrations would be less than CAAQS and NAAQS.	Less than Significant	No mitigation is required.	Less than Significant
The project construction period of approximately 3 years would be much less than the 70-year period used for risk determination, and the equipment would be located at distances greater than 1,000 feet from the sensitive receptors as recommended by MDAQMD for significance determination. This would be less than significant**.** During the permitting process MDAQMD would analyze such sources (e.g., by preparing a health risk assessment) based on their potential to emit TACs. If it is determined that the sources would emit TACs in excess of MDAQMD's applicable significance threshold, MACT or T-BACT would be implemented in order to reduce emissions. If the implementation of MACT or T-BACT would not reduce the risk below the applicable threshold, the MDAQMD would deny the operating permit.	Less than Significant	No mitigation is required.	Less than Significant
The proposed project would not introduce new, permanent odor-generating facilities close to existing or planned sensitive receptors. Short-term odors sources would be intermittent and would dissipate rapidly from the source.	Less than Significant	No mitigation is required.	Less than Significant

Table 1-2 Summary of Impacts and Mitigation			
Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
4.3 Biological Resources			
Impact BIO-1: Implementation of the proposed project could result in fill of wetlands and other waters of the United States under USACE and DFG jurisdiction, as well as potential disturbance or removal of riparian vegetation along the Colorado River.	Potentially Significant	**Mitigation Measure BIO-1:** Areas of sensitive habitat in the project area have been identified during project surveys. These areas include floodplain and riparian areas, wetlands, and waters of the United States. Habitats designated by DFG as sensitive, including desert washes and desert riparian, are also included. To the extent feasible, elements of the project shall be designed to avoid direct effects on these sensitive areas. During the design process and before ground disturbing activities, a qualified biologist shall coordinate with PG&E to ensure that the footprints of construction zones, drill pads, staging areas, and access routes are designed to avoid disturbance of sensitive habitats to the extent feasible. DTSC shall be responsible for enforcing compliance with design and all preconstruction measures. If during the design process it is shown that complete avoidance of habitats under USACE jurisdiction is not feasible, the Section 404 permitting process shall be completed, or the substantive equivalent per CERCLA Section 121(e)(1). In either event, the acreage of affected jurisdictional habitat shall be replaced and/or rehabilitated to ensure “no-net-loss.” Before any ground-disturbing project activities begin in areas that contain potentially jurisdictional wetlands, the wetland delineation findings shall be documented in a detailed report and submitted to USACE for verification as part of the formal Section 404 wetland delineation process and to DTSC. For all jurisdictional areas that cannot be avoided as described above, authorization for fill of wetlands and alteration of waters of the United States shall be secured from USACE through the Section 404 permitting process before project implementation. Habitat restoration, rehabilitation, and/or replacement shall be at a location and by feasible methods agreeable to USACE and consistent with applicable county and agency policies and codes. Minimization and compensation measures adopted through any applicable permitting processes shall be implemented.	Less than Significant

Table 1-2
Summary of Impacts and Mitigation

Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		Alternately, if USACE declines to assert jurisdiction because it determines that CERCLA Section 121(e)(1) applies, the substantive equivalent of the Section 404 permitting process shall be complied with by ensuring that the acreage of jurisdictional wetland affected is be replaced on a "no-net-loss" basis in accordance with the substantive provisions of USACE regulations. Habitat restoration, rehabilitation, and/or replacement shall be at a location and by feasible methods consistent with USACE methods, and consistent with the purpose and intent of applicable county and agency policies and codes. Minimization and compensation measures adopted through any applicable permitting processes shall be implemented. In any event, a report shall be submitted to DTSC to document compliance with these mandates. If during the design process it is shown that complete avoidance of habitats under DFG jurisdiction (such as changes to the natural flow and/or bed and bank of a waterway) is infeasible, a Section 1602 streambed alteration agreement shall be obtained from DFG and affected habitats shall be replaced and/or rehabilitated. If complete avoidance of identified riparian habitat is not feasible, the acreage of riparian habitat that would be removed shall be replaced or rehabilitated on a no-net-loss basis in accordance with DFG regulations and, if applicable, as specified in the streambed alteration agreement, if needed. Habitat restoration, rehabilitation, and/or replacement shall be at a location and by methods agreeable to DFG and consistent with the purpose and intent of applicable county policies and codes, as well as those policies outlined under the respective federal agency guidance documents. Minimization and compensation measures adopted through the permitting process shall also be implemented. Restoration of any disturbed areas shall include measures to achieve "no-net-loss" of habitat functions and values existing before project implementation. These measures shall be achieved by developing and implementing a habitat restoration plan submitted to DFG, BLM, and USFWS that is agreeable to these agencies, or, alternately, through the implementation of a habitat restoration plan consistent with the substantive policies of DFG, BLM, and USFWS. The plan shall include a revegetation seed mix or plantings design, a	

Table 1-2 Summary of Impacts and Mitigation			
Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		site grading concept plan, success criteria for restoration, a monitoring plan for achieving no net loss of habitat values and functions, and an adaptive management plan. Alternately, if DFG declines to assert jurisdiction because it determines that CERCLA Section 121(e)(1) applies, and during the design process it is shown that complete avoidance of habitats under DFG jurisdiction (such as changes to the natural flow and/or bed and bank of a waterway) is infeasible, the substantive mandates of a streambed alteration agreement shall be implemented, and affected habitats shall be replaced and/or rehabilitated. If complete avoidance of identified riparian habitat is not feasible, the acreage of riparian habitat that would be removed shall be replaced or rehabilitated on a "no-net-loss" basis in accordance with DFG regulations and, if applicable. Habitat restoration, rehabilitation, and/or replacement shall be at a location and by methods agreeable to DFG and consistent with the purpose and intent of applicable county policies and codes, as well as those policies outlined under the respective federal agency guidance documents. Minimization and compensation measures adopted through the permitting process shall also be implemented. Restoration of any disturbed areas shall include measures to achieve "no-net-loss" of habitat functions and values existing before project implementation. These measures shall be achieved by developing and implementing a habitat restoration plan developed consistent with the substantive policies of DFG, BLM and USFWS. The plan shall include a revegetation seed mix or plantings design, a site grading concept plan, success criteria for restoration, a monitoring plan for achieving no net loss of habitat values and functions, and an adaptive management plan.	
Impact BIO-2a: Implementation of the proposed project could affect avian and terrestrial species, specifically special-status birds and desert tortoise, either directly or through habitat modifications.	Potentially Significant for special-status birds	**Mitigation Measure BIO-2a:** To the extent feasible, the project implementation plans shall be designed to minimize removal of habitat for special-status birds. During the design process and before ground disturbing activities, a qualified biologist shall coordinate with PG&E to ensure that the footprints of project elements and construction zones, staging areas, and	Less than significant

Table 1-2
Summary of Impacts and Mitigation

Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		access routes are designed to avoid direct or indirect effects on habitat and nesting habitat for other special-status species, to the extent feasible. DTSC shall guarantee compliance with all preconstruction and construction phase avoidance measures identified during this process and included in any design plans. Vegetation removal and other activities shall be timed to avoid the nesting season for special-status bird species that may be present. The nesting cycle for most birds in this region spans March 15 through September 30. ***Preconstruction Measures*** Preconstruction breeding season surveys shall be conducted during the general nesting period, which encompasses the period from March 15 through September 30, if the final design of the project could result in disturbance or loss of active nests of special-status bird species. If vegetation removal or other disturbance related to project implementation is required during the nesting season, focused surveys for active nests of special-status birds shall be conducted before such activities begin. A qualified biologist shall conduct preconstruction surveys to identify active nests that could be affected. The appropriate area to be surveyed and the timing of the survey may vary depending on the activity and species that could be affected. For the Yuma clapper rail, the preconstruction surveys shall specifically identify habitat within 300 feet of construction areas, in accordance with substantive policies of USFWS. ***Construction Measures*** Before the initiation of project elements that could result in disturbance of active nests or nesting pairs of other special-status birds, a qualified biologist shall be consulted to identify appropriate measures to minimize adverse impacts during the construction phase of the project. If deemed appropriate for the final project design because of the potential for impacts, minimization measures will include focusing construction activities that must be conducted during the nesting season to less-sensitive periods in the nesting cycle, implementing buffers	

Table 1-2 Summary of Impacts and Mitigation			
Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		around active nests of special-status birds to the extent practical and feasible to limit visual and noise disturbance, conducting worker awareness training, and conducting biological monitoring (including noise monitoring to determine if construction noise at the edge of suitable nesting habitat is elevated above 60 dBA L_{eq} or ambient levels). An avoidance and minimization plan for special status bird species, as defined in Table 4.3-3 and those species protected under the federal Migratory Bird Treaty Act, including the Yuma clapper rail, shall be developed and implemented in consultation with USFWS, and agreed upon by DTSC. Avoidance and impact minimization measures, such as prohibiting construction near or in sensitive bird habitat, limiting construction during breeding seasons, and requiring an on-site biological monitor, shall be included in the design plan and implemented to the extent necessary to avoid significant impacts on sensitive bird species.	
Impact BIO-2b: Implementation of the proposed project could affect avian and terrestrial species, including the desert tortoise, either directly or through habitat modifications.	Potentially Significant for desert tortoise	**Mitigation Measure BIO-2b:** ***Preconstruction Measures*** In areas where impacts to potential desert tortoise habitat are unavoidable, measures outlined in the Programmatic Biological Agreement (PBA) and in the USFWS letter concurring with the PBA, shall be implemented, as described below. To the extent feasible, project construction shall be designed to minimize removal of habitat for the desert tortoise. Before any ground-disturbing project activities begin, a USFWS-authorized desert tortoise biologist shall identify potential desert tortoise habitat in areas that could be affected by the final project design. Through coordination with the authorized biologist, PG&E shall ensure that the footprints of project elements and construction zones, staging areas, and access routes are designed to avoid direct or indirect effects on potential desert tortoise habitat to the extent feasible. These measures include the presence of a USFWS-authorized desert tortoise biologist on-site who will examine work areas and vehicles for the presence of desert tortoises, and who will conduct preconstruction desert tortoise surveys in areas where unavoidable	Less than Significant

Table 1-2
Summary of Impacts and Mitigation

Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		impacts to tortoise habitat would occur. If feasible, the preconstruction desert tortoise surveys would coincide with one of the two peak periods of desert tortoise activity (i.e., if feasible, the surveys should be conducted in either the period from April through May, or from September through October). The preconstruction surveys shall be in full accordance with the substantive requirements of USFWS protocols. ***Construction Measures*** Before the initiation of project elements that could result in disturbance of desert tortoises or desert tortoise habitat, a USFWS-authorized desert tortoise biologist shall be consulted to identify appropriate measures to minimize adverse impacts. Minimization measures are likely to include micro-siting structures, pipelines, and access roads in previously disturbed areas or in areas with sparse scrub vegetation, conducting worker awareness training, and conducting biological monitoring.	
Impact BIO-2c: Implementation of the proposed project could affect avian and terrestrial species, specifically special-status birds and desert tortoise, either directly or through habitat modifications.	Potentially Significant for Disturbance of Special-Status Species and Loss of Habitat Caused by Decommissioning	**Mitigation Measure BIO-2c:** To avoid impacts on special-status species that may occur within the project area as a result of decommissioning activities, an avoidance and minimization plan shall be developed and implemented through consultation with DFG, BLM, and USFWS. These measures shall be based on surveys conducted prior to decommissioning, and during the breeding season (as previously defined in this EIR for each species or suite of species). Restoration of any disturbed areas shall include measures to achieve no net loss of habitat functions and values existing before project implementation. These measures shall be achieved by developing and implementing a habitat restoration plan submitted to DFG, BLM, and USFWS that is agreeable to these agencies. The plan shall include a revegetation seed mix or plantings design, a site grading concept plan, success criteria for restoration, a monitoring plan for achieving no net loss of habitat values and functions, and an adaptive management plan.	Less than Significant

Table 1-2 Summary of Impacts and Mitigation			
Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
Impact BIO-3: If selected as part of the final remedy, construction of the freshwater intake structure element of the proposed project could prevent fish from accessing spawning habitat or interfere with preferred habitat. In addition, operation of the water intake structure within the Colorado River could cause mortality to fish, including special-status species. Increased sedimentation and turbidity, the release of contaminants, and standing during construction activities could also adversely affect fish habitat and movement in the Colorado River.	Potentially Significant	**Mitigation Measure BIO-3a:** Hydrology & Water Quality Mitigation Measure HYDRO-1 shall be implemented in order to reduce water quality impacts related to erosion and pollutant runoff through implementation of BMPs. In addition, installing the cofferdam and dewatering a portion of the proposed intake structure site during fish screen construction may result in fish stranding. PG&E and its contractor shall coordinate with a qualified fisheries biologist to develop and implement a fish rescue plan. The fish rescue effort would be implemented during the dewatering of the area behind the cofferdam and would involve capturing those fish and returning them to suitable habitat within the river. The fish rescue plan shall identify and describe the following items: collection permits needed, fish capture zones, staffing, staging areas, fish collection and transport methods, species prioritization, resource agency contacts, fish handling protocols, fish relocation zones, site layout and progression of dewatering and fish rescue, and records and data. To ensure compliance, a fisheries biologist shall be present on-site during initial pumping (dewatering) activities and to oversee the fish rescue operation. **Mitigation Measure BIO-3b:** To restore, replace, or rehabilitate habitat impacted by the intake structure, PG&E shall implement the measures described below. Unless as provided below, PG&E shall confer with DFG regarding potential disturbance to fish habitat and shall obtain a streambed alteration agreement, pursuant to Section 1602 of the California Fish and Game Code, for construction work associated with intake structure construction; PG&E shall also confer with DFG pursuant to the CESA regarding potential impacts related to the loss of habitat or other operational impacts on state-listed fish species, respectively. PG&E shall comply with all requirements of the streambed alteration agreement and any CESA permits to protect fish or fish habitat or to restore, replace, or rehabilitate any important habitat on a “no-net-loss” basis. Alternatively, if DFG declines to assert jurisdiction because it determines that CERCLA Section 121(e)(1) applies, the project	Less than Significant

Table 1-2
Summary of Impacts and Mitigation

Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		proponent shall consult with DFG regarding potential disturbance to fish habitat and shall meet the substantive policies of a streambed alteration agreement and of the CESA for construction work associated with intake structure construction and operations. PG&E shall comply with all substantive requirements of the streambed alteration agreement and CESA to protect fish and fish habitat or to restore, replace, or rehabilitate any important habitat on a "no-net-loss" basis and to operate the facility in accordance with CESA to ensure no net loss of habitat function. Additionally, PG&E shall consult with USACE regarding the need to obtain permits under section 404 of the CWA and section 10 of the Rivers and Harbors Act. In conjunction with these permitting activities, the USACE must initiate consultation with USFWS under Section 7 of the Federal ESA regarding potential impacts of the proposed project on federally listed fish species due to the loss of habitat on federally listed fish species. PG&E shall implement any additional measures developed through the ESA Section 7 processes, or its equivalent, to ensure "no-net-loss" of habitat function. Alternatively, if USACE and/or USFWS decline to assert jurisdiction because it determines that CERCLA Section 121(e)(1) applies, PG&E shall confer with USFWS regarding potential disturbance to federally listed fish species and federally listed fish species habitat and shall meet the substantive mandates under Section 7 of the Federal ESA regarding potential impacts to fish or to habitat of federally listed fish species. PG&E shall implement any additional measures developed through that processes, including compliance with the substantive requirements of all of what would be permit conditions if not exempt pursuant to CERCLA, and to ensure "no-net-loss" of habitat function. Because the type and extent of habitat potentially affected is unknown, PG&E shall have an instream habitat typing survey conducted in the area potentially affected by the intake construction. Further, cooperation with USFWS and other fisheries biologists shall determine suitable and acceptable	

Table 1-2 Summary of Impacts and Mitigation			
Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		location(s) for the intake structure(s) to avoid the spawning habitat of special-status fish species. PG&E shall avoid habitat modifications, especially to habitat that is preferred by native fishes for spawning or rearing including side channels, cobble or gravel bars, and shallow backwaters. If these habitat types cannot be avoided, any disturbed habitat will be restored or replaced to achieve "no-net-loss" of habitat types and values as described above. **Mitigation Measure BIO-3c:** Both screened and unscreened diversions can entrain larval life stages of fish. For example, adverse effects to early life stages of fish could occur if diversions coincide with planktonic larval life stages that occur during summer months, a period of high entrainment vulnerability. Prior to operation of the intake structure, PG&E shall consult with USFWS and DFG to determine the most vulnerable time of the year for entrainment or impingement of razorback sucker and bonytail chub eggs or larvae. PG&E shall install a state-of-the-art positive-barrier fish screen that would minimize fish entrainment and impingement at the intake structure. The fish screen shall be designed in accordance with DFG and the National Marine Fisheries Service criteria, with specific consideration given to minimizing harm to fish eggs and other early life stages. To ensure that the fish screen operates as intended and reduce the risk of impacts, long-term monitoring of the operations and maintenance of the positive-barrier screen shall be conducted. Monitoring at the onset of diversions through the intake shall include approach velocity measurements immediately after the positive-barrier screen operations begin, with fine-tuning of velocity control baffles or other modifications as necessary, to achieve uniform velocities in conformance with the screen criteria established by regulatory agencies.	

Table 1-2
Summary of Impacts and Mitigation

Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
Implementation of the proposed project would not have substantial adverse effects on the viability of populations of species covered in the LCR MSCP, the effectiveness of the LCR MSCP's conservation strategy, and attainment of the goals and objectives of the LCR MSCP. Additionally, the project would not conflict with resource management goals of USFWS, BLM or DOI.	Less than Significant	No mitigation is required.	Less than Significant
Implementation of the proposed project would not substantially interfere 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.	Less than Significant	No mitigation is required	Less than Significant
4.4 Cultural Resources			
Impact CUL-1: Cause Substantial Adverse Change in the Significance of a Historical Resource as Defined in CEQA Guidelines Section 15064.5. Construction, operation and maintenance, and decommissioning activities of the proposed project could result in substantial adverse changes to historical resources in the project area, including the (1) Topock Cultural Area, (2) other historical resources listed in Table 4.4-3, (3) historical resources that have yet to be identified in unsurveyed areas, and (4) historical resources that could be identified during construction. Impacts could occur through ground disturbance and other project-related activities or through the introduction of out-of character visual or auditory intrusions to historical resources that gain their significance in part because historical associations or aesthetic values. This impact would be potentially significant.	Significant and Unavoidable for CUL-1a and Potentially Significant for CUL-1b and CUL-1c	**Mitigation Measure CUL-1a:** ► During selection of the final design and location for physical improvements, PG&E shall utilize previously disturbed areas for the placement of new physical improvements to the extent feasible, and shall use previously existing physical improvements, such as wells and other facilities, where appropriate. ► PG&E shall also consider the location of Loci A, B and C of the Topock Maze during the design of the physical improvements necessary for the proposed project and avoid direct impacts to the Topock Maze to the fullest extent feasible. ► Upon selection of the final design and location for physical improvements, PG&E shall consult with Native American Tribes that attach cultural significance to the Topock Maze and the Topock Cultural Area and develop a plan to ensure tribal access to and use of the project area for religious, spiritual or cultural purposes, to the extent PG&E has the authority to grant such access, consistent with existing laws,	Potentially Significant and Unavoidable

Table 1-2 Summary of Impacts and Mitigation			
Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		regulations and agreements governing property within the project area. The plan may specify that such access may not interfere with the project or create health and safety concerns. Due to health and safety concerns, PG&E may exclude the Topock Compressor Station and related facilities from the area for which tribal access and use may be provided. ► This mitigation measure shall be implemented in a manner that is consistent with mitigation required through the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process. ► Mitigation measures AES-1, AES-2, and NOISE-3 are also applicable to the Topock Cultural Area. Mitigation measures AES-1 and AES-2 would reduce impacts related to aesthetic qualities of the project area, including those views from the Topock Maze Locus B. Mitigation measure NOISE-3 would serve to reduce noise impacts that could be experienced within the Topock Cultural Area and notify tribal members of project activity that would generate new noise. **Mitigation Measure CUL-1b and CUL-1c:** The following actions will reduce the potential for impacts to identified historical resources (other than the Topock Cultural Area, which is separately addressed in CUL-1a) within the project area. To the extent feasible, these actions shall be implemented in a manner that is consistent with mitigation required through the federal CERCLA process. ► PG&E shall consider the locations of the identified historic resources described above during the design of the physical improvements necessary for the proposed project and avoid impacts to historical and archaeological resources to the extent feasible. DTSC shall review the plans for the final design of the project and compare such plans to the location of identified resources to assist in and enforce the avoidance	

Table 1-2
Summary of Impacts and Mitigation

Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		of identified resources to the extent feasible. ► Upon selection of the final design and location for physical improvements, PG&E shall retain a qualified cultural resources consultant to prepare a cultural resources study that assesses the potential for the construction, operations, or decommissioning of proposed improvements to result in significant impacts on identified historical resources described in Impact CUL-1b and CUL-1c. This will include cultural resources survey and evaluation of unsurveyed areas that could be affected by construction as determined by DTSC in consultation with PG&E and BLM. "Significant impacts" as used here means the potential for construction to demolish or materially alter in an adverse manner those physical characteristics of a resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the CRHR. DTSC shall review this study. ► If the study determines that the construction of physical improvements would result in significant impacts on identified historical resources described in Impact CUL-1b and CUL-1c, and avoidance of the resource is not feasible, PG&E shall prepare and DTSC shall review a treatment plan that identifies measures to reduce these impacts. The treatment plan shall identify which criteria for listing on the CRHR contribute to the affected resource's significance and which aspects of significance would be materially altered by construction, operations, or decommissioning. However, if avoidance is not feasible, the Plan shall provide for reasonable efforts to be made to permit the resource to be preserved in place or left in an undisturbed state. Methods of accomplishing this may include capping or covering the resource with a layer of soil. To the extent that resource cannot feasibly be preserved in place or not left in an undisturbed state, excavation as mitigation shall be restricted to those parts of resource that would be damaged or destroyed by the project. Excavation as mitigation shall not	

Table 1-2 Summary of Impacts and Mitigation			
Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		be required for a unique archaeological resource if the treatment plan determines that testing or studies already completed have adequately recovered the scientifically consequential information from and about the resource. The plan shall require communication and consultation with Native American tribes that attach cultural significance to the Topock Maze and the Topock Cultural Area with regard to their perspectives and wishes for the treatment of the resources. ► PG&E shall retain a qualified cultural resources consultant to observe ground-disturbing activities and shall invite the participation of Native American tribal monitors during those activities, including repairs necessary during operations and decommissioning activities, to ensure that identified historical resources are avoided, to the extent feasible, during actual construction. The cultural resources consultant shall provide training to construction personnel on the locations of identified resources, values associated with the identified resources, responsibility for reporting suspected historic resources, and procedures for suspension of work in the immediate vicinity of the discovery, and shall use exclusionary fencing, flagging, or other appropriate physical barriers to mark the boundaries of identified resources. The cultural resources consultant shall invite Native American tribes to participate in this training. ► PG&E shall retain a qualified cultural resources consultant and shall invite Native American tribal monitors to conduct yearly inspections (or less frequently if agreed upon) identified historical resources and unique archaeological resources to determine if they have been impacted by ongoing operations activity relative to their condition prior to the project. If deterioration caused by ongoing operations is detected, PG&E shall develop and implement a treatment plan to reduce or avoid further degradation.	

Table 1-2
Summary of Impacts and Mitigation

Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
Impact CUL-2: Cause a Substantial Adverse Change in the Significance of a Unique Archaeological Resource. Many of the cultural resources listed in Table 4.4-3 may meet the CEQA criteria for a unique archaeological resource. Construction, operation and maintenance, and decommissioning activities of the proposed project could result in substantial adverse changes to one or more unique archaeological resource in the project area through ground disturbance and other project-related activities. This impact would be potentially significant.	Potentially Significant	**Mitigation Measure CUL-2:** Cultural resources that qualify as unique archaeological sites in the project area would probably also meet one or more of the criteria for historical resources and would be subject to Mitigation Measures CUL-1b and CUL-1c. The following actions will further reduce the potential for impacts on unique archaeological resources. To the extent feasible, these actions shall be implemented in a manner that is consistent with mitigation required through the federal CERCLA process. ► PG&E shall consider the locations of the unique archeological resources described above during the design of the physical improvements necessary for the proposed project and avoid impacts to those resources to the extent feasible. DTSC shall review the plans for the final design of the project and compare such plans to the location of the resources to assist in and enforce the avoidance of identified resources to the extent feasible. ► Upon selection of the final design and location for physical improvements, PG&E shall retain a qualified cultural resources consultant to prepare a cultural resources study that assesses the potential for the construction, operations, or decommissioning of proposed improvements to result in significant impacts on unique archeological resources. "Significant impacts" as used here means the potential for construction to demolish or materially alter in an adverse manner those physical characteristics of a resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the CRHR. DTSC shall review this study to ensure avoidance has been implemented to the extent feasible. ► If the study determines that the construction of physical improvements would result in significant impacts on unique archeological resources, and avoidance of the resource is not feasible, PG&E shall prepare and DTSC shall review a treatment plan that identifies measures to reduce these	Potentially Significant

Table 1-2 Summary of Impacts and Mitigation			
Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		impacts. The treatment plan shall identify which criteria for listing on the CRHR contribute to the affected resource's significance and which aspects of significance would be materially altered by construction, operations, or decommissioning. However, if avoidance is not feasible, the Plan shall provide for reasonable efforts to be made to permit the resource to be preserved in place or left in an undisturbed state. Methods of accomplishing this may include capping or covering the resource with a layer of soil. To the extent that resource cannot feasibly be preserved in place or not left in an undisturbed state, excavation as mitigation shall be restricted to those parts of resource that would be damaged or destroyed by the project. Excavation as mitigation shall not be required for a unique archaeological resource if the treatment plan determines that testing or studies already completed have adequately recovered the scientifically consequential information from and about the resource. The plan shall require communication with Native American tribes that attach cultural significance to the Topock Cultural Area with regard to their perspectives and wishes for the treatment of the resources. ► PG&E shall retain a qualified cultural resources consultant and shall invite the participation of Native American tribal monitors to observe ground-disturbing activities and shall invite the participation of Native American tribal monitors, during those activities, including repairs necessary during operations and decommissioning activities, to ensure that identified unique archeological resources are avoided, to the extent feasible, during actual construction. The cultural resources consultant shall provide training to brief construction personnel on the locations of identified resources, values associated with the identified resources, responsibility for reporting suspected unique archeological resources, and procedures for suspension of work in the immediate vicinity of the discovery, and shall use exclusionary fencing, flagging, or other appropriate physical	

Table 1-2
Summary of Impacts and Mitigation

Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		barriers to mark the boundaries of identified resources. The cultural resources consultant shall invite Native American tribes to participate in this training. ► PG&E shall retain a qualified cultural resources consultant and shall invite Native American tribal monitors to periodically conduct yearly inspections (or less frequently if agreed upon) identified unique archeological resources to determine if they have been impacted by ongoing operations activity relative to their condition prior to the project. If deterioration caused by ongoing operations is detected, PG&E shall develop and implement a treatment plan to reduce or avoid further degradation.	
Impact CUL-3: Directly or Indirectly Destroy a Unique Paleontological Resource or Site or Unique Geologic Feature. The construction of wells (extraction, injection, and IRZ construction), water conveyance pipelines and other utility pathways, reductant storage facilities, and the grading of access roads throughout the project area may affect paleontological resources through ground disturbance activities. This impact would be potentially significant.	Potentially Significant	**Mitigation Measure CUL-3:** A paleontological investigation including a detailed survey of the project area by a qualified paleontologist, shall be conducted to refine the potential impacts to unique paleontological resources within the project area and determine whether preconstruction recovery of sensitive resources and/or construction monitoring would be warranted. If construction monitoring is determined to be warranted, ground-altering activity would be monitored by a qualified paleontologist to assess, document, and recover unique fossils. Monitoring shall include the inspection of exposed surfaces and microscopic examination of matrix in potential fossil bearing formations. In the event microfossils are discovered, the monitor shall collect matrix for processing. In the event paleontological resources are encountered during earthmoving activities, recovered specimens shall be prepared by the paleontologist to a point of identification and permanent preservation. The monitor shall be empowered to halt construction activity in the immediate vicinity of the encountered paleontological resources for a sufficient interval to allow recovery of significant unearthed fossil remains. Paleontological resources of scientific value shall be identified and curated into an established, accredited, professional museum repository in the region with permanent retrievable paleontological storage. To the extent feasible, this mitigation measure shall be	Less than Significant

Table 1-2 Summary of Impacts and Mitigation			
Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		implemented in a manner that is consistent with mitigation required through the federal CERCLA process.	
Impact CUL-4: Disturbance of Human Remains, Including Those Interred Outside of Formal Cemeteries. Ground-disturbing activities required for all project phases may disturb as-yet undiscovered human remains, including Native American burial remains (i.e., human remains and grave goods). This impact would be potentially significant.	Potentially Significant	**Mitigation Measure CUL-4:** Ground disturbance activities may disturb as-yet undiscovered human remains or Native American burials and associated grave goods. PG&E shall retain a qualified cultural resources consultant and invite designated Native American tribal monitor(s) to train construction personnel in the identification of human remains so that they may aid in the identification of such resources. In the unlikely event human remains are uncovered over the course of project construction, operation and maintenance, and/or decommissioning activities, the following procedures shall be followed to ensure compliance with all applicable state and federal laws: ► The construction contractor shall immediately suspend work within the vicinity of the discovery and determine if the remains discovered are human or nonhuman. This determination shall be made by a qualified archaeologist with skill in the identification of human osteological (bone) remains. ► The cultural resources monitor or construction contract shall protect discovered human remains and/or burial goods remaining in the ground from additional disturbance. ► The archaeologist or construction contractor shall contact the San Bernardino County Coroner and PG&E project personnel immediately. In Arizona, the archaeologist and construction contractor will follow Arizona laws and implementing regulations. Human remains found on federal land would require the notification of the BLM Havasu City field office and compliance with applicable federal laws and regulations, including the Native American Graves Protection and Repatriation Act. ► The San Bernardino County Coroner will make determine if the remains are of recent origin and if a investigation of the	Significant and Unavoidable

Table 1-2
Summary of Impacts and Mitigation

Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		cause of death is required (California Health and Safety Code Section 7050.5). If the coroner determines that the human remains are not Native American and not evidence of a crime, project personnel shall coordinate with a qualified archaeologist(s) to develop an appropriate treatment plan. This may include contacting the next-of-kin to solicit input on subsequent disposition of the remains. If there is no next-of-kin, or recommendations by the next-of-kin are considered unacceptable by the landowner, the landowner will reinter the remains with appropriate dignity in a location outside the project area and where they would be unlikely to be disturbed in the future. ► In the event that the San Bernardino County Coroner determines that the human remains are Native American and not evidence of a crime, project personnel shall contact the NAHC so that a most likely descendent (MLD) can be identified as required under California Public Resources Code Section 5097.98. ► The MLDs shall inspect the area in which the human remains were found and provide treatment recommendations to the landowner and project personnel in accordance with the provisions of California Public Resources Code Section 5097.98. The treatment may include reburial, scientific removal of the discovered human remains and relinquishment to the MLD, nondestructive analysis of human remains and/or other culturally appropriate treatment. If the MLD so requests, the landowner would reinter the remains with the appropriate dignity in a location outside the area of disturbance in a location unlikely to be disturbed in the future. ► To the extent feasible, this mitigation measure shall be implemented in a manner that is consistent with mitigation required through the federal CERCLA process.	

Table 1-2 Summary of Impacts and Mitigation			
Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
4.5 Geology and Soils			
The proposed project would not create risks to people from seismic hazards because the site is not located within an earthquake fault zone. Surface rupture is, therefore, not expected to occur on the project site, and the potential for seismic activity in the area is considered low.	Less than Significant	No mitigation is required.	Less than Significant
The project site is underlain by soils with a very low potential for shrink/swell and subsidence because of very low clay content. Furthermore, portions of the project area that are relatively flat would not be subject to the effects of landslides. Areas with abrupt elevation changes, such as along Bat Cave Wash, may be susceptible to localized rock falls, but not to widespread slope failure or landslides.	Less than Significant	No mitigation is required.	Less than Significant
Impact GEO-1a: The proposed project could result in ground-disturbing activities that could alter the natural drainage patterns and erosion rates of the area (erosion impact).	Potentially Significant	**Mitigation Measure GEO-1a:** a. A DTSC-approved grading and erosion control plan, prepared by a California Registered Civil Engineer, shall be completed prior to implementation of any grading in areas of the site where there is a potential for substantial erosion or loss of top soils. The plan shall outline specific procedures for controlling erosion or loss of topsoil during construction, operation and maintenance, and decommissioning. b. To ensure soils do not directly or indirectly discharge sediments into surface waters as a result of construction, operation and maintenance, or decommission activities, PG&E shall develop a SWPPP as discussed in mitigation measure HYDRO-1 of the "Hydrology and Water Quality" section of this EIR. The SWPPP shall identify best management practices (BMPs) that would be used to protect stormwater runoff and minimize erosion during construction. PG&E shall prepare plans to control erosion and sediment, prepare preliminary and final grading plans, and shall prepare plans to control urban runoff from the project site during construction, consistent with the substantive requirements of the San Bernardino County Building and Land Use Services	Less than Significant

Table 1-2
Summary of Impacts and Mitigation

Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		Department for erosion control. c. During road preparation activities, loose sediment shall be uniformly compacted consistent with the substantive San Bernardino County Building and Land Use Services Department requirements to aid in reducing wind erosion. Ongoing road maintenance including visual inspection to identify areas of erosion and performing localized road repair and regrading, installation and maintenance of erosion control features such as berms, silt fences, or straw wattles, and grading for road smoothness shall be performed as needed to reduce potential for erosion. d. Regarding the potential for contaminated soils to be eroded and contribute contamination into receiving waters, Mitigation Measures GEO-2 and HAZ-2 shall be implemented. Mitigation Measure GEO-2 provides the provisions for mitigating erosion through BMPs which shall be implemented. Mitigation Measure HAZ-2 provides the provisions for safe work practices and handling of contaminated soils as investigation derived wastes.	
Impact GEO-1b: The proposed project could result in ground-disturbing activities that could alter the natural drainage patterns and erosion rates of the area (drainage patterns impact).	Potentially Significant	**Mitigation Measure GEO-1b:** a. BMPs shall be implemented during construction, operation and maintenance, and decommissioning activities to minimize impacts on the affected areas. Such BMPs could include, but would not be limited to, the following: uniform compaction of roadways created for accessing the project area as per San Bernardino County Building and Land Use Services Department requirements, returning areas adversely affected by differential compaction to preexisting conditions when these areas are no longer needed, and continuing maintenance of access roads, wellhead areas, and the treatment facility areas. b. Work area footprints shall be minimized to the greatest extent	Less than Significant

Table 1-2 Summary of Impacts and Mitigation			
Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		feasible to limit the areas exposed to differential compaction. Where possible, existing unpaved access roads and staging/working areas shall be reused and maintained for different stages of the construction. New graded areas for staging or for access roads shall be compacted to a uniform specification, typically on the order of 90 to 95% compaction and consistent with substantive San Bernardino County Building and Land Use Services Department requirements to reduce differential compaction and subsequent erosion of site soils. c. After the completion of the operation and maintenance phase, the disturbed areas which result in increased potential for compaction shall be returned to their respective preexisting condition by regrading consistent with the preconstruction slopes as documented through surveys that may include topographic surveys or photo surveys. The areas will be returned to the surrounding natural surface topography and compacted consistent with unaltered areas near the access roads or staging areas in question. The habitat restoration plan outlined in mitigation measure BIO-1 shall include restoration of native vegetation or other erosion control measures where revegetation would be infeasible or inadequate, for purposes of soil stabilization and erosion control of the project area.	
4.6 Hazardous Materials			
Impact HAZ-1: Operation and maintenance of the proposed project could result in the potential release of chemicals during use or delivery of chemicals as a result of component failure (e.g., valve, flange, or pipe), tank failure, or human error (e.g., tank overfilling).	Potentially Significant	**Mitigation Measure HAZ-1a:** a. PG&E shall store, handle, and transport hazardous material in compliance with applicable local, state, and federal laws. b. All chemical storage and loading areas shall be equipped with proper containment and spill response equipment. BMPs to be implemented may include, but are not limited to, use of secondary containment in mixing and storage areas; availability of spill kits and spill containment booms, and appropriate storage containers for containment of the materials generated	Less than Significant

Table 1-2
Summary of Impacts and Mitigation

Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		during the spill response. c. A project-specific HMBP, chemical standard operating procedure (SOP) protocols and contingency plans shall be developed to ensure that proper response procedures would be implemented in the event of spills or releases. Specifically, the HMBP and SOPs shall describe the procedures for properly storing and handling fuel on-site, the required equipment and procedures for spill containment, required personal protective equipment (PPE), and the measures to be used to reduce the likelihood of releases or spills during fueling or vehicle maintenance activities. BMPs to be implemented may include, but are not limited to, use of secondary containment in mixing and storage areas; availability of spill kits and spill containment booms, and appropriate storage containers for containment of the materials generated during the spill response. The field manager in charge of operations and maintenance activities shall be responsible for ensuring that these procedures are followed at all times. **Mitigation Measure HAZ-1b:** a. Fueling areas and maintenance areas would be supplied with proper secondary containment and spill response equipment. b. PG&E shall develop fueling SOP protocols and a contingency plan that would be implemented at all fueling areas on site. The SOPs shall describe the procedures for properly storing and handling fuel on-site, the required equipment and procedures for spill containment, required PPE, and the measures to be used to reduce the likelihood of releases or spills during fueling or vehicle maintenance activities. Potential measures include but are not limited to, fuel storage in bermed areas, performing vehicle maintenance in paved and bermed areas, and availability of spill kits for containment and cleanup of petroleum releases. The field manager in charge of construction and decommissioning activities shall be responsible for ensuring that these	

Table 1-2 Summary of Impacts and Mitigation			
Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		procedures are followed at all times. c. PG&E shall comply with local, state, and federal regulations related to the bulk storage and management of fuels.	
Impact HAZ-2: Construction, operation and maintenance, and decommissioning activities associated with the proposed project could result in the generation of dust and the exposure of construction workers to airborne contaminants [e.g., Cr(VI), total petroleum hydrocarbons, volatile organic carbons, semivolatile organic carbons] determined to be in the soil of the project site or that further investigation may determine to be in the soil	Potentially Significant	**Mitigation Measure HAZ-2:** Before initiating ground-disturbing operations, a health and safety plan shall be developed and implemented by qualified environmental professionals to ensure health and safety precautions are being met. It is not possible to prepare the health and safety plan at this stage of the planning process because final construction plans and other design documents have not been finalized in sufficient detail. However, at a minimum, the health and safety plan shall include procedures to mitigate potential hazards, and such procedures shall include the use of PPE, measures that provide protection from physical hazards, measures that provide protection from chemical hazards that may be present at the site, decontamination procedures, and worker and health and safety monitoring criteria to be implemented during construction. The worker health and safety plan shall include protective measures and PPE that are specific to the conditions of concern and meet the requirements of the U.S. Occupational Safety and Health Administration's (OSHA's) construction safety requirements and Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120). In accordance with OSHA requirements, appropriate training and recordkeeping shall also be a part of the health and safety program. The worker health and safety plan shall be certified by a Certified Industrial Hygienist in accordance with OSHA regulations. The worker health and safety plan shall be explained to the construction workers and all workers shall be required to sign the plan, which will be kept on the construction site at all times. Worker safety training shall occur prior to initiation of ground disturbing activities. Training shall include the review of all health and safety measures and procedures. All workers and engineering inspectors at the site shall provide written acknowledgement that the soils management plan (discussed below), worker health and	Less than Significant

Table 1-2
Summary of Impacts and Mitigation

Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		safety plan, and community health and safety plan were reviewed and training was received prior to commencement of construction activities. The following are specific elements and directives that shall be included in the health and safety plan and implemented by PG&E during construction, operation and maintenance, and decommissioning of this project: a. Vehicles traveling on unpaved roadways or surfaces would be directed to avoid traveling in areas where contaminated soils are known to be present; vehicle speeds shall be controlled (e.g., limited to 15 mph or slower) to limit generation of dust; measures, such as wetting of surfaces, will be employed to prevent dust generation by vehicular traffic or other dust-generating work activities. b. Premobilization planning shall occur during which the likelihood of encountering contaminated soils shall be reviewed along with the HMBP, site-specific health and safety plan, and SOPs so that the procedures are followed and the contingencies for handling contaminated soils are in-place prior to implementing the field operations. c. Should evidence of contaminated soil be identified during ground disturbing activities (e.g., noxious odors, discolored soil), work in this area will immediately cease until soil samples can be collected and analyzed for the presence of contaminants by the site supervisor or the site safety officer. Contaminated soil shall be managed and disposed of in accordance with a project-specific health and safety plan and soil management plan. The health and safety plan and soil management plan shall be approved by DTSC before beginning any ground disturbing activities. While the project is exempt from the requirements of the San Bernardino County Division of Environmental Health, the health and safety plan and soil management plan shall be prepared in	

Table 1-2 Summary of Impacts and Mitigation			
Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		general accordance with the substantive requirements of this agency. d. In the event that drilling sites must be located within areas of suspected soil contamination, the appropriate PPE shall be worn by all personnel working in these areas and methods specified in the health and safety plan used to control the generation of dust. When working in these areas, personnel shall be required to follow all guidance presented in the site-specific health and safety plan and soil management plan. The site-specific health and safety plan shall include provisions for site control such as, but not limited to, delineation of the exclusion, contaminant reduction and support zones for each work area, decontamination procedures, and procedures for the handling of contaminated soils and other investigation derived wastes. Soil that is excavated shall be loaded directly into containers such as roll-off bins; dust suppression methods shall be used prior to and during loading of soils into the bins. Suspected contaminated soils shall be segregated from suspected uncontaminated soils. e. Personnel working at the site shall be trained in Hazardous Waste Operations. f. All soil excavated and placed in roll-off bins or trucks for transportation off-site shall be covered with a tarp or rigid closure before transporting, and personnel working in the area shall be positioned upwind of the loading location.	
4.7 Hydrology and Water Quality			
Impact HYDRO-1: Construction, operation and maintenance, and decommissioning activities associated with the proposed project could result in (i) the exceedance of water quality standards as a result of increased runoff from impervious surfaces and (ii) exceedance of water quality standards due to potential exposure of runoff to	Potentially Significant	**Mitigation Measure HYDRO-1:** The project shall implement BMPs to meet the substantive criteria of all applicable federal, state, and local permit and regulatory requirements, even if a permit is not required pursuant to CERCLA, for purposes of ensuring the protection of receiving water quality. As such, a BMP plan shall be prepared and implemented for the project prior to construction and	Less than Significant

Table 1-2
Summary of Impacts and Mitigation

Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
significant materials stored, handled, and transported at the site. This would be a **potentially significant** impact.		decommissioning phase activities. Impacts on water quality from pollutants, including soils from erosion, shall be controlled through use of the following types of BMPs, which shall be incorporated into the appropriate project-specific BMP plan. BMP designations are based on those used by the *California Department of Transportation Storm Water Quality Handbooks, Construction Site BMPs Manual* (Caltrans 2000) and the *California Stormwater Quality Association Construction BMP Handbook* (California Stormwater Quality Association 2004): ► Scheduling (SS-1): Proper scheduling assists in identifying ways to minimize disturbed areas, which allows for a reduction in the active project area requiring protection and also minimizes the length of time disturbed soils are exposed to erosive processes. ► Preservation of Existing Vegetation (SS-2): Preserving existing vegetation to the maximum extent practicable facilitates protection of surfaces from erosion and can also help to control sediments. Sensitive areas should also be clearly identified and protected. ► Hydraulic Mulch (SS-3), Straw Mulch (SS-6), and Wood Mulching (SS-8): Using various mulches is a method for temporarily stabilizing soil and can be used on surfaces with little or no slope. ► Geotextiles, Plastic Covers, and Erosion Control Blankets/Mats (SS-7): These erosion control methods can be used on flat or, usually, sloped surfaces, channels, and stockpiles. ► Stabilized Construction Entrance/Exit (TC-1): A graveled area or pad located at points where vehicles enter and leave a construction site can be built. This BMP provides a buffer area where vehicles can drop their mud and sediment to avoid transporting it onto public roads, to control erosion from surface runoff, and to help control dust.	

Table 1-2 Summary of Impacts and Mitigation			
Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		► Runoff Control Measures (SS-9, SS-10, and SC-10): These include graded surfaces to redirect sheet flow, diversion dikes or berms that force sheet flow around a protected area, and stormwater conveyances (swales, channels, gutters, drains, sewers) that intercept, collect, and redirect runoff. Diversions can be either temporary or permanent. Temporary diversions include excavation of a channel along with placement of the spoil in a dike on the downgradient side of the channel, and placement of gravel in a ridge below an excavated swale. Permanent diversions are used to divide a site into specific drainage areas, should be sized to capture and carry a specific magnitude of storm event, and should be constructed of more permanent materials. A water bar is a specific kind of runoff diversion that is constructed diagonally at intervals across a linear sloping surface such as a road or right-of-way that is subject to erosion. Water bars are meant to interrupt accumulation of erosive volumes of water through their periodic placement down the slope, and divert the resulting segments of flow into adjacent undisturbed areas for dissipation. ► Silt Fence (SC-1): A temporary sediment barrier consisting of fabric is designed to retain sediment from small disturbed areas by reducing the velocity of sheet flows. ► Gravel Bag Berm (SC-6) and Sand/Gravel Bag Barrier (SC-8): A temporary sediment barrier consisting of gravel-filled fabric bags is designed to retain sediment from small disturbed areas by reducing the velocity of sheet flows. ► Desilting Basin (SC-2) and Sediment Trap (SC-3): Constructing temporary detention structures facilitates the removal of sediment from waters. The devices provide time for sediment particles to settle out of the water before runoff is discharged. Secondary concerns include potential pollutants from inappropriate material storage and handling procedures and nonstormwater discharges. These will be addressed through the following types of BMPs, which shall be incorporated into the stormwater BMP plan:	

Table 1-2
Summary of Impacts and Mitigation

Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		► Material Delivery and Storage (WM-1): Provide covered storage for materials, especially toxic or hazardous materials, to prevent exposure to stormwater. Store and transfer toxic or hazardous materials on impervious surfaces that will provide secondary containment for spills. Park vehicles and equipment used for material delivery and storage, as well as contractor vehicles, in designated areas. ► Spill Prevention and Control (WM-4): Ensure that spills and releases of materials are cleaned up immediately and thoroughly. Ensure that appropriate spill response equipment, preferably spill kits preloaded with absorbents in an overpack drum, is provided at convenient locations throughout the site. Spent absorbent material must be managed and disposed of in accordance with applicable regulations. In particular, absorbents used to clean up spills of hazardous materials or waste must be managed as hazardous waste unless characterized as nonhazardous. ► Solid Waste Management (WM-5): Provide a sufficient number of conveniently located trash and scrap receptacles to promote proper disposal of solid wastes. Ensure that the receptacles are provided with lids or covers to prevent windblown litter. ► Hazardous Waste Management (WM-6): Provide a sufficient number of proper receptacles to promote proper disposal of hazardous wastes. ► Concrete Waste Management (WM-8): Dispose of excess concrete in specific concrete washout facilities. ► Sanitary/Septic Waste Management (WM-9): Locate sanitary and septic waste facilities away from drainage courses and traffic areas. Maintain the facilities regularly. ► Vehicle and Equipment Cleaning (NS-8): Clean vehicles and	

Table 1-2 Summary of Impacts and Mitigation			
Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		equipment that regularly enter and leave the construction site. ► Vehicle and Equipment Fueling (NS-9): Fuel vehicles and equipment off-site whenever possible. If off-site fueling is not practical, establish a designated on-site fueling area with proper containment and spill cleanup materials. ► Vehicle and Equipment Maintenance (NS-10): Use off-site maintenance facilities whenever possible. Any on-site maintenance areas must be protected from stormwater runoff and on-site flooding. In addition to BMPs implemented to avoid or reduce impacts from the construction and decommissioning phases, BMPs shall also be implemented to avoid or reduce impacts from the operations and maintenance phases. To address potential violation of water quality standards caused by insufficient treatment, system failure at concentrations in excess of water quality standards, proper design shall include contingency measures such as safeguards to shut down the extraction wells in case of pipeline failure or malfunction. In addition, operation of the proposed project will be governed by and follow an operations and maintenance plan. PG&E will comply with all applicable water quality standards and any SWRCB or RWQCB resolutions identified as ARAR, as well as a corrective action monitoring program. Under the corrective action monitoring program, data will be collected to measure performance of the remedy, compliance with standards, and progress of the remedial action as a part of the project description. In addition, the project will be operated to continually assess performance issues and to modify the type, method, and configuration of the treatment delivery systems to enhance performance of the remedy to attain the cleanup goals and to respond to site conditions and performance issues as described in the project description. A SWPPP will also be prepared for the proposed project, which	

Table 1-2
Summary of Impacts and Mitigation

Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		will contain BMPs related to industrial activities (industrial SWPPP). The BMPs are designed to reduce pollutants in discharges that may affect receiving water quality during operations and maintenance of the proposed project. As noted above, BMP designations are based on those used by the *California Stormwater Quality Association Construction BMP Handbook* (California Stormwater Quality Association 2004). The SWPPP will incorporate BMPs such as the following: ► Good Housekeeping: Maintain facility in a clean manner and train facility personnel to contribute to a safe, clean, and orderly environment by properly disposing of trash in designated containers, storing materials in appropriate locations, and keeping equipment clean and in good working condition. ► Preventative Maintenance: Prevent or minimize release of pollutants. Develop Standard Operating Procedures for operation and maintenance of facility components and train employees to follow the procedures. ► Non-Stormwater Discharges (SC-10): Ensure that used oil, used antifreeze, and hazardous chemical recycling programs are being implemented. Conduct regular inspections of high priority areas. ► Spill Prevention, Control, and Cleanup (SC-11): Store materials properly to prevent spills from entering the storm drain system or surface waters. Ensure that spill cleanup materials are located on-site and are easily accessible. Clean up leaks and spills immediately using proper absorbent materials. Absorbents used to clean up hazardous materials must be disposed of as hazardous waste. Educate employees about spill prevention and cleanup. ► Vehicle and Equipment Fueling (SC-20): Maintain clean fuel-dispensing areas using dry cleanup methods, such as sweeping or using rags and absorbents for leaks and spills. Cover the	

Table 1-2 Summary of Impacts and Mitigation			
Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		fueling area to prevent contact with stormwater. Train personnel in pollution prevention, focusing on containment of spills and leaks. ► Outdoor Loading/Unloading (SC-30): Load and unload chemicals during dry weather, if possible, and load and unload in designated areas. Check equipment regularly for leaks. ► Outdoor Liquid Container Storage (SC-31): Cover the storage area with a roof and provide secondary containment. Inspect storage areas regularly for leaks or spills. ► Outdoor Equipment Operations (SC-32): Perform activities during dry weather, cover the work area with a roof, and use secondary containment. Train employees in proper techniques for spill containment and cleanup. ► Waste Handling and Disposal (SC-34): Cover storage containers with leak-proof lids, check for leaks weekly, and clean storage areas regularly. Ensure that wastes are disposed of properly. ► Tank Design System: Ensure that tank systems have sufficient strength to avoid collapse, rupture, or failure and that they are protected against physical damage and excessive stress. Provide adequate secondary containment. In conformance with the substantive requirements of General Industrial Permit (Order No. 97-03-DWQ), a monitoring and reporting program will be implemented to assess the effectiveness of BMPs and to modify BMPs and revise the SWPPP, if necessary, to continue to reduce pollutants and impacts on receiving waters. The monitoring program shall include the following minimum elements: ► sampling and analysis of the first stormwater event of the wet season (October 1 through May 30),	

Table 1-2
Summary of Impacts and Mitigation

Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		► sampling and analysis of a second stormwater event during the wet season, ► quarterly visual observations, ► monthly visual observations of storm-event discharges during the wet season, and ► annual evaluation for site compliance. Results of this monitoring shall be reported annually to DTSC. The annual report shall also report noncompliance, if applicable, with either the SWPPP or substantive general permit requirements and shall include a plan to prevent recurrence of the noncompliance. The implementation of stormwater plans shall include an education component to train workers on water quality concerns and proper BMP implementation, maintenance, and repair, in addition to stormwater management program training on the construction BMP plan and industrial SWPPP.	
Impact HYDRO-2: The proposed project would require the construction of impervious surfaces that could result in increased flows from individual project sites within the project area that could result in an increase of erosion and siltation on the project site and off-site.	Potentially Significant	**Mitigation Measure HYDRO-2:** Implement Mitigation Measure HYDRO-1. Implementation of appropriate BMPs defined in Mitigation Measure HYDRO-1 would minimize impacts on water quality by controlling erosion and siltation.	Less than Significant
Impact HYDRO-3: The proposed project does not include discharge to an existing or planned stormwater drainage system. The project does have the potential to contribute substantial additional sources of polluted runoff if materials and operations are not properly handled.	Potentially Significant	**Mitigation Measure HYDRO-3:** Implement Mitigation Measure HYDRO-1. Mitigation Measure HYDRO-1 shall be implemented. Implementation of appropriate BMPs defined in Mitigation Measure HYDRO-1 would minimize impacts on water quality by controlling potential pollutants, including sediment, and runoff discharges from the project area.	Less than Significant
4.8 Land Use and Planning			
The proposed project would not physically divide residential communities in the project area. Pipelines associated with the proposed project would be located underground or along existing pipelines.	Less than Significant	No mitigation is required.	Less than Significant

Table 1-2 Summary of Impacts and Mitigation			
Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
As summarized in Table 4.8-1, the proposed project would be consistent with relevant land use regulations and would not result in significant conflicts with land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect. Although some features of the project may be perceived as conflicting with the overall purpose of the County's Open Space and Resource Conservation land use designations, the proposed project is construction of necessary facilities for purposes of remediation, and would be decommissioned following project completion. No changes to designated land uses or zoning designations are required for project approval.	Less than Significant	No mitigation is required.	Less than Significant
4.9 Noise			
Operation of the proposed project would not result in any nontransportation noise sources (i.e., water filtration facilities) that would generate noise levels that would result in a noticeable, permanent increase in ambient noise levels at nearby sensitive receptors.	Less than Significant	No mitigation is required.	Less than Significant
The proposed project would not result in a substantial permanent increase in ambient noise levels relative to existing sensitive receptors in the project area above levels existing without the project or expose persons to or generate noise levels in excess of applicable standards.	Less than Significant	No mitigation is required.	Less than Significant
Impact NOISE-1: Implementation of the proposed project would result in the exposure of sensitive receptors to groundborne noise and vibration levels that exceed the applicable standards of the San Bernardino County Development Code (83.01.090) and the Mohave County Zoning Ordinance (Table 4.9-9). These groundborne noise and vibration levels could result in annoyance or architectural/structural damage.	Potentially Significant	**Mitigation Measure NOISE-1:** ► Construct new wells a minimum of 45 feet from vibration-sensitive receptors. Avoid constructing wells within 30 feet of vibration-sensitive land uses located in California and 275 feet of vibration-sensitive land uses located in Arizona; ► A disturbance coordinator will be designated by the project applicant, which will post contact information in a conspicuous location near the entrance so that it is clearly visible to nearby receivers most likely to be disturbed. The coordinator will manage complaints resulting from the construction vibration. Reoccurring disturbances will be	Less than Significant

Table 1-2
Summary of Impacts and Mitigation

Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		evaluated by a qualified acoustical consultant retained by the project applicant to ensure compliance with applicable standards. The disturbance coordinator will contact nearby vibration-sensitive receptors, advising them of the construction schedule.	
Impact NOISE-2: Implementation of the proposed project would result in intermittent construction activities associated with the installation of new wells, roadways, water conveyance, utilities, roadways, water filtration facilities, operations, and maintenance. These construction activities could potentially expose sensitive receptors to noise levels in excess of the applicable noise standards and/or result in a substantial increase in ambient noise levels.	Potentially Significant	**Mitigation Measure NOISE-2:** ► Construction equipment shall be properly maintained per manufacturer specifications and fitted with the best available noise suppression devices (e.g., mufflers, silencers, wraps). All impact tools shall be shrouded or shielded, and all intake and exhaust ports on power equipment shall be muffled or shielded. ► Construction equipment shall not idle for extended periods of time (more than 15 minutes) when not being utilized during construction activities. ► Construction activities shall include the use of berms, stockpiles, dumpsters, and or bins to shield the nearest noise-sensitive receptor adjacent to construction activities to within acceptable nontransportation noise level standards. When construction activities are conducted within the distances outlined above (i.e., 1,850 feet and 5,830 feet from California receptors and 330 feet and 735 feet from Arizona receptors for daytime and nighttime noise, respectively) relative to noise-sensitive uses in the project area, noise measurements shall be conducted by a qualified acoustical consultant at the nearest noise-sensitive land use relative to the construction activities with a sound level meter that meets the standards of the American National Standards Institute (ANSI Section S14 1979, Type 1 of Type 2) to ensure that construction noise associated with the project component complies with applicable daytime and nighttime noise standards. If noise levels are still determined to exceed noise standards, temporary barriers shall be erected as close to the construction activities as feasible, breaking the line of sight between the source and receptor where noise levels exceed applicable	Less than Significant

Table 1-2 Summary of Impacts and Mitigation			
Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		standards. All acoustical barriers shall be constructed with material having a minimum surface weight of 2 pounds per square foot or greater and a demonstrated Sound Transmission Class (STC) rating of 25 or greater as defined by the American Society for Testing and Materials' Test Method E90. Placement, orientation, size, and density of acoustical barriers shall be specified by a qualified acoustical consultant. ► A disturbance coordinator will be designated by the project applicant, which will post contact information in a conspicuous location near construction areas so that it is clearly visible to nearby receivers most likely to be disturbed. In addition, mailing of the same information will be sent to nearby receptors and all tribes. The coordinator will manage complaints resulting from the construction noise. Reoccurring disturbances will be evaluated by a qualified acoustical consultant retained by the project applicant to ensure compliance with applicable standards. The disturbance coordinator will contact nearby noise-sensitive receptors, advising them of the construction schedule.	
Impact NOISE-3: Implementation of the proposed project could result in future noise (construction, operations and maintenance, and decommissioning activities) that could result in conflicts with land use compatibility that exceed the County's standards for Places of Worship or conflict with Native American values associated with the Topock Cultural Area	Potentially Significant	**Mitigation Measure NOISE-3:** Provided that the proposed project would be required to achieve the normally acceptable exterior noise level standard for places of worship, the following mitigation measure shall be incorporated in the project design: ► Implement all of the mitigation measures outlined for Impact NOISE-1 and Impact NOISE-2; ► Upon completion of detailed project design, the determination of remediation activities and the schedule established to achieve these activities shall be communicated to Native American tribes. PG&E shall maintain a liaison with requesting Tribes to alert them to project activities that would generate new noise in the Topock Cultural Area on at least an	Potentially Significant and Unavoidable

Table 1-2
Summary of Impacts and Mitigation

Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		annual basis.	
4.10 Transportation			
The proposed project would generate additional traffic during construction, operation and maintenance, and decommissioning of the proposed project, however, it would not degrade LOS of roadway segments. Because the study facilities all currently operate at an acceptable level and the proposed project would not add traffic to a roadway segment that is operating at unacceptable levels, this impact would be less than significant.	Less than Significant	No mitigation is required.	Less than Significant
The existing cross-section of Park Moabi Road does not meet current county roadway standards; however, the proposed project would not affect the overall safety of this road or increase the potential for transportation-related hazards.	Less than Significant	No mitigation is required.	Less than Significant
The proposed project would not conflict with any adopted policies, plans, or programs supporting alternative transportation in the study area	Less than Significant	No mitigation is required.	Less than Significant
4.11 Utilities and Service Systems			
The proposed project would not generate substantial amounts of domestic wastewater.	Less than Significant	No mitigation is required.	Less than Significant
The proposed project would generate incidental nonhazardous waste and hazardous waste during construction, operation, and decommissioning of the proposed project. Sources of waste during construction include construction debris (empty cement and sand bags, pallets and scrap material, empty drink and food containers, and plastic sheeting). Sources of waste anticipated during operations could include soil cuttings, drilling mud and rinse water, as well as incidental construction debris associated with repairs or routine maintenance and trash generated by construction personnel	Less than Significant	No mitigation is required.	Less than Significant

Table 1-2 Summary of Impacts and Mitigation			
Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
such as food and drink containers. Decommissioning of the proposed project, including IM-3, would generate a variety of construction debris, including concrete, metal sheeting, and pipe.			
UTIL-1: Operation of the proposed project would require up to 1.6 million additional kilowatt-hours of electricity annually. This electricity would either be generated on-site or would be provided by the electrical supply and delivery system for the City of Needles.	Potentially significant	**Mitigation Measure UTIL-1:** The proposed project would require additional electrical power. If it is determined that the proposed project would require additional off-site electrical supply, the project applicant shall coordinate with the City of Needles to provide for the continued maintenance, development, or expansion of electric systems to the project site necessary to accommodate the project demand, which is estimated at 1.6 million kilowatt-hours of electricity annually for the proposed project, in combination with the 1.8 million kilowatts used to power the IM-3 Facility, for a total of approximately 3.4 million kilowatts of electricity annually until IM-3 is decommissioned or significantly reduced. If it is feasible to reduce reliance on IM-3 and thereby reduce its associated energy demands, while phasing implementation of the final remedy, the additional energy demands of the project could possibly be met through on-site generation.	Less than Significant
4.12 Water Supply			
No consumptive use would be associated with the in situ treatment and freshwater flushing elements because all extracted water would come from the Colorado River Basin and would be returned to the Colorado River Basin via reinjection wells within the Colorado River accounting surface. Drinking water for use by construction personnel would be trucked from off-site. Other construction and operation and maintenance activities would require a small amount of water that would be served by PG&E's existing LCWSP entitlement. PG&E's existing LCWSP entitlement is sufficient to serve the project needs during construction, operation and maintenance, and decommissioning.	Less than Significant	No mitigation is required.	Less than Significant

Table 1-2
Summary of Impacts and Mitigation

Impacts	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
Impact WATER-1: While, from a water supply perspective, the consumptive use associated with the project is very small, localized effects on the groundwater table near the freshwater extraction wells are possible. Depending on where the extraction wells are sited, existing nearby supply wells could be adversely affected.	Potentially significant	**Mitigation Measure WATER-1:** To mitigate potentially significant effects on local groundwater levels associated with the freshwater extraction wells, in the event that freshwater is to be supplied from wells rather than from a surface intake, a hydrologic analysis shall be conducted during the design phase of the project to evaluate the proposed pumping rates for extraction, the potential cone of depression, and the extraction effect on any existing wells in proximity. Proximity shall be defined by the cone of depression boundary of any well to be used in the extraction process. Extraction well location and/or extraction rates shall be adjusted during project design based on this analysis to ensure that extraction does not substantially adversely affect the production rates of existing nearby wells (e.g., adversely affect well production such that existing land uses would not be supported). It shall be demonstrated using computer simulations or other appropriate hydrologic analysis that production rates of nearby wells will not be substantially affected before the installation of any new freshwater extraction wells.	Less than Significant

Data compiled by AECOM in 2010.

This page is left intentionally blank.

2 INTRODUCTION

This draft environmental impact report (DEIR) has been prepared by the California Department of Toxic Substances Control (DTSC), the lead agency under the California Environmental Quality Act (CEQA) (Public Resources Code, Section 21000 et seq.; California Code of Regulations Title 14 Section 15000 et seq. [CEQA Guidelines]), to evaluate the potentially significant environmental effects associated with the cleanup and remediation of contaminated groundwater at the Pacific Gas and Electric (PG&E) Topock Compressor Station (compressor station). Under CEQA, DTSC must identify and consider the potentially significant environmental effects of the actions proposed before making a final decision to approve the proposed project. This DEIR will be used in the planning and decision-making process by the lead agency (DTSC) and any responsible or trustee agencies.

This introductory chapter provides an overview of the environmental review process required under CEQA; background information related to the proposed project; agency roles and responsibilities; and the organization and terminology used in this DEIR. A detailed description of the proposed project that is the subject of this DEIR can be found in Chapter 3.

2.1 TYPE, PURPOSE, AND INTENDED USE OF THIS ENVIRONMENTAL IMPACT REPORT

Remediation of contaminated groundwater at the compressor station is being conducted under the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). Both RCRA and CERCLA are federal laws. RCRA provides a framework for the U.S. Environmental Protection Agency (EPA) to remediate hazardous waste sites in the U.S. This authority under RCRA, however, can be delegated to states. In California, DTSC implements RCRA under such delegated authority from the federal EPA through state law. The selection and approval of a final corrective action to remediate the contaminated groundwater at the compressor station is a discretionary action that will be made by DTSC. Activities associated with the corrective action may result in direct or indirect change in the physical environment. Therefore, this project is subject to environmental analysis under CEQA. Thus, pursuant to CEQA Guidelines Section 15367, DTSC is the CEQA lead agency for the proposed project under RCRA. Technically speaking, the proposed project being evaluated under CEQA is a "corrective action," which, generally, refers to the investigation and cleanup process at a hazardous waste site under RCRA. It should be noted as well that DTSC also has an ongoing Corrective Action Consent Agreement (CACA) with PG&E, which also describes DTSC's authority over the proposed project.

This DEIR was prepared by independent consultants to DTSC for purposes of assessing the potential environmental impacts that may arise in connection with actions being related to approval and implementation of the proposed project by California public agencies, as required under CEQA. The DEIR is intended to address the potentially significant adverse effects of the project on the physical environment, including infrastructure development to the extent such effects are reasonably foreseeable at this time.

2.1.1 COMBINED PROGRAM AND PROJECT-LEVEL ANALYSIS IN THIS ENVIRONMENTAL IMPACT REPORT

An EIR is an informational document that is intended to inform regulatory agency decision makers and the public of the environmental effects of a project (in this instance, the selection of the cleanup remedy for contaminated groundwater at the compressor station) and any potential measures to mitigate, reduce, or avoid significant impacts. It also discusses alternatives to the proposed project that could accomplish the primary objectives of the project while substantially reducing or avoiding significant environmental impacts.

CEQA authorizes lead agencies to prepare a program-level or "first-tier" analysis for some approval of a series of actions that are related geographically or as part of a suite of activities (14 California Code of Regulations Section 15168). By contrast a project-level EIR reviews specific plans for a discretionary action that may result in significant environmental effects (14 California Code of Regulations Section 15162).

This EIR provides a project-level analysis for the conceptual technical methods selected for the final remedy that would remediate contaminated groundwater at the compressor station. The proposed final remedy was described in the *Final CMS/FS for Solid Waste Management Unit 1 (SWMU 1)/Area of Concern 1 (AOC 1) and AOC 10* (Final CMS/FS) as Alternative E—In Situ with Freshwater Flushing. After a remedy concept is selected and approved, a Corrective Measures Implementation Workplan, followed by design plans for facility siting and operation and maintenance activities, will be prepared. This EIR also provides a program-level analysis of the construction of physical facilities that would be necessary to implement the proposed project (Alternative E from the Final CMS/FS), which have not yet been developed to specific plans and designs. Those specific plans and designs cannot feasibly be developed until a final remedy is selected.

The CEQA Guidelines (set forth in Title 14 of the California Code of Regulations) define a project EIR as "focusing primarily on the changes in the environment that would result from project development." As stated in Section 15161 of the CEQA Guidelines, a project specific EIR is required to "examine all phases of the project including planning, construction, and operation." A project-specific analysis has been prepared only for the selection of the final remedy to the extent that the Final CMS/FS presents the information regarding the technical combination of in situ treatment with freshwater flushing, as the general method of remediation. A copy of the Final CMS/FS can be found at DTSC's project website (http://www.dtsc-topock.com/). While the Final CMS/FS explains the types of facilities that would be required and are included in the proposed project, it does not identify the exact location or quantity of these facilities. Instead, a project area boundary is provided, anywhere within which the identified project facilities could be located. The exact location of project facilities would not be determined until the future design phase of the project, which is planned to occur after the approval of the project concept. Where the potential for project impacts is not tied to the exact location of project facilities (such as wells or utilities) or where variability in the final designs or locations of these facilities would not change the outcome of the impact analysis, a "project-level" analysis can be and has been prepared in the environmental assessments in Chapter 4.

As defined by the CEQA Guidelines Section 15168, a program EIR is an EIR which may be prepared on a series of actions that can be characterized as one large project and are related either:

1. Geographically;

2. As logical parts in the chain of contemplated actions;

3. In connection with rules, regulations, plans, or other general criteria to govern the conduct of a continuing program; or

4. As individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects which can be mitigated in several different ways.

A Program EIR is a type of EIR that allows a public agency to consider broad policy alternatives and program-wide mitigation measures at the early stages of planning. The final proposed remedy and related infrastructure needed to complete cleanup are geographically related because these activities occur in the same footprint Thus the combined program and project elements are appropriately analyzed at a program and project level of detail. Although no specific site locations for facilities are proposed at this time, the ultimate development of those facilities is recognized as the logical progression for cleanup if the proposed final remedy, as described below, is approved. This EIR therefore includes a dual-level analysis in order to ensure that the effects of developing the final remedy, and implementation of the final remedy, is not segmented, while recognizing that the components are at different stages of planning.

2.1.1.1 FUTURE REVIEW OF PROJECT-LEVEL DESIGNS

When PG&E reduces the proposed final remedy to specific designs associated with a discrete footprint within the project area, DTSC shall review these plans which would include the Corrective Measures Implementation Workplan and subsequent design. DTSC shall determine if the impacts associated with the project-level designs are generally consistent with the significance conclusions of this EIR, after implementation of mitigation. On this basis, DTSC shall determine whether the specific design for the final remedy is within the scope of the program EIR, pursuant to the provisions of Section 15168 of the CEQA Guidelines.

In some cases, site-specific mitigation planning may be necessary when project designs are available. This EIR evaluates these potential consequences to the extent possible and provides program-level mitigation measures and performance criteria to guide mitigation planning; however, site-specific impact or mitigation analyses have not been achievable at this juncture in project development.

2.1.2 CONTENTS AND PURPOSE OF THIS ENVIRONMENTAL IMPACT REPORT

In accordance with Section 15125 of the CEQA Guidelines, the EIR must include a description of the physical environmental conditions in the vicinity of the project as they exist at the time of the notice of preparation (NOP), or, if no NOP is published, at the time the environmental analysis begins. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. The environmental analyses contained in Chapter 4 of this DEIR uses the NOP as the baseline for the description of the physical conditions that might be affected by the proposed remedial options. However, based on a 2005 Stipulation and Settlement Agreement between DTSC and the Fort Mojave Indian Tribe regarding an interim remediation system that was constructed at the compressor station in 2004, the EIR must also evaluate potential impacts (on biological and cultural resources solely) using a baseline date of January 2004, the date after which construction of the interim remediation system was initiated. Therefore, this DEIR considers two separate baselines in analysis of potential impacts for biological and cultural resources. The analyses conducted using the January 2004 baseline date are contained in Chapter 7 of this DEIR.

This document has been prepared in sufficient detail to support a decision for approval or rejection of the proposed project. DTSC intends that this EIR be used by other local, regional, and state agencies in the approval process of related permits associated with cleanup efforts within the project area. These agencies are identified in Section 2.5 of this chapter. To the extent that the CEQA streamlining processes described above are available to such agencies, they may choose to rely on them as well.

The purpose of an EIR is not to recommend approval or denial of a proposed project. Rather, an EIR is required to identify the significant adverse environmental effects of a proposed project to the physical environment, and to further identify measures that avoid or mitigate those impacts to the extent feasible. If environmental impacts are identified as significant and unavoidable in the sense that no feasible mitigation measures or alternatives have been identified, DTSC may still approve the project after adopting all feasible mitigation measures and alternatives if, through the adoption of CEQA findings and statement of overriding considerations, it finds that social, economic, legal, technological, or other benefits outweigh these impacts.

2.2 BACKGROUND OF THE PROPOSED PROJECT

2.2.1 COMPRESSOR STATION HISTORY AND ACTIVITIES

The compressor station is owned and operated by PG&E. It began operating in 1951 and is still active today. From 1951 to 1964, the compressor station was located on a 65-acre property that PG&E leased from the U.S. Bureau of Land Management (BLM). In 1964, BLM transferred the property to the State of California and in 1965 PG&E purchased the property from the state. The compressor station is used to compress and cool natural gas for transport through PG&E pipelines to customers in central and northern California. Pipeline pressure must

be increased at regular distances along the pipeline to effectively transport natural gas through the pipelines. As the pressure is increased, the temperature of the gas also increases. Cooling towers located at the compressor station use water to lower the temperature of the gas before reintroducing the gas to the PG&E pipeline system.

The main structures at the facility include the cooling towers (Towers A and B), compressor building, and generator building (Exhibit 2-1). Adjacent to the main buildings are various auxiliary structures including an office, a warehouse, a vehicle garage, maintenance buildings, equipment and chemical storage buildings, and a water softening building. Aboveground tanks used for storage of water, water treatment chemicals, new and waste oil, gasoline and diesel fuel, and wastewater also are located at the facility. Exhibit 2-1 identifies existing infrastructure at the compressor station and vicinity.

When originally constructed, the facility was equipped with six compressors and could process 400 million standard cubic feet per day (scfd) of natural gas. As demand increased, PG&E added new compressors and upgraded existing compressors to increase the volume of gas that the compressor station could process. Most of the upgrades were completed by the mid-1950s. Following the upgrades, the facility is currently capable of processing 1.1 billion scfd of natural gas.

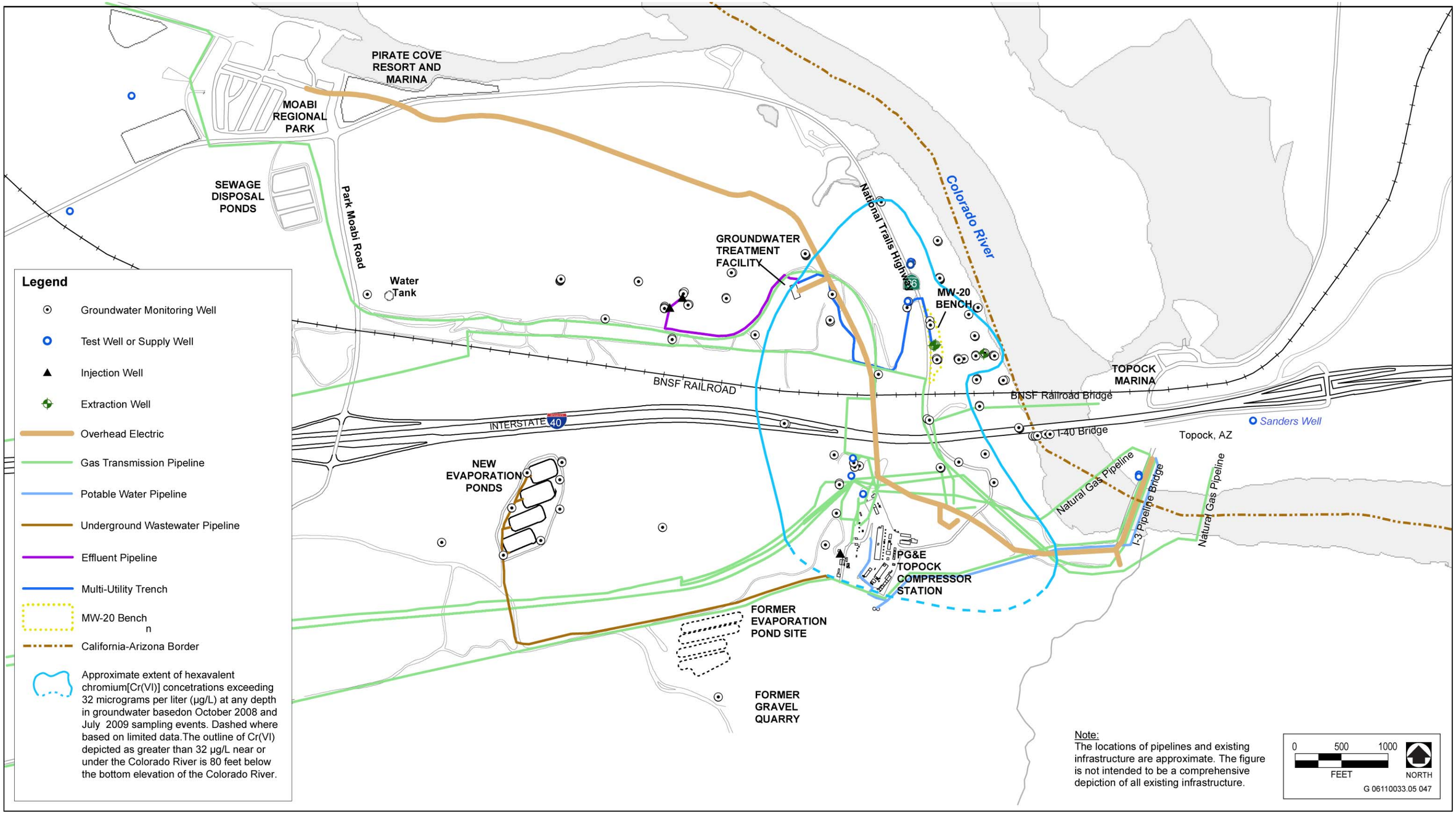
Currently, the compressor station processes between 300 million and 1.1 billion scfd of natural gas, depending on demand. The compressor station operates and is staffed 24 hours per day, 7 days a week. Operations at the compressor station have been relatively unchanged since it opened in 1951. The operations at the compressor station consist of: (1) conditioning the cooling water; (2) compressing the natural gas, (3) cooling the gas and compressor lubricating oil, (4) treating the wastewater that is generated during the cooling process, (5) maintaining the facility and equipment, and (6) miscellaneous operations.

2.2.2 CHEMICAL USE AND DISPOSAL AT THE COMPRESSOR STATION

From 1951 through 1985, PG&E added chromium to the water circulating in the cooling towers to inhibit corrosion, minimize scale, and control biological growth that affected the mechanical equipment. Chromium is a chemical found in air, soil, water, and food. There are two common forms of chromium: trivalent chromium [Cr(III)], which is considered an important mineral needed in small amounts for healthy human growth, and hexavalent chromium [Cr(VI)], which is considered harmful to human health at elevated concentrations, because it is carcinogenic if inhaled. While Cr(III) is the less toxic form of chromium for humans, it can have adverse impacts to the environment (e.g., plants, animals).

From 1951 to 1964, untreated wastewater (also known as “blowdown”) containing Cr(VI) was discharged directly to Bat Cave Wash, a natural wash located adjacent to the western boundary of the compressor station. During this period of uncontrolled wastewater discharge, an area of groundwater contaminated with Cr(VI), known as a plume, was formed. Beginning in 1964, PG&E began to treat the wastewater to convert Cr(VI) to Cr(III). Cr(III) is essentially insoluble and tends to bind to soil, so is not as easily transported to groundwater. PG&E also constructed a percolation bed in the wash by creating soil berms that impounded the discharged wastewater and allowed it to percolate into the ground and/or evaporate. In 1969, PG&E began treating the wastewater using a two-step process that converted Cr(VI) to Cr(III) and then removed the Cr(III).

Beginning in May 1970, wastewater discharges to Bat Cave Wash ceased, and treated wastewater was discharged to an injection well located on PG&E property, known as PGE-8. The well facilitated the injection of the treated wastewater into the subsurface at depths in excess of 405 feet below ground surface. In 1973, PG&E discontinued use of injection well PGE-8, and wastewater was discharged exclusively to a set of four, single-lined evaporation ponds located about 1,600 feet west of the compressor station.



Source: CH2MHill 2010, data adapted by AECOM 2010

Developed Land Uses and Existing Infrastructure **Exhibit 2-1**

PG&E replaced the Cr(VI)-based cooling water treatment products with nonhazardous phosphate-based products in 1985, at which time PG&E discontinued operation of the wastewater treatment system. Use of the four, single-lined evaporation ponds continued from 1985 to 1989. In 1989, the single-lined ponds were replaced with four new, Class II (double-lined) ponds. The wastewater treatment system and the single-lined ponds were physically removed and closed between 1988 and 1993. The four, Class II double-lined ponds are used currently. The disposal of wastewater from ongoing operations at the compressor station is regulated by the State of California's Colorado River Basin Regional Water Quality Control Board (RWQCB), a department under California's Environmental Protection Agency.

2.2.3 GROUNDWATER CONTAMINATION

RCRA corrective action activities at the compressor station were initiated in 1987 with the completion of a RCRA facility assessment (RFA) conducted by the U.S. EPA. The RFA identified areas of possible contamination through records review, data evaluation, interviews, and visual site inspection. The investigation activities conducted at the compressor station are summarized in the RCRA Facility Investigation and the CERCLA Remedial Investigation (RFI/RI) report. This document has been divided into three volumes. Volume 1 contains the site background and history of the compressor station. Volumes 2 and 3 contain information regarding the nature and extent of hazardous waste and constituent releases in groundwater and soil, respectively[1].

Based on the findings contained in the RFI/RI report, the principal contaminant in groundwater in the project area is Cr(VI). The majority of the Cr(VI) present in groundwater at the compressor station is believed to have been released during the 13-year period (1951–1964) when untreated wastewater was discharged to Bat Cave Wash. From the discharge locations in Bat Cave Wash, the cooling tower "blowdown" water infiltrated into the coarse sand and gravel of the wash bed and percolated downward approximately 75 feet through the unsaturated zone to reach groundwater.

In addition to Cr(VI), elevated concentrations of molybdenum, nitrate, and selenium have been detected within the boundaries of the contaminated groundwater plume. These contaminants are likely released through activities associated with facility operations including compression of natural gas, cooling of the compressed natural gas and compressor lubricating oil, water conditioning, wastewater treatment, and facility and equipment maintenance. However, due to the relatively limited sampling data and lower risks as compared with Cr(VI) at this site, these contaminants would be further addressed through monitoring and institutional controls during implementation of the remedy. Furthermore, it is anticipated that molybdenum, selenium and nitrate would be cleaned up with any of the remedial alternatives proposed by PG&E.

The Cr(VI) groundwater plume has been defined as chromium-bearing groundwater exceeding a regional background (or naturally occurring) value of 32 micrograms per liter (µg/l), or 32 parts per billion (ppb). Based on testing data to date, the majority of the Cr(VI) plume resides predominantly in the more permeable alluvial/fluvial deposits, with the southernmost portion extending into an area of less permeable bedrock known as the East Ravine. The contaminated groundwater plume underlies an area of approximately 175 acres and extends approximately 2,800 feet down-gradient of the former cooling water disposal area in Bat Cave Wash toward the Colorado River, which is adjacent to and east of the contaminated groundwater plume. The thickness of the plume varies from approximately 50 to over 150 feet. Extensive monitoring efforts indicate that the contaminated alluvial groundwater plume has not reached the surface waters of the Colorado River. Based on the results of well installations in the alluvial aquifer on the California and Arizona shores of the Colorado River, the chromium plume has not been detected in Arizona or under the Colorado River just south of I-40 (CH2M Hill 2008:3-2; CH2M Hill 2009; Figure 2-12, included in Appendix CMS of this EIR). The extent of the bedrock plume near the Colorado River is less certain. Cr(VI) concentrations range from less than 0.2 µg/l to 15,700 µg/l

[1] The revised final version of Volume 1 was issued on August 10, 2007. The final version of Volume 2 was issued on February 11, 2009. Volume 3 currently is being completed and is anticipated to be issued in 2011.

within the plume boundaries, with the highest concentrations observed in the area of the MW-20 and MW-24 benches (CH2M Hill 2008:Table 2-4).

A primary route of contaminant migration in the project area is through groundwater transport, given the proximity to the Colorado River. The groundwater gradient in the project area is slight, on the order of 0.0005 vertical feet per horizontal foot, and the hydraulic conductivity of the aquifer along the axis of the plume is moderate, averaging about 30 feet per day. Groundwater is therefore expected to move relatively slowly. The direction of groundwater flow from the source area in Bat Cave Wash generally is toward the north or northeast.

2.2.4 CORRECTIVE ACTION HISTORY

RCRA corrective action at the compressor station was initiated in 1987. Investigation and remedial activities have been ongoing since contamination was discovered at the compressor station in 1995. These activities include:

- groundwater and river water sampling and monitoring;
- extraction, treatment, and reinjection of groundwater;
- other environmental investigation activities; and
- evaluation of long-term cleanup technologies.

Groundwater and river water sampling, or monitoring, began in 1998 as part of initial site investigation activities, and a regular monitoring program is established at the compressor station. Monitoring activities include groundwater sampling from over 100 wells and river water sampling from 18 locations both along the shoreline and from the Colorado River channel (see Chapter 6, "Cumulative Impacts," regarding past groundwater remediation activities on-site and their corresponding level of CEQA documentation).

A total of 14 solid waste management units (SWMUs), 20 areas of concern (AOCs), and two other undesignated areas have been identified at the compressor station. The SWMUs, AOCs, and other undesignated areas have been identified at different times during the history of the RCRA corrective action process, and therefore, the status of the various sites differs. The status of sites ranges from those where no investigation has yet been performed to sites where remediation and closure have already been completed. For the purpose of developing appropriate conclusions and recommendations, the sites have been divided into three groups, identified below, according to their status within the site investigation, remediation, and closure process:

- SWMUs and AOCs for which the site investigation and closure process is complete,
- previously closed SWMUs and AOCs for which further investigation has been requested, and
- SWMUs, AOCs, and other undesignated areas to be carried forward in the RFI/RI.

Table 2-1 provides a summary of the names, locations, and status of the SWMUs, AOCs, units, and undesignated areas.

2.2.4.1 INTERIM MEASURES

As part of the corrective action process, in 2004, DTSC determined that immediate action was necessary at the compressor station, as a precautionary measure, to ensure that chromium-contaminated groundwater does not reach the Colorado River. Interim Measures (IM) were instituted to protect the Colorado River. IMs are cleanup actions that are taken to protect public health and the environment while long-term solutions are being developed and evaluated. There have been three separate but related IMs at the compressor station since 2004 in response to the need to control the groundwater plume. IM-1, IM-2, and most recently IM-3, are collectively referred to as the IM. The IM currently consists of three steps: (1) groundwater extraction from the areas of groundwater containing Cr(VI) for hydraulic control in the Colorado River floodplain, (2) treatment of extracted groundwater in a groundwater treatment plant, and (3) reinjection of the treated groundwater back into the subsurface through injection wells. This treated groundwater meets the standards set by DTSC and the RWQCB.

Table 2-1
Status of SWMUs, AOCs, Units, and Other Undesignated Areas

SWMU/AOC/Unit Number	Description
SWMUs and AOCs for Which Site Investigation and Closure Process is Complete	
SWMU 2	Inactive Injection Well PGE-8 (for soil only)
SWMU 3	PG&E Abandoned Well #6
SWMU 4	PG&E Abandoned Well #7
SWMU 7	Precipitation Tank
SWMU 10	Old Evaporation Ponds
AOC 2	Area Around Inactive Injection Well PGE-8
AOC 3	Area Around PG&E Inactive Wells #6 and #7 (PGE-06 and PGE-07)
Unit 4.6	Waste Oil Storage Tank
Previously Closed SWMUs and AOCs for Which Additional Investigation Has Been Requested	
SWMU 5	Sludge Drying Beds
SWMU 6	Chromate Reduction Tank
SWMU 8	Process Pump Tank
SWMU 9	Transfer Sump
Unit 4.3	Oil/Water Holding Tank
Unit 4.4	Oil/Water Separator
Unit 4.5	Portable Waste Oil Storage Tank
AOC 18	Former Two-Step Wastewater Treatment System Piping
Undesignated Area	Former 300B Pipeline Liquids Tank
SWMUs, AOCs and Other Undesignated Areas to be Carried Forward in RFI/RI	
SWMU 1	Former Percolation Bed[1]
SWMU 2	Inactive Injection Well PGE-8 (for groundwater only)
AOC 1	Area Around Former Percolation Bed[1]
AOC 4	Debris Ravine
AOC 5	Cooling Tower A
AOC 6	Cooling Tower B
AOC 7	Hazardous Materials Storage Area
AOC 8	Paint Locker
AOC 9	Southeast Fence Line (outside visitor parking area)
AOC 10	East Ravine[1]
AOC 11	Topographic Low Areas
AOC 12	Fill Area
AOC 13	Unpaved Areas within Compressor Station
AOC 14	Railroad Debris Site
AOC 15	Auxiliary Jacket Water Cooling Pumps
AOC 16	Sandblast Shelter
AOC 17	Onsite Septic System
AOC 19	Former Cooling Chemical Mixing Shed
AOC 20	Industrial Floor Drains
Undesignated Area	Potential Pipe Disposal Area

Note:
[1] Contaminated groundwater plume resulting from the release from SWMU 1, AOC 1, and AOC 10 are the subject of the final remedy for which this DEIR is prepared.
Source: Data compiled by AECOM in 2010

Notices of exemption were prepared pursuant to CEQA for IM-2 (February 2004) and IM-3 (June 2004), which are available for review on the project website at http://www.dtsc-topock.com/. It was determined that the notice of exemption was the appropriate level of CEQA review for IM-2 and IM-3 because the project activities were necessary to prevent or mitigate an emergency situation wherein the waters of the Colorado River may be impacted with a hazardous constituent, chromium, and immediate action was necessary to contain and reverse the flow of groundwater toward the Colorado River.

2.2.5 ONGOING EVALUATION OF SOILS CONTAMINATION

In addition to groundwater contamination, investigation activities conducted to date within the project area indicate that contaminants have been released to soils through past management practices such as those associated with hazardous materials handling/disposal, waste discharges, spills, and leaks of cooling water and other fluids at the compressor station. Investigation and cleanup of contaminated soils associated with the long-term operation of the compressor station is being conducted under both RCRA and CERCLA. The characterization of soil contamination on and around the compressor station is preliminary and is based on information collected during the RFI/RI data collection process. The nature and extent of hazardous waste and constituent releases in soil in detail, is in the process of development and is expected to be completed in 2013.

To date, the following chemicals have been detected in several soil samples at elevated concentrations: various metals (including chromium and hexavalent chromium), dioxins/furans, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and total petroleum hydrocarbons (TPH). Semi-volatile organic compounds have also been detected, but at lesser frequencies. Many of the highest contaminant concentrations are associated with waste materials within the Debris Ravine area (also known as AOC 4), which is located at the southern end of the compressor station on lands managed by DOI. To address the potential for imminent impacts to the downriver Havasu Wildlife Refuge property, DOI has directed PG&E to remediate portions of the Debris Ravine on an expedited schedule under a time-critical removal action pursuant to DOI's CERCLA authority. Additional soil samples will be collected at various SWMUs, AOCs, and undesignated areas to complete Volume 3 of the RFI/RI. Following completion of the soils investigation, risk assessments will be performed to estimate potential exposure levels, evaluate potential adverse effects of exposures, and estimate potential adverse human health and/or environmental effects based on carcinogenic, noncarcinogenic, and environmental risks. These assessments will determine whether contaminants are present at concentrations that pose unacceptable risk to human health and/or the environment. If it is determined that the presence of these contaminants represents an unacceptable risk, these investigations and assessments will form a basis for determining the geographic locations where risks must be controlled or eliminated through cleanup and/or removal.

DTSC originally planned to combine in a single remedy decision the groundwater and soil investigation and remediation, and to conduct both soil and groundwater evaluation and remediation simultaneously. By June 2007, it became apparent to DTSC that legal and technical impediments would delay the soils investigations and the subsequent development of a proposed remedy for any soil contamination. For instance, DTSC learned that certain aspects of the soils remediation project would require compliance with section 106 of the National Historic Preservation Act (NHPA), which is often a time-consuming process. Thus, at that time, DTSC decided that a single remedy decision for the two projects would not be feasible. Nevertheless, DTSC remained hopeful that it would be able to gather sufficient soil information to provide a program-level evaluation of the potential soil remediation along with the groundwater final remedy in a single environmental document under CEQA. For this reason, the May 2, 2008 release of the NOP referenced a single "final remedy" to address both soil and groundwater contamination at the station. However, delays in the soil investigations have continued in the time since DTSC issued the NOP and the lack of a full soil characterization has prevented the preparation of an evaluation of feasible remedies to address the soil contamination. DTSC anticipates that it will be able to begin evaluating a soils remedy in 2014. Because the extent of the soils contamination is not fully known and because feasible remedies have not been identified, inclusion of soils remediation in this EIR would involve a high degree of speculation. Such speculation is neither required under CEQA nor helpful in decision making.

Since the issuance of the NOP, DTSC has publically discussed its efforts to keep the soils and groundwater remediation projects on parallel tracks, and its subsequent decision to separate the analyses of the groundwater remedy from the soils remedy. This information, for instance, was evident in the published project schedules. The decision to select two formally separate remedies for groundwater and soil is reflected in the June 2007 project schedule and was presented at the Topock Consultative Work Group meeting held on June 20, 2007. At that time, DTSC still hoped that the projects would remain on relatively parallel tracks and could be evaluated in a single programmatic EIR. By the summer of 2008, however, the focus to select a final remedy for the restoration of the groundwater resource and protection of the Colorado River was intensified while the schedule for investigation of the soil contamination fell further behind.

In sum, at this time, due to limited soil contamination data, it is impossible to determine the extent of soil contamination at or surrounding the site, and thus even a preliminary determination of potential remediation needs are still undetermined. Therefore, this EIR could not feasibly analyze both the groundwater and soils remediation projects as envisioned during the release of the NOP in May 2008.

DTSC could delay moving forward with the groundwater remediation project, so that the groundwater and soils remediation projects could be analyzed in a single EIR. DTSC has determined, however, that it is not in the public interest to delay the groundwater remediation project until the soils remediation project is developed. The groundwater and soil remediation activities currently are on different schedules and tracks and will be evaluated in separate environmental documents. It is important to note that while it might have been more efficient administratively to pursue the two projects in tandem because of their geographic proximity and because of the commonality of stakeholders, these two projects are not dependent on one another for completion. The soils remediation project is not an expansion of the groundwater remediation project and will not change the nature or scope of the groundwater project. In fact, the two projects involve different contaminants and distinct environmental risks; while Cr(IV) may be present in the soil as well as the groundwater, elevated concentrations of dioxins/furans, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and total petroleum hydrocarbons (TPH), as well as some semi-volatile organic compounds, have also been detected in the soils. Because of the nature of the contamination and contaminated substrate, the two projects would necessarily employ different remediation technologies on different schedules for different durations. Potential soil contamination cleanup activities in the future may prove to be a key component of the overall cleanup efforts at the compressor station, but would represent a separate project from the groundwater remediation project and would have independent utility. If further soils investigations indicate that soils remediation is suggested, future environmental review would be required before initiating any remediation of contaminated soils.

The remedial alternatives evaluated for groundwater are anticipated to be different from the alternatives to be evaluated for soil. The RFI/RI Volume 3 and associated risk assessment will complete the evaluation of soils, and will provide conclusions about remedial objectives, if any, associated with any potential soil contamination that might migrate to groundwater. While this evaluation is not complete, it is not anticipated that this evaluation will redefine the objectives of the groundwater remedy. Thus, this DEIR does not consider future soil remediation activities as part of the proposed project; however, for the purposes of full disclosure soil remediation activities are considered a reasonably foreseeable future project and considered as part of the cumulative impacts analysis in Chapter 6 of this DEIR.

Such division of remedial activities at the Topock site is common at remediation sites. Much emphasis has been placed in recent years on reforming EPA policies for remediation sites to phase site remediation programs to focus resources on the areas or pathways of highest concern (e.g., Corrective Action Advance Notice of Proposed Rulemaking, EPA Results-based Approaches and Tailored Oversight Guidance document (EPA 530-R-03- 012 September 2003).

This approach is supported by the following legal precedence and directives:

- A "project" under CEQA is defined as the whole of an action which has the potential for resulting in either a direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment (Public Resources Code Section 21065). In this case, the "whole of the action" does not include soils cleanup activities.

- Currently, meaningful information is not available regarding the soil cleanup activities (*No Oil, Inc. v. City of Los Angeles* [1987] 196 Cal. App. 3d 223), and CEQA does not mandate that agencies engage "rank speculation as to possible future environmental consequences" of actions that may or may not occur in the future (*Laurel Heights Improvement Assn. v. Regents of University of California* [1988] 47 Cal.3d 376, 395).

- Information about the soils contamination and the associated cleanup is not necessary to make an environmentally informed decision whether to proceed with the groundwater contamination cleanup (*No Oil, Inc. v. City of Los Angeles* [1987] 196 Cal. App. 3d 223).

- The soils project is not a reasonably foreseeable consequence of the groundwater project, nor would the soils project change the scope or nature of the initial project (*Laurel Heights Improvement Assn. v. Regents of the University of California* [1988] 47 Cal.3d 376.) Rather the soils and groundwater projects, while geographically proximal, are separate distinct actions, and DTSC's decisions on the groundwater project will not affect its decisions on the soils project, and vice versa. Thus, the soils cleanup appears independent of, and not a contemplated future part of the groundwater cleanup efforts (*Christward Ministry v. County of San Diego* [1993] 13 Cal. App. 4th 31; *Del Mar Terrace Conservancy, Inc. v. City Council* [1992] 10 Cal.App.4th 712).

- CEQA Guidelines section 15165 provides that, "[w]here one project is one of several similar projects of a public agency, but is not deemed a part of a larger undertaking or a larger project, the agency may prepare one EIR for all projects, or one for each project, but shall in either case comment upon the cumulative effect."

- The EIR does consider the potential for the soils and groundwater remediation projects to result in cumulative impacts, the potential for such cumulative impacts is disclosed, and appropriate mitigation measures are identified.

2.3 AGENCY ROLES AND RESPONSIBILITIES

The CEQA Guidelines identify the lead agency as the public agency with the principal responsibility for carrying out or approving a project (14 California Code of Regulations Section 15367). DTSC is the CEQA lead agency for the proposed project because DTSC has the primary approval authority for the project. In addition to approving the final remedy, DTSC would approve the subsequent Corrective Measures Implementation Workplan, preliminary design, intermediate design (if needed), and final remedial design.

A number of other agencies in addition to DTSC will serve as Responsible and Trustee Agencies, pursuant to CEQA Guidelines Section 15381 and Section 15386, respectively. This DEIR provides environmental information to these and other public agencies, which may be required to grant approvals or otherwise coordinate with DTSC, PG&E, or other agencies as part of project implementation. For the purposes of CEQA, the term "responsible agency" includes all state and local public agencies other than the lead agency that have discretionary approval power over the project (14 California Code of Regulations Section 15381). "Trustee agencies" are state agencies that have jurisdiction by law over natural resources affected by the project and held in trust for the people of the state, such as the California Department of Fish and Game and the State Lands Commission (CEQA Guidelines Section 15386). Future discretionary approvals may include issuance of a permit, if not otherwise exempt as explained below, or other required action. Responsible agencies may consider and use the analysis provided in this DEIR to satisfy their responsibilities under CEQA, as they deem appropriate. Federal

agencies may review the DEIR and submit comments and/or use the information in this DEIR as part of their own approval processes.

As noted above, CERCLA includes an exemption for removal or remedial actions conducted entirely on-site, and where such remedial action is selected and carried out in compliance with Section 121. Specifically, CERCLA Section 121(e)(1) provides that: "No Federal, State, or local permit shall be required for the portion of any removal or remedial action conducted entirely on-site, where such remedial action is selected and carried out in compliance with this section." (See 42 U.S.C. Section 9621 [e][1], also referred to as Section 121[e][1]). The Code of Federal Regulations provide that: "[t]he term on-site means the areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of the response action." (40 CFR Sections 300 and 400[e][1]). Substantive elements or conditions that would be required by a particular permit, however, must still be attained after conferring with the applicable agency, consistent with the requirements of CERCLA. The general intent behind the above provisions is that CERCLA actions should not be delayed by time-consuming and duplicative administrative requirements such as permitting, although remedial remedies should achieve the substantive standards of otherwise applicable laws.

The on-site portions of remedial actions taken under CERCLA authority must meet the substantive provisions of promulgated requirements that are applicable or relevant and appropriate to the actions (ARARs), which were determined by DOI, BLM, USFWS, and Bureau of Reclamation (DOI 2009). ARARs must be attained by the remedial action pursuant to Section 121(d) of CERCLA, which assures protection of human health and the environment, and requires attainment of "legally applicable or relevant and appropriate standard(s), requirement(s), criteria, or limitation(s)." There are four basic criteria that define ARARs: (1) substantive rather than administrative, (2) applicable or relevant and appropriate, (3) promulgated state requirements which are more stringent than comparable federal standards, and (4) categorized as Chemical-specific, Location-specific, or Action-specific. ARARs were considered in the preparation of the Final CMS/FS, and are included as Appendix B to that document. Criteria, guidance, advisories, and proposed standards that are not legally binding are not ARARs, but may be considered and used as appropriate to ensure the protectiveness of the remedy. These are referred to as "To Be Considered" criteria (TBCs). DOI, as the lead agency for remedial actions taken under CERCLA authority, has established a list of ARARs and TBCs for the site, which is presented in the Final CMS/FS (CH2M Hill 2009:3-3 through 3-6 and Appendix B, included in Appendix CMS of this EIR).

In accordance with the Topock Administrative Consent Agreement, the various response and corrective actions required to clean up groundwater contamination within the project area are exempt from obtaining permits pursuant to CERCLA Section 121(e)(1). If the exemption is found not to apply for any particular proposed action or approval not sufficiently related to clean up of the site, a permit may be required. Because it is unclear what specific future actions may be requested by PG&E in the future, DTSC is unable to conclude with absolute certainty that the CERCLA exemption will be found to apply to all future actions that may arise. As discussed throughout this EIR, therefore, some of the following agencies may need to issue permits or approvals relating to the following activities if not otherwise deemed exempt under CERCLA.

2.3.1 RESPONSIBLE AND TRUSTEE AGENCIES

Responsible and trustee agencies may include, but are not limited to the following State, regional, and local agencies:

- The State of California Colorado River Basin RWQCB for Clean Water Act (CWA) may be asked to issue a Section 401 water quality certification, in support of any CWA Section 404 permit obtained from the USACE (see below). Pursuant to Section 401 of the Clean Water Act, every applicant for a USACE 404 permit must obtain state certification that the proposed activity will not violate state or federal water quality standards. Additionally, the project may obtain coverage under the General Construction Activity Stormwater National Pollutant Discharge Elimination System (NPDES) permit (33 U.S. Code Section 1341). The NPDES General Construction Permit is issued by the State Water Resources Control Board. In order to obtain coverage under

this permit, a Notice of Intent and Storm Water Pollution Prevention Plan (SWPPP) must be submitted to the RWQCB.

- The California State Lands Commission may act as a responsible agency for issuance of rights-of-way or leases for project activities that would occur on land owned or managed by the California State Lands Commission.

- In addition to their role in approving investigations on lands held by the state, the California State Lands Commission is a responsible agency regarding state-owned "sovereign" lands such as the beds of navigable waters.

- The California Department of Fish and Game may be asked to issue permits pursuant to the California Endangered Species Act (California Fish and Game Code Section 20810 for listed species status and for streambed alteration agreements (California Fish and Game Code Section 1600 et seq.) for alteration of the bed or banks of surface waters. The California Department of Fish and Game is also a trustee agency responsible for protecting fish and wildlife resources in the state.

- The California Department of Transportation may be asked to issue rights-of-way or leases for project activities that would occur on land owned or managed by California Department of Transportation (Caltrans).

- The Mojave Desert Air Quality Management District may be consulted regarding air quality and emissions and may be asked for certain permit approvals.

- The State Historic Preservation Officer may be asked for review of projects within the State of California for purposes of protecting historic and archeological resources pursuant to the Public Resources Code, Sections 5020 et seq. and Section 21083.2 et seq.

- The Metropolitan Water District of Southern California (MWD) may be asked for rights-of-way or leases related to construction and operation of any portion of the project that would occur on MWD land.

- The San Bernardino County Division of Environmental Health may be asked to approve permits for well installation and potentially for on-site treatment of hexavalent chromium in groundwater and Health and Safety Plans and Soil Management Plans related to investigation and cleanup activities at the site.

- The San Bernardino County Fire Department may be asked to approve permits for tank installations associated with the investigation and cleanup of the project area.

2.3.2 FEDERAL

The following federal agencies may review the DEIR and submit comments and/or use the information in this DEIR at their own discretion and in their own approval of any federal action not otherwise exempt as part of the remediation:

- EPA is the federal agency that enforces the federal RCRA (42 U.S. Code Section 6901 et seq.) and that is responsible for oversight related to the investigation and corrective action activities being conducted at the site by DTSC under their delegated authority to implement RCRA within California.

- The U.S. Army Corps of Engineers may be asked to issue a Section 404 permit pursuant to the CWA (33 U.S. Code Section 1344) for project-related discharges of dredged fill into waters of the United States. The proposed project may impact jurisdictional waters regulated by USACE. Section 404 of the Clean Water Act typically requires USACE approval prior to the discharge of dredged or fill material into "waters of the U. S." In general, work in rivers, streams, certain ephemeral washes, or wetlands require an USACE 404 permit. USACE may also be asked to issue a permit under Section 10 of the Rivers and Harbors Appropriations Act

of 1899. Section 10 requires permits for all structures, such as riprap, and activities, such as dredging, in navigable waters of the United States.

- The U.S. Bureau of Reclamation has oversight authority for constructions, operations and maintenance of the Lower Colorado Water Supply Project, from which PG&E derives water rights.

- The U.S. Fish and Wildlife Service (USFWS) may be asked to issue incidental take authorization for species listed as threatened or endangered under Section 7 of the federal Endangered Species Act (16 U.S. Code Section 1535[a][2]);

- The BLM and USFWS may be asked to issue rights-of-way or leases for project activities that would occur on lands managed or owned by these agencies.

- The BLM, USFWS, and the U.S. Bureau of Reclamation, as land managing agencies with authority over lands on which project activities would occur, would also be responsible for compliance with Executive Order 13007. This order requires federal agencies, to the extent practicable and permitted by law, and not clearly inconsistent with essential agency functions, to accommodate access to and ceremonial use of Native American sacred sites by Native American religious practitioners and avoid adversely affecting the physical integrity of such sacred sites. Where appropriate, agencies shall maintain the confidentiality of sacred sites.

2.3.3 ARIZONA AGENCIES

The project may require rights-of-way or leases from the Arizona State Land Department or Arizona Department of Transportation for project activities that would occur on lands under the department's jurisdiction. If freshwater wells in Arizona are needed for the project, coordination or approval from Mohave County may be required with regard to the construction of those wells and any support facilities.

2.3.4 CONSULTATION AND COORDINATION

Notice, outreach, and consultation were conducted with trustee and responsible agencies, federal agencies, tribal representatives, and members of the public and relevant communities during the CEQA scoping process. The results of the scoping process, including received comments, are summarized in the *Scoping Report for the Draft Environmental Impact Report, Pacific Gas and Electric Company, Topock Compressor Station, Environmental Investigation and Cleanup Project,* which is incorporated by reference as provided for in the CEQA Guidelines (California Code of Regulations Section 15150). The report is available for inspection at the offices of DTSC (5796 Corporate Avenue Cypress, California 90630). Consultation and coordination with federal, state, and local agencies that would issue permits, approvals, or access to the project site are ongoing.

2.4 REMEDIATION AND ENVIRONMENTAL REVIEW PROCESS

2.4.1 REMEDIATION PROCESS

As described above, corrective action activities under RCRA at the compressor station were initiated in 1987 with the completion of an RFA conducted by the EPA. Below is an overview of the main steps that are required during the corrective action process:

- Preliminary review of pertinent existing information is executed.

- A **visual site inspection** verifies preliminary information about the site and includes a developed sampling strategy, if needed.

- A **sampling visit** gathers limited field data.

- **RCRA facility assessments** are the first step in the corrective action process. It is a detailed, preliminary site assessment to determine whether or not potential substances or other constituents of concern exist in soils or groundwater at or near a facility, which may be required to undergo some form of corrective action under RCRA. The RFA for the compressor station was submitted to the DTSC in August 1987.

- **RCRA facility investigation/remedial investigations** occur in the corrective action process following the RFA. It is an in-depth study designed to gather data needed to determine the nature and extent of contamination at the site. PG&E has completed two volumes of the RFI/RI report and has conducted additional studies to help evaluate cleanup options and technologies. Volume 3, addressing soil characterization and remaining areas of concern, is anticipated to be completed in late 2012 or early 2013.

- **Human and ecological risk assessments** are qualitative and quantitative evaluations of the risk posed to human health and/or the environment by the actual or potential presence and/or use of specific pollutants.

- C**orrective measures study/feasibility studies (CMS/FSs)** develop and evaluate alternatives that can be used to address contamination. The *Final CMS/FS for Solid Waste Management Unit 1 (SWMU 1)/Area of Concern 1 (AOC 1) and AOC 10* (Final CMS/FS) was submitted to DTSC in December 2009 and is the basis for development of the remedial alternatives evaluated in this DEIR.

- A **statement of basis** is a type of document that describes the basis for DTSC's proposed final remedy and cleanup standards and is considered within this DEIR.

- **CEQA** is a state law that requires the lead agency, in this case DTSC, to analyze and disclose to the public all potential environmental impacts that could result from the agency-approved cleanup activities at the compressor station. This DEIR is intended to meet CEQA requirements for this project.

- **Corrective Measures Implementation** is implementation of the selected remedy.

- **Corrective action certification** is given when DTSC deems the action complete.

2.4.2 ENVIRONMENTAL REVIEW PROCESS

As required by CEQA Guidelines Section 15375, a notice of preparation (NOP) is a brief notice sent by the lead agency to notify the responsible agencies, trustee agencies, the Office of Planning and Research, and involved federal agencies that the lead agency plans to prepare an EIR for the project. The purpose of the notice is to solicit guidance from those agencies as to the scope and content of the environmental information to be included in the EIR and to solicit recommendations and develop information regarding the scope, focus, and content of the EIR. An NOP was prepared for the proposed project and is included as Appendix A. The NOP identified the project location, described the need for and objectives of the project, and identified the probable environmental effects of the project. The NOP was circulated to responsible and trustee agencies, federal agencies, and interested members of the public. The NOP public comment period began on May 2, 2008, and concluded on July 1, 2008.

Concurrent with the issuance of the NOP, public meetings were held during the 30-day public comment period. The meetings were open to the agencies mentioned above and to any interested organizations and individuals, including Native American tribes that have expressed interest in the potential effects of proposed remediation activities on cultural resources located near the compressor station. Several Native American tribes were invited to attend the scoping meetings. The tribes were contacted based on an inquiry that was forwarded to the Native American Heritage Commission (NAHC) requesting a list of Native American tribal representatives that may have knowledge of cultural resources in the project area. The NAHC provided a list of 10 tribal representatives that may have knowledge of cultural resources in the project area. The list of tribal representatives to be contacted was then expanded to 13 based an understanding of the region and past tribal interest that had been expressed in other activities that have taken place at the compressor station.

The Native American tribal governments that have been contacted regarding the proposed project include the Fort Mojave Indian Tribe, Colorado River Indian Tribes, Chemehuevi Indian Tribe, Cocopah Indian Tribe, Fort Yuma-Quechan Indian Tribe, Havasupai Indian Tribe, Hualapai Indian Tribe, Morongo Band of Mission Indians, San Manuel Band of Mission Indians, Serrano Nation of Indians Torres-Martinez Desert Cahuilla Indian Tribe, Twenty-Nine Palms Indian Tribe, and the Yavapai-Prescott Tribe. Subsequent to the NOP scoping meetings, an extensive communication program was conducted with involved tribes that included formal meetings with tribal councils, informal meetings and field visits with cultural resource personnel and tribal elders, and solicitation of written comments. Information obtained through the scoping meetings and the subsequent communication program has been incorporated into this DEIR.

Public and agency review of the project will be further facilitated by DTSC through distribution of this DEIR for a 45-day public review period. The public review period will extend from June 4 to July 19, 2010. This EIR, as well as appendices and all supporting materials and references, can be found at the project website (www.dtsc-topock.com and www.dtsc.ca.gov) and the following locations:

Needles Library
1111 Bailey Avenue
Needles, CA 92363

Chemehuevi Indian Reservation Environmental Protection Office
2000 Chemehuevi Trail
Havasu Lake, CA 92363

Golden Shores/Topock Library Station
13136 South Golden Shores Parkway
Topock, AZ 86436

California Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, CA 90630

Colorado River Indian Tribes Public Library
Second Avenue and Mojave Road
Parker, AZ 85344

Parker Public Library
1001 Navajo Avenue
Parker, AZ 85344

Lake Havasu City Library
1770 McCulloch Boulevard
Lake Havasu City, AZ 86403

Four public meetings will be held at the locations and times identified below to present the contents of this DEIR and to receive written and oral comments. Public meetings will include a 2-hour open house, where the public is invited to review technical information that is presented in the DEIR, and a 1-hour public hearing that will give the public opportunity to provide oral public comments to the lead agency. Following the close of the DEIR public review period, DTSC will prepare and publish a second document that contains responses to all comments received on the DEIR. The DEIR, comments, and responses together constitute the final EIR, which will be used by DTSC for consideration during decision making for the project.

Parker, Arizona:
Parker Community/Senior Center
1115 12th Street
Parker, Arizona 85344
Tuesday, June 22, 2010
Open House—5:00 p.m. to 6:30 p.m.
Public Hearing—6:30 p.m. to 8:00 p.m.

Topock, Arizona:
Topock Elementary School Auditorium
5083 East Tule Drive
Topock, AZ 86436
Wednesday, June 30, 2010
Open House—5:00 p.m. to 6:30 p.m.
Public Hearing—6:30 p.m. to 8:00 p.m.

Lake Havasu City, Arizona:
Lake Havasu City Aquatic Center
100 Park Avenue
Lake Havasu City, AZ 86403
Wednesday, June 23, 2010
Open House—5:30 p.m. to 7:00 p.m.
Public Hearing—7:00p.m. to 8:30 p.m.

Needles, California
Needles High School
1600 Washington Street
Needles, CA 92363
Tuesday, June 29, 2010
Open House—5:00 p.m. to 6:30 p.m.
Public Hearing—6:30 p.m. to 8:00 p.m.

Please submit your written comments on the DEIR, with the subject line "Topock DEIR Comments," postmarked or dated (for e-mails) no later than July 19, 2010, to:

Aaron Yue
Project Manager
California Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, CA 90630
ayue@dtsc.ca.gov
Phone: 714-484-5439
Fax No.: 714-484-5411

2.5 SCOPE OF THIS ENVIRONMENTAL IMPACT REPORT

The scope of the analysis contained within this DEIR is focused on the environmental resource areas that could be affected by construction or operation of the proposed project. The DEIR therefore addresses the following environmental issues:

- aesthetics
- air quality
- biological resources
- cultural resources
- geology and soils
- hazardous materials
- hydrology and water quality
- land use and planning
- noise
- transportation
- utilities and service systems
- water supply

It was determined that several issue areas would not be affected by implementation of the proposed project based on a review of the NOP, public comments received on the NOP, comments from the public scoping meetings, and review of existing information. These issue areas include agricultural resources, mineral resources, population and housing, public services, and recreation. Section 5.3 of this DEIR provides a summary of those issue areas for which a detailed analysis is not included and the basis for those determinations.

2.6 DEIR ORGANIZATION

This DEIR is organized into chapters, as identified and briefly described below. Chapters are further divided into sections (e.g., Section 4.2, "Air Quality").

Chapter 1, "Summary": This chapter presents a summary of the proposed project activities and the potential environmental impacts. It describes mitigation measures that would be implemented and level of significance after mitigation (as fully described in Chapter 4). It also provides a summary of alternatives to the proposed project, a summary of known controversial issues, and issues to be resolved.

Chapter 2, "Introduction": This chapter presents a discussion of the purpose and use of this DEIR; the history and activities that have occurred at the compressor station; the contamination identified in the vicinity of the compressor station to date; the environmental review and CEQA process; and the organization of this DEIR.

Chapter 3, "Project Description": This chapter provides a detailed description of the proposed project, including the construction, operation, and decommissioning phases. It defines the project need and objectives, describes all the features of the proposed project, and provides a summary of the alternatives to the proposed project.

Chapter 4, "Environmental Analysis": For each environmental issue listed above in Section 2.5, this chapter describes the existing environmental and regulatory setting, evaluates the potential environmental impacts associated with the proposed project, identifies mitigation for significant impacts, and discusses the level of significance after implementation of those mitigation measures.

Chapter 5, "Other CEQA Sections": This chapter identifies those areas where environmental impacts are considered significant and unavoidable. It also summarizes those areas where no environmental effects are anticipated and no further analysis is necessary. The growth inducing effects of the proposed project are also considered in this chapter.

Chapter 6, "Cumulative Impacts": This chapter identifies other past, present, and reasonably foreseeable actions at and in the vicinity of the compressor station. It evaluates the cumulative impacts associated with implementation of the proposed project in combination with the other identified projects. Where necessary, it identified additional mitigation measures in order to reduce or avoid significant cumulative impacts.

Chapter 7, "Alternative Baseline Analysis Pursuant to the Settlement Agreement": This chapter addresses the applicable requirements of a stipulation and settlement agreement concerning the IM-3 site (Case No. 05CS00437 of the Superior Court of the State of California, Sacramento County). Specifically, this chapter provides an overview of the settlement agreement and evaluates the potential for environmental effects to cultural and biological resources on the IM-3 site based on the environmental setting as of January 2004, in accordance with the settlement agreement.

Chapter 8, "Alternatives to the Proposed Project": This chapter provides additional meaningful information regarding project alternatives to be considered by decision makers in compliance with Section 15126.6 of the CEQA Guidelines. This alternatives analysis evaluates a range of potential alternatives that may reduce environmental impacts associated with implementation of the proposed project. In addition, this chapter summarizes the alternatives that were rejected from further consideration because they did not meet project goals and objectives, or were determined to be impractical or infeasible.

Chapter 9, "Other Informational Analyses": This chapter includes additional analyses that may be helpful to decision makers, but are not required by CEQA. Specifically, the issues of environmental justice and socioeconomics are included in this chapter. These analyses were determined to be beneficial in aiding the federal decision making, but are not germane to the CEQA analysis. Effects analyzed under CEQA must be related to a physical change on the environment (CEQA Guidelines, Section 15358[b]) and economic and social effects are not considered environmental effects under CEQA unless tied to a reasonably foreseeable indirect effect to the physical environment. (CEQA Guidelines, Section 15131).

Chapter 10, "Bibliography": This chapter sets forth a comprehensive listing of all sources of information used in the preparation of DEIR. This includes organizations and persons that were contacted during the preparation of this DEIR.

Chapter 11, "List of Preparers": This chapter identifies the lead agency personnel and consultants involved with preparation of this DEIR.

Chapter 12, "Glossary": This chapter provides a glossary of key terms and definitions that are used throughout the DEIR.

Appendices: This DEIR includes several appendices that provide either background information or additional technical support for the analysis.

2.7 TERMINOLOGY USED IN THIS DEIR

This DEIR includes the following CEQA terminology to denote the significance of environmental impacts of the proposed project:

- **Less-than-significant impact:** A less-than-significant impact does not result in a substantial adverse change in the environment. Impacts at this level do not require mitigation measures.

- **Significant impact:** CEQA Section 21068 defines a significant impact as "a substantial, or potentially substantial, adverse change in the environment." The environmental checklist included as Appendix G of the CEQA Guidelines provides additional guidance for determining which impacts would be regarded as significant. This DEIR uses the CEQA definition of "significant impact." Mitigation measures or alternatives to the project must be identified in an attempt to reduce the magnitude of significant impacts to less-than-significant levels.

- **Potentially significant impact:** A potentially significant impact is one that, if it were to occur, would be considered a significant impact as described above; however, the likelihood of the impact's occurrence is uncertain. For example, although the EIR may provide evidence that buried archaeological resources could be found in a particular location, the actual discovery cannot be determined until the time of project construction. For CEQA purposes, a potentially significant impact is treated (e.g., mitigated) as if it were a significant impact. Mitigation measures or alternatives to the project must be identified in an attempt to reduce the magnitude of potentially significant impacts to less-than-significant levels.

- **Significant and unavoidable impact:** A significant and unavoidable impact is a substantial adverse effect on the environment that cannot be mitigated to a less-than-significant level. A project with significant and unavoidable impacts could still proceed, but DTSC would be required to prepare a statement of overriding considerations, pursuant to CEQA Guidelines Section 15093, explaining why DTSC would proceed with the project in spite of the potential for significant environmental impacts.

- **Threshold of significance:** A threshold of significance is a criterion established by the lead agency to identify at what level an impact would be considered significant. A criterion is defined by a lead agency based on examples found in CEQA or the CEQA Guidelines, scientific and factual data relative to the lead agency jurisdiction, views of the public in affected areas, the policy/regulatory environment of affected jurisdictions, and other factors.

3 PROJECT DESCRIPTION

3.1 INTRODUCTION

As required by the CEQA Guidelines, this chapter provides a description of the proposed project (including its location), and a statement of the objectives sought by the proposed project (CEQA Guidelines Section 15124). The statement of objectives includes the underlying purpose of the project and assisted DTSC in developing the reasonable range of alternatives, as evaluated in Chapter 8, "Alternatives to the Proposed Project," of this DEIR. This chapter also includes a general description of the project's technical, economic, and environmental characteristics and describes the intended uses of the DEIR (CEQA Guidelines Section 15124.)

The proposed project is to implement a final corrective action remedy to address groundwater contamination at the proposed project area. DTSC's approval of this project is subject to California Health and Safety Code (CHSC) Sections 25187 and 25200.10, which implement the federally delegated authority under RCRA. CHSC Section 25187 authorizes DTSC to order action necessary to correct violations and to assess a penalty when DTSC determines that any person has violated specified provisions of the CHSC or any permit, rule, regulation, standard, or requirement issued pursuant to the CHSC. DTSC may require corrective action(s) when there is a release (as defined in Chapter 6.5 of the CHSC) of hazardous waste or constituents into the environment from a hazardous waste facility. If corrective action is not taken within the specified time frame or if DTSC determines that immediate corrective action is necessary to prevent an imminent substantial danger to the public health and the environment, DTSC may contract to perform the corrective action, at the expense of the violating facility. Section 25200.10 specifically addresses the corrective action of a permitted hazardous waste facility. The section states that the permit shall require corrective action for all releases of hazardous waste or constituents from a solid waste or hazardous waste management unit at a facility engaged in hazardous waste management. The section further states that any corrective action be taken beyond the facility boundary where necessary to protect human health and safety or the environment, unless the facility operator is unable to obtain the necessary permission for completing the corrective action.

The specific activities that would be authorized by DTSC, if approved, are those identified as Alternative E—In Situ Treatment with Freshwater Flushing in the document titled Final CMS/FS for Solid Waste Management Unit 1 (SWMU 1)/Area of Concern 1 (AOC 1) and AOC 10 (Final CMS/FS) (CH2M Hill 2009, included in Appendix CMS of this EIR). Alternative E is the "project" for purposes of this EIR and is described and analyzed herein.

As described in Chapter 2, "Introduction," groundwater in the vicinity of the compressor station has been contaminated by historical releases of chemicals of potential concern (COPCs), including Cr(VI), total chromium [Cr(T)], molybdenum, selenium, and nitrate. Cr(VI) was used as a corrosion inhibitor at the compressor station between 1951 and 1985. DTSC concluded that these chemicals are harmful to human health. For instance, Cr(VI) is considered carcinogenic through inhalation and ingestion. The groundwater beneath and around the compressor station has been adversely affected as a result of the historical releases. Currently, the groundwater basin beneath the project area is designated for beneficial uses including, but not limited to, industrial uses and drinking water. The affected groundwater containing Cr(VI) also has the potential of reaching the Colorado River if not abated. This chapter describes the proposed project, or "final remedy," associated with the cleanup of the groundwater contamination. It describes the location of the proposed project, defines the project objectives, and the purpose and need for the proposed project. Chapter 8 provides an overview of potential alternatives to the proposed project.

3.2 PROJECT LOCATION

The proposed project is situated in the vicinity of the compressor station, located in the Mojave Desert approximately 12 miles southeast of the City of Needles, California, and 1 mile southeast of the Moabi Regional

Park in California (Exhibits 3-1 and 3-2). The compressor station is approximately one-half mile west of the community of Topock, Arizona, which is situated directly across the Colorado River and is 5 miles south of Golden Shores, Arizona. The compressor station is approximately 1,500 feet west of the Colorado River and less than 1 mile south of Interstate 40 (I-40). The compressor station is within a 66.8-acre parcel of land owned by the Pacific Gas and Electric Company (PG&E). The area of the compressor station that is developed is fenced and encompasses approximately 15 acres. As shown in Exhibit 3-2, the area within which corrective action activities would occur (the "project area") includes 40.3 acres of the 66.8-acre PG&E-owned parcel as well the immediate surrounding area that could be affected by construction, operation, and/or decommissioning activities associated with the proposed project. This project area encompasses 779.2 acres. The lands adjoining the PG&E parcel are owned and/or managed by a number of government agencies and private entities, including the Havasu National Wildlife Refuge, which is managed by the U.S. Fish and Wildlife Service; lands managed by the U.S. Department of Interior, Bureau of Land Management; U.S. Bureau of Reclamation managed by the U.S. Bureau of Land Management; the Burlington Northern Santa Fe Railway (BNSF); California Department of Transportation–leased land; lands owned by the Fort Mojave Indian Tribe; and privately owned lands. Exhibit 3-3 depicts the division of land ownership within the project area and the horizontal limits of the contaminated groundwater plume.

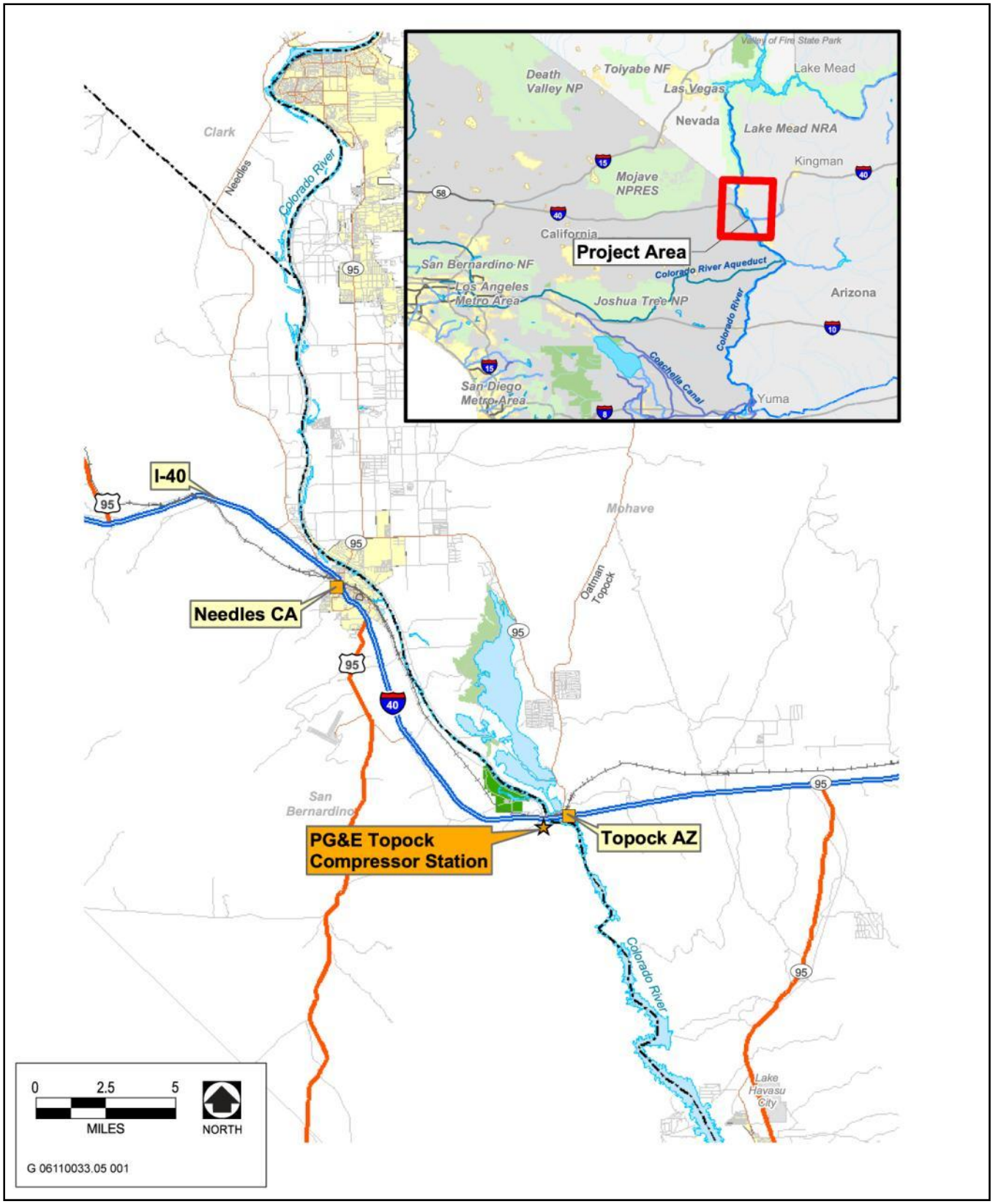
3.3 PROJECT PURPOSE

Past activities at the compressor station have resulted in contamination of groundwater with Cr(VI), Cr(T), molybdenum, selenium, and nitrates, which have the potential to affect human health and the environment. Protection of California's groundwater resources, including the Colorado River, which is adjacent to the contaminated groundwater plume, is one of DTSC's highest priorities. DTSC has directed PG&E to take actions, which include operation of the existing IM-3 Facility, to control the groundwater gradient in the floodplain area of the site from the compressor station to protect the Colorado River (see Section 2.2.5). This measure has proved successful to date in preventing contaminated groundwater from reaching the Colorado River. However, further actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Resource Conservation and Recovery Act (RCRA) corrective action process, which is a process designed to evaluate the nature and extent of releases of hazardous substances and implement appropriate protective measures, are needed to ensure the long- term effectiveness and protection of human health and the environment. Thus further cleanup actions are needed to treat the contaminated groundwater plume.

The long-term cleanup options are summarized in the Final CMS/FS (CH2M Hill 2009, included in Appendix CMS of this EIR). The Final CMS/FS was evaluated by stakeholders, agencies, and tribal governments interested in the site. The CMS/FS identifies the cleanup objectives, evaluates remedial alternatives, and provides the basis for selecting a recommended alternative to address the defined objectives for the remedial action. As the lead agency under the RCRA, DTSC reviewed the alternatives considered in the Final CMS/FS and agrees with PG&E's recommendation in the Final CMS/FS that Alternative E—In Situ Treatment with Freshwater Flushing provides the best balance within the regulatory selection criteria framework identified in the Final CMS/FS and the potential site impacts identified within this EIR. The Alternative E—In Situ Treatment with Freshwater Flushing remedy is, therefore, carried forward in the statement of basis under the RCRA corrective action process and for analysis as the proposed project in this EIR.

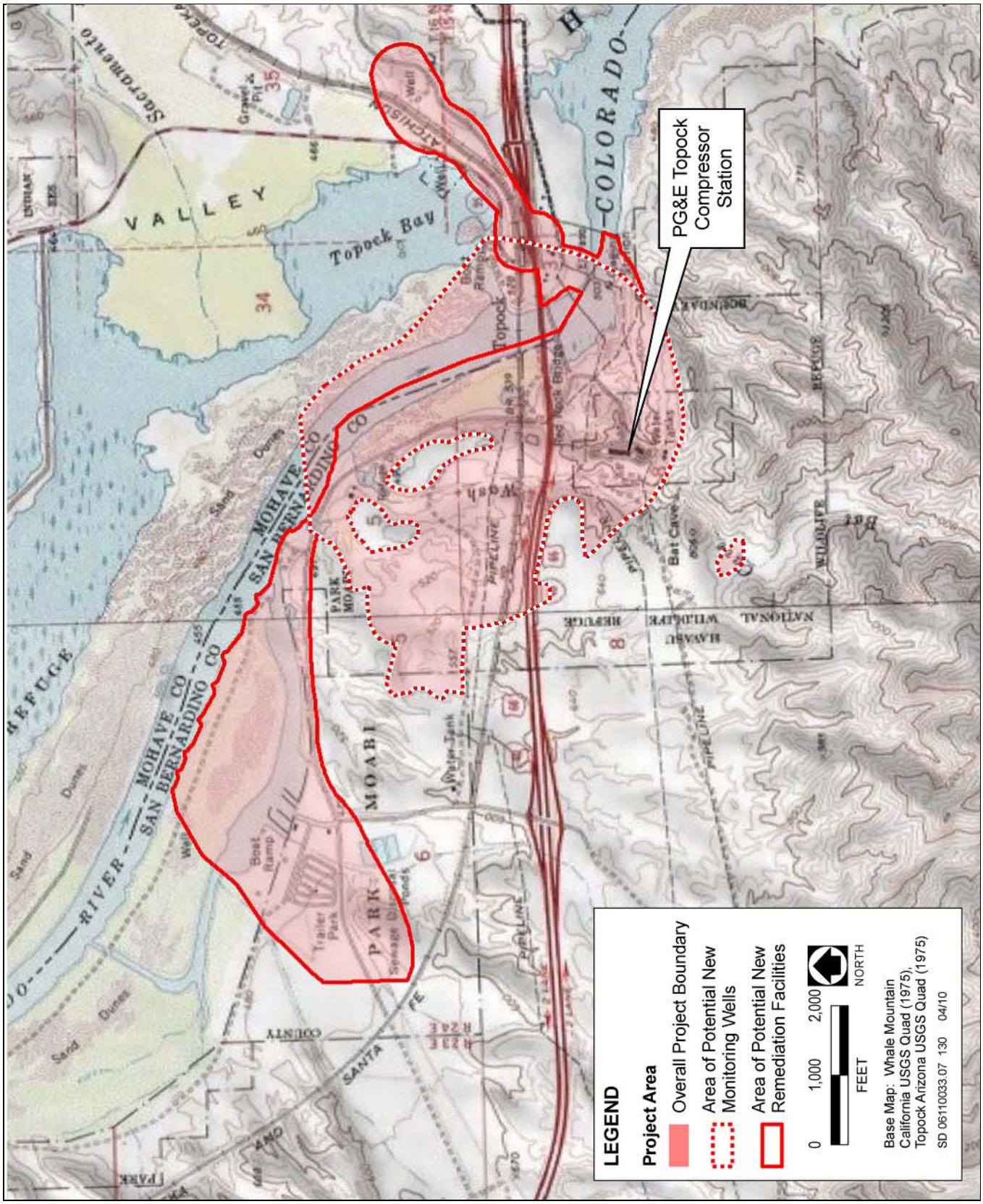
3.4 PROJECT OBJECTIVES

The objectives of this project are defined based on the conclusions of the Ground Water Human Health and Ecological Risk Assessment and identification of applicable or relevant and appropriate requirements (ARARs). The remedial action objectives (RAOs) for the project are intended to provide a general description of the cleanup objectives and to provide the basis for the development of site-specific remediation goals. In accordance with CERCLA guidance, RAOs specify the COPCs, the exposure routes and receptors, and an acceptable contaminant concentration for each exposure pathway (EPA 1988a and 1988b, cited in CH2M Hill 2009:3-7, included in Appendix CMS of this EIR). Protectiveness can be achieved by limiting or eliminating the exposure pathway,



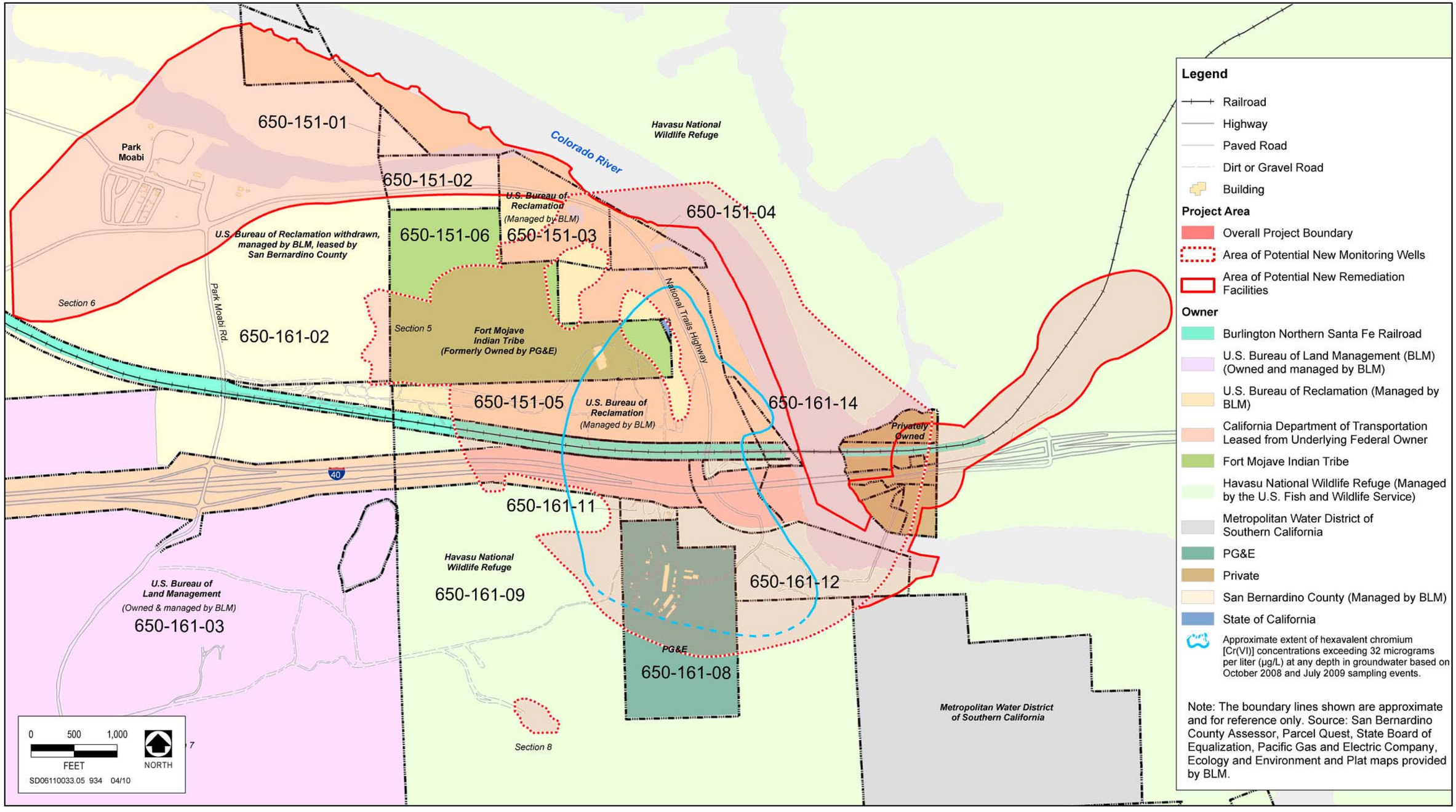
Source: Adapted by AECOM in 2009

Regional Project Location **Exhibit 3-1**



Source: PG&E 2010

Project Vicinity **Exhibit 3-2**



Source: CH2M Hill 2009, adapted by AECOM in 2010

Boundaries of Contaminated Groundwater Plume and Land Ownership/Management **Exhibit 3-3**

reducing or eliminating chemical concentrations, or both. Guidance from the RCRA corrective action describes goals for final cleanup both in terms of protecting human health and the environment as well as performance standards that must also include controlling future sources of releases (EPA 2004, cited in CH2M Hill 2009:3-7, included in Appendix CMS of this EIR). Further, California State Water Board Resolution 92-49 requires the selection of a remedial alternative that would achieve compliance with RAOs within a reasonable timeframe.

The primary objective of the proposed project is to clean up the groundwater contamination related to the historical release of chemicals into Bat Cave Wash and the East Ravine near the compressor station in a manner that would be consistent with all applicable regulatory requirements and to do so within a reasonable period of time when compared between viable alternatives. These objectives establish specific cleanup goals for Cr(VI) and Cr(T), and address the other identified COPCs (molybdenum, selenium, and nitrates) through monitoring and institutional controls. The proposed project RAOs for groundwater are to:

- prevent ingestion of groundwater as a potable water source having Cr(VI) in excess of the regional background concentration of 32 micrograms per liter (µg/l) Cr(VI);
- prevent or minimize migration of Cr(T) and Cr(VI) in groundwater to ensure concentrations in surface waters do not exceed water quality standards that support the designated beneficial uses of the Colorado River [11 µg/l CR(VI)];
- reduce the mass of Cr(T) and Cr(VI) in groundwater at the project area to comply with ARARs,[1] which would be achieved through the cleanup goal of 32 µg/l of Cr(VI); and
- ensure that the geographic location of the target remediation area (contaminated groundwater plume) does not permanently expand following completion of the remedial action.

3.5 DESCRIPTION OF THE PROPOSED PROJECT

This section describes the proposed project, or the final remedy, that would be implemented at the compressor station in order to meet the objectives stated above. This project description is consistent with the description contained in the statement of basis and is based largely on information contained within the Final CMS/FS (CH2M Hill 2009, included in Appendix CMS of this EIR). The Final CMS/FS examined nine remedy alternatives. This project description is based on what is identified in the Final CMS/FS as Alternative E—In Situ Treatment with Freshwater Flushing.

Specifically, the proposed project involves flushing the contaminated groundwater plume through an in situ reactive zone (IRZ) and installing extraction wells near the Colorado River to hydraulically control the plume, accelerate cleanup of the groundwater within the floodplain, and flush the groundwater with elevated Cr(VI) through the IRZ. The proposed project consists of five main elements: (1) an IRZ zone along a portion of National Trails Highway, (2) extraction wells near the Colorado River that would pump approximately 640 gallons per minute (gpm) of contaminated groundwater that would be amended with organic carbon before reinjection in the western end of the plume, (3) approximately 500 gpm of freshwater that would be injected west of the plume to accelerate groundwater flow, (4) institutional controls on groundwater use, and (5) monitoring. The project description is divided into sequential phases of project implementation: construction, operations and maintenance, long-term monitoring, and decommissioning. It is estimated that the duration of these phases is 3 years, 29 years (could be up to 110 years), 10 years, and 2 years, respectively.

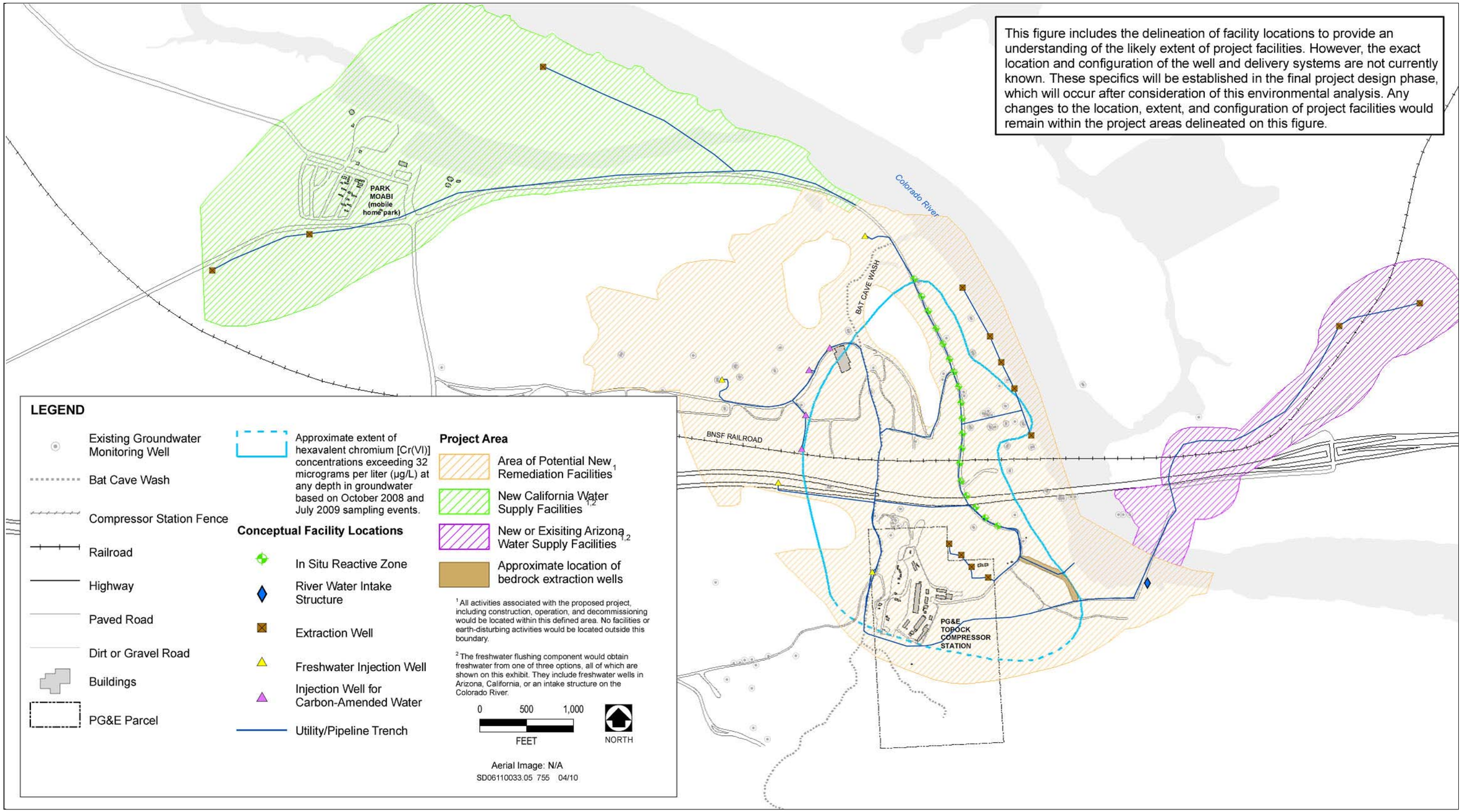
[1] CERCLA Section 121 requires cleanups to meet "ARARs": any "legally applicable or relevant and appropriate standard, requirement, criteria or limitation" that has been promulgated under federal or state environmental laws. The ARARs include such things as the federal and state "Safe Drinking Water Act" and the Solid Waste Control Act's land disposal restrictions.

Because DTSC recognizes that the variable nature of the geologic materials beneath the site may result in some localized areas being resistant to in situ treatment and freshwater flushing, DTSC's preferred alternative includes monitored natural attenuation as a long-term component to address residual Cr(VI) that may remain in portions of the aquifer formation after a majority has been treated by in situ treatment with freshwater flushing monitored natural attenuation relies on the naturally occurring degradation and dilution properties of the groundwater system to change Cr(VI) to Cr(III). Furthermore, because of the heterogeneity of the bedrock, the design of the hydraulic system to control plume migration toward the Colorado River in an area known as the East Ravine may include a series of extraction wells along a portion of the National Trails Highway or within the areas in the East Ravine (see Section 5.3.1 of the Final CMS/FS, which is included as Appendix CMS of this EIR).

Exhibit 3-4 identifies the project area in which all remediation facilities could be located, which includes potential future facilities required for project implementation and where, generally, they are proposed to be sited. Exhibit 3-5 identifies the project area where future monitoring wells could be located. While the remediation and monitoring project boundaries almost entirely overlap, there are some areas where monitoring wells could be located where remediation facilities would not be necessary (such as on the eastern bank of the Colorado River in Arizona) and vice versa. All construction and operation activities would occur primarily within the tan areas identified in these exhibits. These areas would include all remediation and monitoring wells and all necessary infrastructure to support implementation of the proposed project. These areas would also include all areas needed for construction activity and access, such as staging areas. Localized freshwater intake facilities and associated pipelines could be located within the tan, green or purple areas identified in Exhibit 3-4. As displayed in the exhibits, the majority of the facilities are located outside of PG&E-owned property. The ultimate locations, siting, and conditions would be coordinated with the individual landowners and would occur during the subsequent detailed design, construction, and implementation phases.

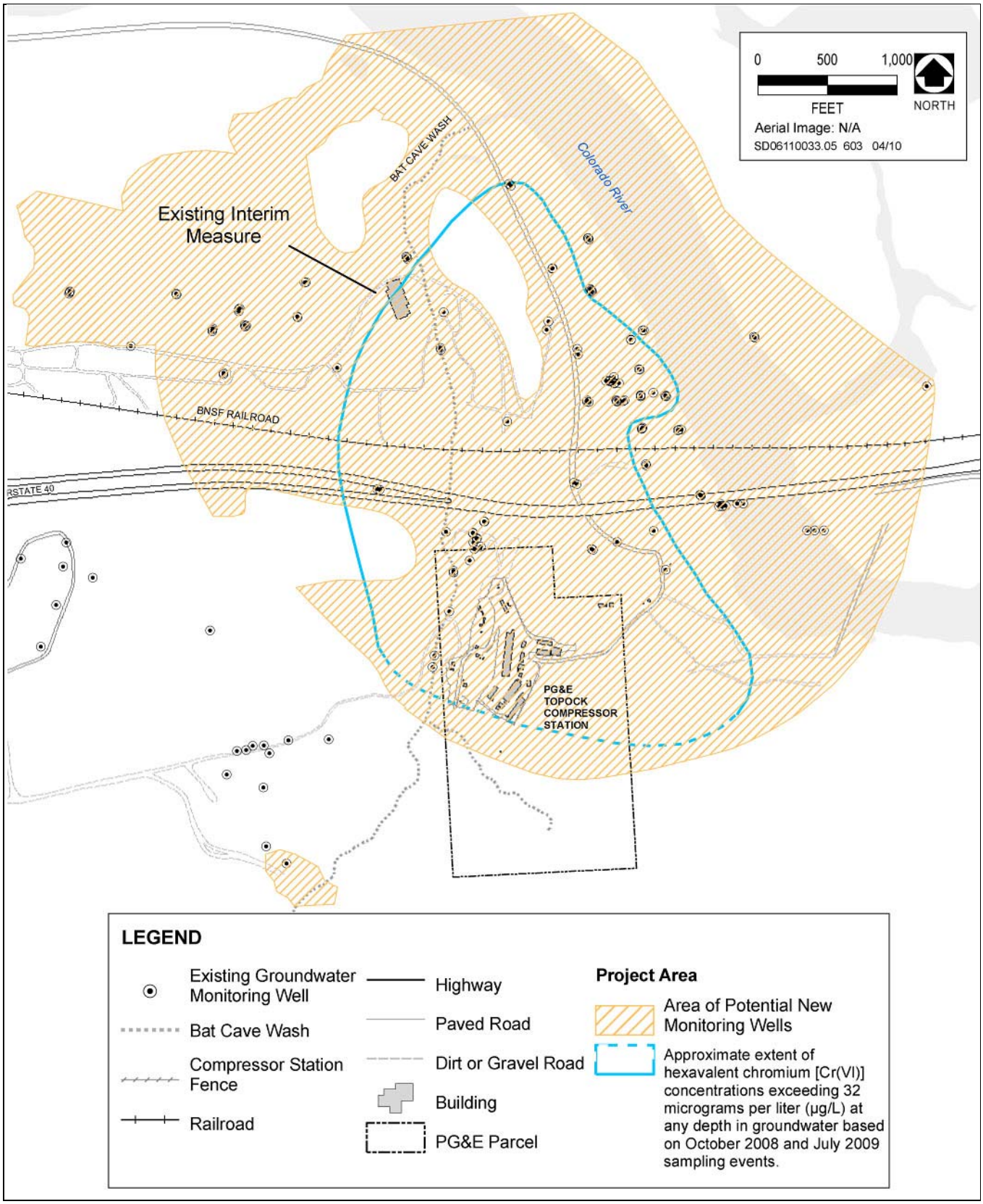
The ultimate number and specific locations of the elements that make up the proposed project (e.g., remediation wells, monitoring wells, pipelines, freshwater intake locations, and associated infrastructure) have not been determined at this time and are dependent on the final remediation system design and changes to the design during construction and implementation. The actual number, location, and configuration of the extraction, treatment, and injection systems and/or changes to the type, method, and configuration of the treatment delivery systems may occur to enhance performance of the remedy to attain the cleanup goals and to respond to site conditions and performance issues. During the project design phase (which would occur subsequent to this EIR and the statement of basis), locations of remedial structures would also be determined through communication and discussions with the landowners and/or other entities with rights-of-way. Remedial structure locations also would be determined in consideration of treatment efficiency, accessibility for construction and operation and maintenance, topography, sensitive cultural and biological resources, and existing infrastructure. The estimated maximum number of new wells that would be installed in the project area considered within this EIR is 170, which includes both remediation and monitoring, but does not include replacement wells that may be necessary during the operation and maintenance phase.

Exhibit 3-4 portrays a conceptual idea of what the distribution of remedy facilities could look like in the project area, including conceptual locations of wells and pipelines. This exhibit is provided for illustrative purposes only, and a greater number of facilities, as described below, could be implemented. Specific elements associated with the proposed project could be located anywhere within the area of potential facility locations. An estimated 60 of the 170 new wells would be monitoring wells (not including replacement wells), and those could be located anywhere within the boundary shown on Exhibit 3-5. Following final design, an assessment of potential environmental impacts would be reviewed to ensure that the impacts would be consistent with the analysis presented in this EIR, or if additional analysis is required.



Source: Compiled by AECOM in 2010, CH2M Hill 2010

Conceptual Layout of Proposed Remediation Facilities **Exhibit 3-4**



Source: CH2MHill 2009

Conceptual Layout of Future Monitoring Wells **Exhibit 3-5**

3.5.1 DESCRIPTION OF PROPOSED PROJECT FEATURES

3.5.1.1 REMEDIATION FACILITIES

The proposed project would involve the in situ treatment of contaminated groundwater. In situ treatment of groundwater refers to the reduction in mass, toxicity, mobility, volume, and/or concentration of COPCs, such as Cr(VI), using treatment technologies that treat groundwater in place, as opposed to pumping and circulating water through a separate treatment plant. In situ treatment would be performed by manipulating the subsurface environment by placing a degradable chemical compound (termed a "reductant") to create reducing conditions to convert Cr(VI) in groundwater to the relatively insoluble trivalent chromium [Cr(III)]. The reduced chromium would precipitate or become adsorbed onto aquifer solids. In situ treatment would occur by injecting a reductant solution below the ground surface. Reductants used could be organic carbon substrates (such as ethanol) that promote biochemical processes that reduce Cr(VI) to Cr(III), inorganic reagents such as calcium polysulfide that react directly to reduce Cr(VI), or commercially available compounds designed for in situ remediation. Reductants are typically mixed on-site with a water source, such as extracted contaminated groundwater, prior to injection.

The in situ treatment would include installing remediation wells that would generally consist of extraction and injection wells and an IRZ that would comprise both. The anticipated cleanup action would include a maximum of 110 remediation wells, as well as the replacement of wells that may be necessary during the operation and maintenance phase. The actual number, location, and configuration of the extraction, treatment, and injection systems and/or changes to the type, method, and configuration of the treatment delivery systems may occur over time to enhance performance of the remedy to attain the cleanup goals and to respond to site conditions and performance issues. It is anticipated that approximately 50% of remediation wells would be located in what is known as the floodplain area (along the Colorado River, or eastern part of the project area), with the remaining wells located within the upland areas (western part of project area), and bedrock areas (southern part of project area). A brief description of the types of remediation wells is provided below.

IRZ Wells

The IRZ portion of the proposed project would create a treatment zone where groundwater would be extracted and injected, and would therefore include both injection and extraction wells. The IRZ would be constructed using a series of wells that could be used either as injection or extraction wells to circulate groundwater and distribute the reductant. The water with the reductant would be injected under pressure into the aquifer using a network of wells to form the treatment zone. The IRZ is expected to be located along a portion of National Trails Highway, as conceptually illustrated in Exhibit 3-4.

The IRZ portion of the proposed project would include new wells that could be located in the floodplain, alluvium, or bedrock portions of the plume, and is expected to be located along a portion of National Trails Highway. IRZ well vaults (the above ground area that would be disturbed and visible) would be approximately 6 feet long by 8 feet wide. Well vaults would extend approximately 8 feet below the surface. The vaults would likely be constructed flush with the ground surface to the extent feasible (Exhibit 3-6). For those that are not flush with the ground, steel posts (bollards) may be installed around the wells for protection (e.g., from vehicle traffic). Wells could range from 4-inch diameter polyvinyl chloride (PVC) and stainless steel to 12-inch diameter stainless steel. There are numerous potential arrangements of wells and injection schemes that could be used in the in situ portion of the proposed project, and the proposed project could include direct injection schemes and/or recirculation well systems. Not all new wells would need to be constructed at the outset of the remedy, but could be constructed as needed during the operation and maintenance period to optimize the cleanup process.

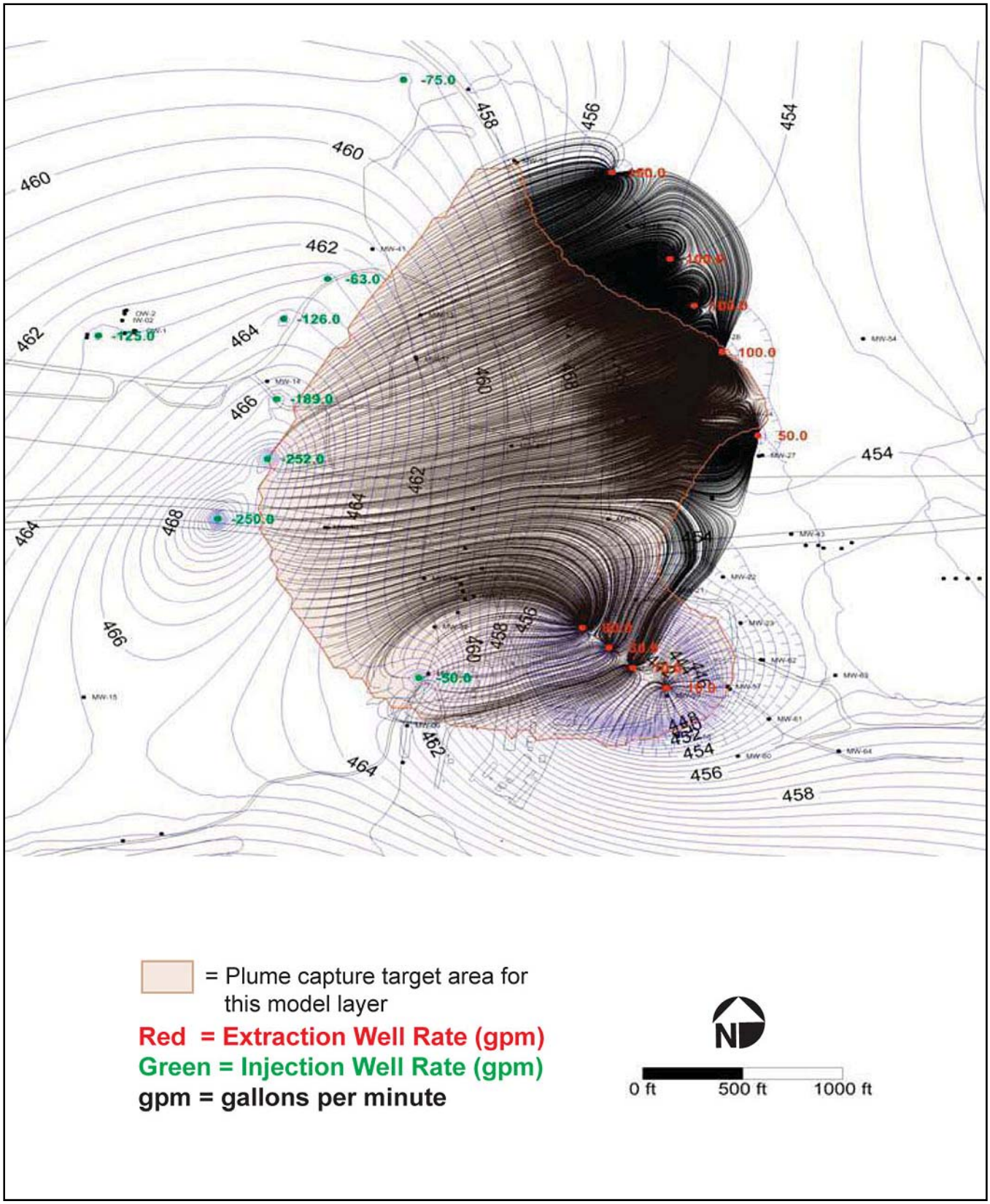
Source: Photo taken by PG&E in 2010

Typical Flush Mounted IRZ Well **Exhibit 3-6**

Extraction and Injection Wells

Extraction wells would likely be located near the Colorado River to provide hydraulic control to prevent contaminated water from reaching the river. Extraction near the river would also help to draw carbon-amended water a portion of the way across the floodplain to treat the existing Cr(VI) in the alluvial zone of the floodplain aquifer east of National Trails Highway. Additional extraction wells would also likely be located in an area known as the East Ravine, which is in the southeast portion of the project area. Exhibit 3-7 shows the projected downstream flow lines associated with the proposed project. The extracted water would be amended with carbon substrate or other reductants and reinjected in the western portion of the plume where it would help induce a hydraulic gradient to accelerate the movement of the groundwater through the IRZ, where it would be treated. To further accelerate the movement of the contaminated groundwater toward reducing zones and to enhance the distribution of the reductants, additional injection wells would likely be constructed in areas to the west and north of the plume. The injection of freshwater to further accelerate the remediation process is expected to occur within the southern part of the plume for freshwater injection, as described in more detail below.

The assumed flow rate of groundwater extracted from the extraction wells, amended with carbon substrate and reinjected, is approximately 640 gpm. The primary purpose of adding carbon to the injected water would be to create treatment zones near each injection well where any Cr(VI) in the injected water would be reduced. Typical well vaults for injection/extraction wells could be as large as 6 feet long by 8 feet wide by 8 feet deep. The range



Source: CH2M Hill 2009

Projected Downstream Flow Lines of the Plume **Exhibit 3-7**

of well size would be between 4 and 12 inches in diameter. As discussed for IRZ wells, not all new extraction and injection wells would need to be constructed at the outset of the remedy, but could be constructed as needed during the operation and maintenance period to optimize the cleanup process.

Reductant Storage and Associated Facilities

Up to 240,000 gallons per year of reductant chemicals would be used for the remediation. The reductant for the in situ portion of the proposed project would be stored in aboveground tanks, which would be located within the defined project area shown in Exhibit 3-4, ideally near the injection wells for efficient management of the material. Other likely locations for reductant storage facilities are at the compressor station, existing monitoring well 20 bench (MW-20 bench), which is adjacent to the east side of National Trails Highway in the project area (see Exhibit 1-1), or near the existing IM-3 Facility. The maximum footprint of the area in which the tanks, control buildings, and associated equipment would be located is estimated to be a maximum of 35,000 square feet, which may consist of facilities at multiple locations. Tanks and equipment may be located within a permanent enclosed structure. Alternatively, final design of the project may be based on a mobile delivery system involving a central reductant storage area with one or more concrete or steel tanks built in the project area, ideally at the compressor station within the existing fence line. The tanks would be sized for the demand and are expected to have a storage capacity of up to 100,000 gallons. If multiple tanks are necessary, each tank would be approximately 12 feet wide, 24 feet long, and up to 15 feet tall, with a capacity of 24,000 gallons. The storage or delivery areas would have fencing and lighting for safety and security purposes.

3.5.1.2 FRESHWATER FLUSHING

Freshwater flushing involves using injection wells to introduce clean water to the aquifer. These injection wells may be located beyond the margin of the plume (but within the defined project area shown in Exhibit 3-4) and would contribute to flushing groundwater through the IRZ. These injection wells may be located in bedrock or along the leading edges of the plume to control movement of groundwater. The injection of freshwater at an assumed rated of approximately 500 gpm would induce a hydraulic gradient to accelerate the movement of the contaminated groundwater through the IRZ, where it would be treated. In addition to the 500 gpm of freshwater, 640 gpm of treated groundwater extracted from the plume would be reinjected. This combined freshwater and treated groundwater injection would also serve to constrain westward movement of the carbon amended water from the IRZ and flush much of this water eastward toward the extraction wells.

Freshwater injection would involve piping water in from an off-site source. Currently, the compressor station receives freshwater from two wells located on the Arizona side of the Colorado River through a Lower Colorado Water Supply Project subcontract with the City of Needles. The water is pumped across the Colorado River through piping mounted on a bridge and then through an aboveground pipeline to two aboveground water tanks located south of the compressor station, where it is stored for use in the operation of the compressor station on an as-needed basis. Freshwater for the flushing portion of the proposed project would come from PG&E's existing Lower Colorado Water Supply Subcontract entitlements and would be pumped either from new or existing Arizona wells, from new wells in California north of the compressor station, or from a new surface water intake at or near the Colorado River (as shown in Exhibit 3-4). Freshwater would be transported by pipeline to injection wells located north, west, and/or south of the plume. Any water pipelines that may be needed to deliver water from freshwater wells and which may extend through or adjacent to the communities of Moabi Regional Park and Topock would be built underground and primarily within existing utility corridors or roadways. The source of freshwater may change during the operation and maintenance period of the remedy; not all freshwater supply structures (wells, intakes, pipelines) would need to be constructed at the outset of the remedy, but could be constructed as needed during the operation and maintenance period. To accommodate the flow volume that would be required for remediation, new pipelines would likely need to be constructed connecting the water supply with the injection wells.

All off-site freshwater delivered to the site may need to be adjusted to match the water quality at the injection point to prevent water fouling. This could require minor pH adjustments to make the water chemically compatible

with the aquifer where it would be injected and to prevent scaling in the injection wells. If needed, this pH adjustment would require a small system with equipment such as a chemical storage tank(s), secondary containment, a feed pump, and a security enclosure such as a building or fence. If surface water from the Colorado River is used, a surface water intake would typically consist of belowground perforated or solid pipes or rectangular channels extending into the river, or an alternative approach is to install pumps below the river surface with riser pipes extending to a concrete and steel platform. If surface water from the Colorado River is the source of water for flushing, filtration may be needed to remove sediment and bacteria (for injection well maintenance). Water treatment facilities that would be needed for this purpose would likely be housed in one or two buildings that would be most likely located on the lower plateau of the compressor station, but could be located anywhere within the defined project area. Freshwater treatment systems, such as tanks and buildings, would be a maximum of 10,000 square feet and 25 feet tall, with an overall footprint of up to 40,000 square feet.

The factors influencing the number and location of injection wells for efficient flushing using freshwater depend on remedial system flow rates and aquifer capacity. Injection wells would typically be located outside the plume boundaries in an upgradient direction. In order to deliver the freshwater to the injection wells, a piping system would also be required. This piping system could either be above- or belowground, and its ultimate location would depend on the final design, landownership, environmental conditions, safety, and feasibility. A conceptual route for piping associated with freshwater flushing is shown in Exhibit 3-4.

3.5.1.3 MONITORING WELLS

Approximately 100 monitoring wells currently exist near the compressor station. These wells were used to collect groundwater samples during completion of the RCRA facility investigation/remedial investigation, and are also used for performance monitoring of the IM. Additional groundwater monitoring wells may be installed as part of the proposed project to further evaluate site conditions, monitor contaminant levels, and to assess the performance of the remediation system. Additional monitoring wells would be strategically placed to assess contaminant levels of groundwater and progress of in situ treatment and freshwater flushing. Monitoring would include the collection, management, and reporting of groundwater quality, surface water quality, and operational data from the remedial system. In addition to using existing and future wells, monitoring would continue to include periodic sampling and analysis of surface water or pore water in the Colorado River. Monitoring would be required during the operation and maintenance phase and for an estimated 10 years following completion of the remedy.

A maximum of 60 new additional monitoring wells are anticipated as part of the proposed project, and these wells could be located anywhere in the boundary shown on Exhibit 3-5. In addition, monitoring wells could be replaced throughout the operation and monitoring phase, as necessary. Monitoring wells are typically between 4 and 8 inches in diameter and are completed at the ground surface with a concrete pad (typically 4 square feet) and include a manhole-type cover to the well (Exhibit 3-8). Where a ground surface completion is not feasible, monitoring wells may be installed with aboveground completion with steel protective casing. Monitoring wells would be situated in areas that provide relevant data on groundwater hydraulics and chemistry. In the interior of the plume, monitoring wells would provide data on the operation of the in situ remediation systems. These wells would monitor the changes in water levels and water quality in the active part of the remediation system. Around the perimeter of the plume, monitoring wells are usually installed for compliance monitoring or as “sentry” wells just outside of the contaminated area. Monitoring wells would be sited with consideration of available access, existing infrastructures including transportation and pipeline corridors, sensitive areas, and property owners.

Monitoring of the groundwater wells in the project area is anticipated to occur on a quarterly or more frequent basis initially and would likely be reduced to a semiannual or less frequent basis in later stages of remediation. The specific number and location of additional monitoring wells would depend on the location of remedial facilities and the rate of progress to attain remedial action goals. Not all new monitoring wells would need to be constructed at the outset of the remedy, but could be constructed as needed during the operational life of the proposed project. As the remediation progresses and the plume changes in size and shape, monitoring wells may

need to be decommissioned or additional monitoring wells may need to be installed in order to provide adequate data for control and optimization of the remedy.

Source: Photograph taken by AECOM in 2008

Typical Groundwater Monitoring Well Vault at the Topock Compressor Station **Exhibit 3-8**

3.5.1.4 WATER CONVEYANCE, UTILITIES, AND ROADWAYS

The proposed project would require pipelines to transfer freshwater, treated water, and reductant-amended water throughout the treatment area. It would also require other utility connections such as electrical power, signal communications, and natural gas. Where underground pipelines or utilities are determined most appropriate, trenches would be excavated to depths of 3 to 4 feet, buried, and covered to match the surrounding area, whether it is soil or pavement.

Locations of utilities and water conveyance structures would depend on the ultimate placement of monitoring and treatment facilities. A conceptual footprint of water conveyance systems and utilities for illustrative purposes is shown in Exhibit 3-4. Main infrastructure corridors would be sited coincident with existing utility and transportation corridors where possible; north-south main alignments are expected to utilize existing crossings of the freeway and railroad (e.g., at National Trails Highway, through the Bat Cave Wash culvert), and east-west main connections are expected to follow alignments of existing roads (I-40, railroad, Historic Route 66, gas pipeline maintenance roads) to the extent feasible. Other pipelines would be constructed between the main corridors and the well locations. Final locations of pipelines would be determined based on communication and discussion with landowners and/or other entities with rights-of-way. Final locations would also be determined in consideration of well locations, topography, sensitive cultural and biological resources, landownership, and existing infrastructure.

Depending on required service life, security and access, landowner requirements, type of pipeline, and environmental constraints (such as the subsurface geologic features or cultural resources), pipelines could be installed aboveground or belowground. The diameter of pipelines would vary from 1 to 14 inches, depending on the specific utility and required flow rate. Trenching would vary according to the size of pipeline and electrical conduit needed, as follows: 1.5-foot-wide trench for 1- to 4-inch piping, 3-foot-wide trench for 6- to 12-inch piping, and 5-foot-wide trench for 12- to 14-inch piping. Pipe access points and air-release valves may be constructed inside underground or aboveground concrete vaults that may be surrounded by protective bollards. An estimated maximum of 50,000 linear feet of pipeline may be required to serve the proposed project. Electric utility access vaults (with protective bollards) or power poles would likely be placed at selected points along the pipelines.

Electric conduit and cable would be installed to supply communication and power to pumps and instrumentation and would typically be installed underground in the same location as piping. Wherever feasible, trenches would be dug to place utility connections underground, which would reduce wear from weather and vandalism. As with pipelines, a maximum of 50,000 linear feet of electrical and signal communications is expected to be required for project implementation. Wireless transmitters and receivers, like cellular or radio devices, may be used to communicate to remote areas that have little power demand, thereby reducing the amount of trenching required to install communications-related equipment. Small solar panels may be installed to provide supplemental power, or as a primary power source for a lower power demand, such as for instrumentation and communication systems (Exhibit 3-9). Using solar panels would minimize the need for conduit and pipeline to serve the electrical demands of smaller ancillary facilities.

A road network for accessing the existing network of monitoring wells runs throughout the project area. This road network would be used where feasible for construction and operation of the proposed project; however, additional roads would be required. A maximum of 6,000 linear feet of new roads could be needed throughout the project area, for both construction and long-term operation and maintenance of the proposed project. An access road would be required to provide service to each well. At some wells, a vehicle turnaround would be required. For wells where a turnaround is needed, the final disturbed area at each wellhead would be approximately 3,000 square feet. For wells located along an access road where no turnaround is needed, the disturbed area would be approximately 1,000 square feet. Access roads would be graded to create a smooth surface and proper drainage and would be routed with topographical and built structures and would consider sensitive natural resources. The roads would be maintained throughout the operation and maintenance period of the proposed project. Depending on their location, condition, frequency of use, and purpose, roads may be paved with asphalt, covered in gravel, or left unpaved. Following determination that the remedial or monitoring structure is no longer needed, the road would be closed and restored to preproject conditions.

3.5.1.5 INSTITUTIONAL CONTROLS

Institutional controls are non-engineering mechanisms, such as legal or contractual restrictions on property use, which are used to help minimize the potential for human exposure to contamination and/or protect the integrity of a remedy. Institutional controls would be authorized by PG&E and can be imposed by agencies (such as DTSC). Institutional controls work by limiting land or resource use and/or by providing information that helps modify or guide human behavior at a site. Some common examples of institutional controls include zoning restrictions, building or excavation permits, prohibitions on well drilling, and easements and covenants. Institutional controls are determined based on the specific conditions at a site and may be temporary or permanent. Institutional controls would likely consist of restrictions against development of the groundwater as a potable water supply during the cleanup period and restrictions against removal of or damage to remedial structures (e.g., wells, pipelines, tanks) during the cleanup period. Maintaining institutional controls would not require any physical disturbance in the project area.

Source: Photograph taken by AECOM in 2008

Example of Solar Panel That May Be Used in the Final Remedy **Exhibit 3-9**

3.5.2 DESCRIPTION OF CONSTRUCTION ACTIVITIES

3.5.2.1 GENERAL OVERVIEW OF CONSTRUCTION ACTIVITIES

Construction of the proposed project would occur during an estimated 4 years: 3 years for constructing the remediation facilities at the onset of the proposed project and 1 year for decommissioning of the existing IM-3 Facility after final remedy is considered operating properly and successfully. The length of time required for construction is dependent on a number of factors, including the number of wells, pipelines, and other infrastructure, the geologic conditions encountered during well installation, the time required for regulatory and landowner approvals, and the availability of construction labor and materials at the time of construction. Construction would be limited to daylight hours to minimize the need for lighting and to conserve energy to the extent practical; however, some nighttime construction efforts may be required. For example, nighttime construction activity could be required for the continuous drilling of large-diameter wells. Staging areas would be located to the extent feasible in areas that are already developed or disturbed, such as within the fenced and developed areas at the compressor station. However, staging could also be located elsewhere within the project area identified on Exhibit 3-4.

In general, construction activities would include the mobilization of equipment, supplies, and workers to and from the project area. Construction workers would be present on-site each day throughout the duration of construction. Heavy equipment would likely include drill rigs to install remediation wells, trucks and excavators or backhoes to lay the pipeline network, and cranes to place control sheds and reductant storage tanks. Trucks would be necessary for making deliveries and hauling waste from the site. Table 3-1 shows the total amounts of cubic yards of soil that is expected to be disturbed during construction.

Table 3-1
Soil Disturbance in the Project Area

Location within the Project Area	Volume of Soil Disturbance (cubic yards)
Floodplain	3,400
Bat Cave Wash	1,400
Roadways	4,600
Undisturbed areas	2,100
IRZ reagent storage tank	1,000
Well installation	900
TOTAL	**13,400**

Note: IRZ = in situ reactive zone.
Source: Data provided by Pacific Gas and Electric Company in 2010

Drinking water to be used by personnel during construction would consist of bottled water purchased by contractors from off-site sources. Water for other uses during construction activity (e.g. for dust suppression) would be trucked within the project area from the existing water tanks at the compressor station to other locations in the project area. The maximum amount of water used during construction would be 9.2 acre feet. Tanks, bins, or tanker trucks would likely be used to contain excess water and drill cuttings (e.g., the fragments of rock and soil that are removed to create the borehole) at the drill site and at designated staging areas. Staging areas would most typically be located in areas that are already developed or disturbed, such as within the fenced and developed areas at the compressor station. However, staging could also be located anywhere within the project area identified on Exhibit 3-4. Construction practices will be designed to limit dust, noise, and nighttime light generation where feasible. During the detailed design process, specifications to conserve energy, minimize carbon footprint, utilize alternative fuels and energy sources, minimize waste, and use recycled or sustainably produced materials will be identified. Details regarding the construction activities for the main elements of the project are provided below.

3.5.2.2 CONSTRUCTION OF WELLS

Remediation and monitoring wells could be installed either using conventional truck-mounted drilling equipment or all-terrain capable equipment. Exhibit 3-10 shows a typical drill rig for the installation of a monitoring well. The sonic drilling method has proven to be effective for monitoring wells and could be used for smaller-diameter extraction and injection wells. Wells that would be located within the bedrock area may involve diamond coring or air rotary drilling methods in conjunction with sonic or rotary methods for setting surface casing. For wells greater than 4 inches in diameter, mud rotary drilling methods would likely be used. Large diameters are needed for large capacity wells, both to increase the yield of the well and to accommodate the larger pumps needed to lift higher volumes of water from the well. Sonic drilling methods would be used for construction of 4-inch-diameter or smaller diameter wells to the depths necessary to reach bedrock at much of the project area. Tanks, bins, or tanker trucks would likely be used to contain excess water and drill cuttings at the drill site and at designated staging areas.

Source: Photograph taken by AECOM in 2008

Track-Mounted Rotosonic Drill Rig and Support Vehicle Used for Locations with Difficult Access **Exhibit 3-10**

Based on the activities that have occurred to date in the project area during installation of similar wells, the length of time required to construct the injection and extraction wells would be approximately 1 day to 5 weeks per well, depending on the diameter and depth of the well. Small diameter, shallow monitoring wells may be constructed in 1 or 2 days. Large-diameter extraction or injection wells to depths of up to 500 feet may require several weeks to construct and develop. The area surrounding each borehole that may be disturbed, including temporary equipment lay down areas, during drilling is estimated to be up to one-half acre. There are some situations where a particular borehole could require grading up to the one-half acre; however, grading is not typically required for existing wells. The boreholes would typically be drilled out to a maximum diameter of approximately 24 inches and to a maximum depth of 500 feet below ground surface (thus requiring the same drilling equipment during installation

activities). If drilling occurs at night, generators and temporary light plants may be employed to provide safe working conditions. Continuous drilling, including nighttime drilling, may be necessary for construction of large diameter wells drilled using mud rotary methods. Drilling operations for a larger extraction or injection well could require up to several continuous weeks of work to complete.

To support the drilling rig, a support truck, a forklift, and one or more pickup trucks may be used to transport personnel, equipment, and materials from staging areas to the drill site. The forklift would also be used to transport cuttings and excess core generated from drilling the soil borings to lined, steel roll-off soil bins that would be temporarily staged. The number and size of staging areas and number of tanks and roll off bins would vary depending on how many wells are installed, the size of the wells, the drilling method used, and how quickly construction is required to proceed. Up to four 20,000 gallon tanks and four to six roll-off bins might be required for large-diameter deep wells.

Standard practices, such as use of plastic sheeting over the ground surface, would be employed in the drilling and staging areas as necessary to keep the drilling materials and equipment clean and to minimize contact of the drilling materials and equipment with the ground surface. Materials to be temporarily stored at the well sites may include drilling equipment and well construction materials (e.g., casing, sand, bentonite, and grout). Additional supplies and equipment not in use would be stored at the compressor station, near the core storage area, or within the already developed or disturbed areas within the project area. Drilling and well installation activities would conform to state and local regulations.

Several types of waste materials would be generated during the drilling, development, and sampling of the wells. Investigation-derived waste materials that would likely be generated include groundwater, drill cuttings, and incidental trash. Water generated during drilling, development, and testing activities would be stored temporarily in bins or portable storage tanks with maximum capacities of 20,000 gallons. These tanks would be located temporarily near the drilling sites. Secondary containment would be setup at the drilling area for the portable storage tanks or bins. After characterization, water generated from the well installation activities would likely be processed on-site at the IM-3 treatment facility and reinjected into the aquifer or transported off-site for processing to an appropriate waste receiving facility. Based on disposal activities conducted to date at the compressor station, the off-site facility likely would be in the Phoenix or Los Angeles areas. Drill cuttings from well installation would typically be contained in lined roll-off bins at the well sites or in an investigation-derived waste staging area during the drilling and sampling activities. After sampling and characterization, bins with contaminated soils would be removed from the investigation-derived waste staging area using heavy trucks and transported for disposal in a permitted off-site hazardous waste disposal facility (e.g., CWM Kettleman Hills Landfill located outside of Kettleman City, in Kings County, California or a similar facility such as Clean Harbors Buttonwillow Landfill in Buttonwillow, California). Any unregulated drill cuttings (i.e., cuttings that would not be considered hazardous, pose a significant risk to ecological or human receptors, or require disposal at a hazardous waste facility) would likely be stockpiled at the compressor station (within the fenced boundary) or at the treatment plant for later reuse on-site, if suitable. It is estimated that the soil investigation-derived waste bins temporarily staged at a drill site would not remain in excess of 45 days.

Nonhazardous incidental wastes from installation of wells, such as trash (e.g., gloves, disposable clothing, food waste) and any cleared vegetation, (estimated to be approximately 5 cubic yards per day) would typically be collected at the end of each drilling shift and either hauled off the drill site at the end of the day or placed in dumpsters or roll-off bins that would be hauled off-site periodically by truck to an appropriately permitted municipal solid waste or recycling facility located within approximately 200 miles of the site.

Well installation would also include pump testing that involves longer-term pumping of the well to measure aquifer properties and well capacity. Water generated from the testing would be temporarily stored and appropriately managed, either on-site or off-site, as noted above.

3.5.2.3 CONSTRUCTION OF WATER CONVEYANCE, UTILITIES, AND ROADWAYS

Utilities and water conveyance pipelines would likely be constructed using standard construction methods and may need to be constructed beneath or around existing structures such as I-40, railroad tracks, and/or existing pipelines. For pipelines that would cross I-40 or railroad tracks at grade, trenchless construction techniques would likely be used. A typical method is to dig a pit to a depth matching the pipeline design depth. A drilling machine equipped with an auger is placed in the pit. The drilling auger can be directed as required to avoid obstructions. The auger is used to drill a hole horizontally across the crossing area. A steel casing pipe is then installed in the hole created by the auger to keep it open. After the hole is completed, the utility piping is installed in the casing. Next the drilling machine is removed and the pit is backfilled following completion of the crossing. The size of the drilling pit depends on the size of the casing installed but could be up to 50 feet long by 20 feet wide. This is a maximum estimate that would be for activities such as bore and jack operations to extend pipelines under roadways. Soil excavated during the trenching process would be placed adjacent to the trench and would occupy an area approximately 10 feet wide on either side of the trench. The areas necessary for trenching and stockpiling are within the footprint boundaries shown on Exhibit 3-4. For digging and backfilling conventional trenches, typical equipment would include backhoes and excavators. Trucks would be used for hauling fill and pipe bedding materials.

Depending on the location of extraction, treatment, and injection facilities, additional access routes could be constructed, or existing roads improved to support the level of activities proposed. The length of new or improved roads is estimated to be up to 6,000 linear feet. Locations of new or improved roads would be within the boundaries of the facility locations shown in Exhibit 3-4, and would be designed to minimize grading and disturbance of sensitive resources and existing structures and to maximize the use of existing roads. Typical road design and construction involves topographic surveying, grading, installing surface drainage systems (culverts, gutters, and riprap for slope protection), and constructing retaining walls.

Existing infrastructure within the project area includes natural gas pipelines, equipment, and pipeline bridges; the BNSF railroad tracks; I-40; overhead and underground telecommunications and power cables; and San Bernardino County roads. In addition, groundwater wells and interim measure structures associated with the remedial activities exist in the area. Appropriate measures would be taken during construction to protect the existing infrastructure. For example, it may be necessary to place a temporary earthen berm or other protective structure over buried natural gas pipelines to allow the safe passage of heavy vehicles across them. Other measures to protect existing infrastructure may be required by future easement agreements for construction with the BNSF, California Department of Transportation, San Bernardino County, and pipeline and utility companies.

3.5.2.4 CONSTRUCTION OF REDUCTANT STORAGE AND ASSOCIATED FACILITIES

Construction of facilities required for reductant storage and delivery would likely require the following elements, depending on the carbon substrate selected for the remedy. Typical construction equipment described above would be used for these facilities as well. These facilities, as well as all construction staging areas, would be located within the project area shown in Exhibit 3-4.

- Dual containment.
- Mojave Desert Air Quality Management District-compliant venting and recovery system (if storing a volatile carbon substrate).
- Dual containment conveyance lines if product is greater than 1% solution strength.
- Electric system to power pumps.
- Mechanical pumps.

- Valves and control/metering devices.
- Instrumentation and controls.
- Civil engineering structures such as foundations, concrete pads, and earthen berms.
- Field trailer and on-site laboratory.

3.5.2.5 CONSTRUCTION OF THE FRESHWATER FLUSHING ELEMENT

Freshwater could be obtained and delivered for the proposed project from wells in Arizona (similar to existing wells that are used to deliver water to the compressor station), wells in California, or surface water from the Colorado River. If a well is determined the most appropriate method for obtaining freshwater for flushing, wells would be drilled in the typical method for drilling wells as described above.

Should a river intake approach be used, the intake would consist typically of belowground perforated or solid pipes (or rectangular channels) extending into the river. The pipes may be fitted with one or more fixed or moving screens to prevent large objects (e.g., refuse) or fish from entering the intake. The intake pipes lead to pumps that push the water to the desired location. The intake pipes are often installed by excavating soil to the desired depth. Reinforced concrete is often used to support the pipes. Because the intake pipes are usually installed below the water table, dewatering is necessary to allow for safe construction. Dewatering can be accomplished by pumping or installing sheet piles or cofferdams. Cofferdams are made of wooden, steel, or concrete sheets that act as temporary barriers to water flow or are installed in submerged areas and allow construction to occur under drier conditions.

An alternative approach is to install pumps below the river surface with riser pipes extending to a concrete and steel platform. The pumps would be fitted with trash and fish screens. The pump motors, air compressors, monitoring and control equipment, equipment hoists, and an operator's structure would be installed on the platform. The platform would be supported by pylons or piers drilled into bedrock beneath the river bottom or mounted on the existing pipe bridge structure. The area of the platform would be from 2,000 to 10,000 square feet, and could be accessed by boat or by vehicles.

As described above, pipelines that would deliver the freshwater could be installed above or belowground depending on the required service life, security and access needs, ground disturbance considerations, and type of pipeline. The diameter of pipelines is estimated to vary between 1 inch and 2 feet. Air release valves would typically be constructed inside underground concrete vaults surrounded by protective bollards. If water is supplied from wells in Arizona, it is likely that piping would run adjacent to existing water pipes that deliver water to the compressor station. These pipes run along the existing bridge over the Colorado River.

Utilities and pipelines might need to cross the Colorado River if the freshwater intake wells are located near the Moabi County Park or in Arizona. In this case, the directional drilling techniques or trenchless construction techniques described above may be employed and/or upgrades to existing pipeline bridges may be necessary.

3.5.3 OPERATION AND MAINTENANCE OF THE PROPOSED PROJECT

Operation and maintenance of the proposed project would occur during the entire period in which cleanup activities would be ongoing and until the cleanup goals defined in the objectives have been met. The cleanup goal has been defined as the regional background level of 32 µg/l of Cr(VI). Depending on the performance of the proposed project, the operation and maintenance phase for the proposed project is estimated to take up to 110 years; however, detailed modeling and analysis contained within the Final CMS/FS shows that a more likely time frame is approximately 29 years (CH2M Hill 2009, included in Appendix CMS of this EIR). In addition, after cleanup goals are attained, an additional 10 years of monitoring would occur. Any specific issues with the remedy

noted during the operation and maintenance phase would be documented by PG&E in a periodic operation and maintenance report to be submitted to DTSC. If reporting identifies parameters that differ significantly from the approved operation and/or design of the "remediation system" as outlined in the operation and maintenance plan or the remedial design, PG&E shall notify DTSC and shall discuss any proposed changes to the operation or design with DTSC. Based on DTSC review, if the changes are necessary and beyond the scope of an administrative change (e.g. changing the monitoring date from one month to another, or reducing flow rate with no design modifications), then DTSC would evaluate the change for CEQA significance. DTSC would then either agree with the change through a finding of CEQA compliance or propose a change through EIR addendum. DTSC may also elect to reject the proposed change and require PG&E to continue operation and maintenance as specified in the operation and maintenance plan and design until the 5-year review for comprehensive remedy evaluation.

Operation and maintenance of the proposed project would require one operator on-site for 5 days per week and one operator on-site for 3 days per week, annually throughout the life of the project (up to 110 years, more likely 29). Operation would also include three site managers 5 days per week, and seven workers on-site for 4 weeks per year for sampling and maintaining the monitoring well network. Additional trips that would be required throughout the duration of operation and maintenance include the following:

- 100 vehicles per year for regular maintenance,
- up to 10 additional vehicles per year for nonroutine maintenance,
- 1 pump rig for 1 to 4 months per year for well maintenance,
- 10 delivery trucks or sampling vehicles per monitoring event, and
- 3 passenger vehicles (15 trips per week) for site management.

Key operation and maintenance activities for the proposed project would primarily include periodic well maintenance, refinement of the injection/recirculation systems, management of the reductants, equipment maintenance and inspections, performance testing, periodic water supply quality testing, and periodic replacement of wells and other structures that become clogged or damaged. Injection wells typically involve more maintenance than extraction or monitoring wells. The maintenance activities typically involve use of pump service trucks to lift pipes and pumps out of the wells and lower cleaning tools into the wells. Tanker trucks and/or temporary storage tanks are needed to contain the water generated during well maintenance. In some cases, acid or other chemicals may be placed in the well to assist in removing mineral scale or biological growth. The frequency of maintenance activities may be as often as every few months at injection wells and as infrequent as every decade at extraction wells.

Optimization of the proposed project would occur throughout the design, construction, and operational phases of implementation. Changes to the number, location, and configuration of the extraction, treatment, and injection systems, and/or changes to the type, method, and configuration of the treatment delivery systems, as approved by appropriate agencies, may occur to enhance performance of the remedy to attain the cleanup goals, and to respond to site conditions and performance issues.

Controls and support facilities would be maintained throughout the operation and maintenance period. Activities may include repairs and equipment upgrades. The existing field trailer may be replaced by a larger on-site trailer to accommodate additional office space, bathrooms, and an on-site laboratory.

During implementation of the proposed project, existing and new monitoring wells would be periodically sampled to collect data to evaluate the performance of the action to obtain the remedial goals. Sampling frequency could vary between wells and over different stages of the operations and maintenance period. Sampling could be as frequent as daily for some wells over certain periods, or as infrequently as every 10 years for some wells over certain periods.

Well sampling typically involves purging a volume of water from the well, measurement of field parameters (such as pH or temperature), collecting a representative sample, and management of the purge water. The monitoring events would involve sampling with dedicated or portable pumps, tubing, and portable generators. The purge water from the wells would be transferred to purge tanks that may contain up to 1,000 gallons. Depending on the quantity and quality of purge water and available on-site facilities, purge water could be managed on-site or transported off-site to an appropriate processing facility in accordance with waste management standards and requirements. The sampling equipment and purge tanks would be transported to and from the monitoring wells by pickup trucks or in trailers towed by pickup trucks or all terrain vehicles. Support pickup trucks or SUVs may transport samples or additional equipment to the monitoring wells. Energy for pumps used during purging would typically be supplied by portable generators. Groundwater monitoring events may last up to a couple of weeks. Collected samples are usually sent to an off-site commercial laboratory for analysis, and several trips may be involved per monitoring event. Other operation and maintenance for monitoring wells may include periodic repair and replacement of pumps and/or periodic repair and replacement of water level or other field data collection devices installed within the wells. Radio or wireless communication devices, which may include solar panels for supplying power, may be installed on or near the wells to allow the remote collection of water level or water quality data and minimize the number of trips needed to each well.

The reductant for the treatment system would be delivered to the site by truck. The frequency of reductant delivery would vary based on system performance and configuration, but the frequency of deliveries during the operation and maintenance period is estimated to be 40 tanker trucks per year. The reductant would be stored in aboveground tanks prior to use in accordance with environmental and safety protocols. The reductant dosing rate would be adjusted to optimize the potential reductive capacity of the aquifer. The groundwater would be amended with reductant at a facility within the defined area of potential facility locations, and then distributed in a main header pipe (likely along National Trails Highway). Piping or hoses would carry reductant solution from the header pipeline across the floodplain to each injection well. Reductant delivery would likely be by trucks, which would transfer the reductant at full strength into the storage tanks on-site via hoses. If a mobile reductant delivery system is employed, it would involve delivery via tanker trucks, each containing up to 5,000 gallons of full-strength reductant. The reductant would then likely be added to the main conveyance lines or directly to the wellheads through dedicated pipelines, at a solution strength that could vary from less than 10% by volume to 100% by volume. The amended groundwater would likely contain less than 1% by volume of the reductant.

Roadways and utilities associated with implementation of the proposed project would be maintained throughout the life of the project. This would involve maintaining road quality, vegetation maintenance, pipeline checks, and other utility testing. An estimated 1.6 million kilowatt-hours per year of energy would be consumed to pump the freshwater through the remediation system, and 1.2 billion gallons per year of groundwater would be pumped and reinjected throughout the life of the project.

3.5.4 DECOMMISSIONING OF THE PROPOSED PROJECT

Following completion of the remedial action, when it is determined through monitoring cleanup of contaminated groundwater plume to background levels or 32 µg/l of Cr(VI), and/or following the determination that the remedial structures are no longer needed, the remedial facilities (e.g., in situ reductant storage and delivery systems, foundation material, process controls/instrumentation systems) would be decommissioned. After deconstruction and decommissioning of the facilities, the areas would be restored using decompaction and grading techniques designed to decrease erosion and accelerate revegetation of native species or as directed. The decommissioning of monitoring wells would occur approximately 10 years after the decommissioning of remediation wells. It is estimated that the length of time required to decommission all elements of the proposed project would a maximum of two years in total. One or more staging areas would likely be required for storage of materials and equipment. Staging areas would likely be located at or near the compressor station (within the fenced boundary) or other suitable locations that have already been developed or disturbed (within the project area shown on Exhibit 3-4). Standard practices such as the use of plastic sheeting laid on the ground surface, would be

employed to keep the drilling materials and equipment clean and to minimize contact of the drilling materials and equipment with the ground surface.

Decommissioning of the proposed project would generate solid waste, including incidental trash. Incidental trash typically includes empty cement and sand bags, pallets, empty drink and food containers, plastic sheeting and other disposables associated with construction work. Incidental trash would typically be collected at the end of each shift and either hauled off at the end of the day or placed in dumpsters or roll-off bins that would be hauled off-site periodically by truck to an appropriate disposal or recycling facility. Decontamination wash water generated during the decommissioning operation would be characterized and appropriately managed in conformance with applicable regulations, off-site or on-site.

3.5.4.1 DECOMMISSIONING OF WELLS

Standard well decommissioning procedures required by San Bernardino County and the California Water Resources Department would be followed for the decommissioning of all wells (including remediation and monitoring). This would typically include perforating the well casing and filling the well with cement grout. Typically, the top 5 feet of casing (including the concrete vault, any above-grade monument or concrete pad and protective bollards) is removed during decommissioning, usually by excavating an area large enough and deep enough to allow workers to enter the excavation. The soil excavated from the hole would typically be placed back in the hole as backfill; imported fill or other appropriate material would be added to the excavation to reach existing grade. The maximum area around a well that may be disturbed for excavation and restoration activities is estimated to be approximately 50 feet in diameter.

Typical equipment that may be used for decommissioning injection and extraction wells includes backhoes, dump trucks, front loaders, cement trucks or trailers, and/or pump service trucks. The length of time required to decommission the injection and extraction wells is anticipated to be between 1 day and 2 weeks per well depending on the location, depth, and size of the well. Some vegetation clearance may be necessary to accommodate equipment for the decommissioning activities.

IDW materials that would be generated during well decommissioning may include incidental trash, the 5-foot-long sections of steel casing that would be cut off the top of the well, and some amount of groundwater mixed with cement residue. Incidental trash typically includes empty cement and sand bags, pallets, empty drink and food containers, plastic sheeting, and other disposables associated with construction work. Incidental trash would typically be collected at the end of each shift and either hauled off at the end of the day or placed in dumpsters or roll-off bins that would be hauled off-site periodically by truck to an appropriate disposal or recycling facility. Piping and instruments in the well vault would be decontaminated as appropriate and disposed of as nonhazardous waste along with the additional incidental waste, or sold to a salvage company. Decontamination water or groundwater generated during the decommissioning operation would likely be processed on-site at the groundwater treatment facility and reinjected into the aquifer or transported off-site for processing to an appropriate waste receiving facility. The off-site facility likely would be in the Phoenix or Los Angeles areas, based on the disposal activities conducted to date at the Station. The concrete vault would be either removed intact or broken into pieces for subsequent disposal. The amount of investigation-derived waste materials that may be generated per well range from 5 to 20 cubic yards of solid waste and up to 2,000 gallons of water.

3.5.4.2 REDUCTANT STORAGE

Decommissioning reductant storage facilities would include removing above grade treatment facilities from the site. Removed materials would be reused, transported to an off-site disposal facility, or sold as scrap material. Equipment would be decontaminated as appropriate, such as by power washing. Decontamination wash water would be treated on-site or disposed off-site as appropriate, in conformance with applicable regulations. Regrading by placement of imported fill or other appropriate materials would typically be completed if foundation materials for the treatment facilities are removed during decommissioning.

3.5.4.3 DECOMMISSIONING OF THE FRESHWATER FLUSHING

While most facilities would be expected to be decommissioned following the completion of the remedial action, it is possible that water supply wells or the surface water intake structure may not be decommissioned and that it could be transferred to another use.

3.5.4.4 WATER CONVEYANCE, UTILITIES, AND ROADWAYS

Pipelines would be decontaminated as appropriate. Aboveground piping would be removed and either reused or disposed off-site as scrap material. Subsurface pipelines would likely be abandoned in place following decontamination. Decontamination wash water would be treated on-site or disposed off-site as described above. Electrical utilities would be disconnected from their service points and underground conduit would be left in place. Electrical or piping vaults would be excavated and removed, with the piping or conduit left in place. The excavation would be backfilled. Aboveground conduit would be removed with the piping. Electrical cable would be disposed of or sold for salvage value. Waste materials described above would be disposed of at a permitted off-site disposal facility located within approximately 200 miles of the site.

As wells and other infrastructure are removed and it is determined that access roads are no longer necessary, roads would be decommissioned from further use. They efforts involved in decommissioning would be dependent on the type of road (could be paved with asphalt, covered in gravel, or left unpaved) and the location of road (such as in previously disturbed areas or areas that were in a more natural state prior to the proposed project). Areas that are decommissioned from further use as roads would be restored back to preproject conditions. After deconstruction and decommissioning of the facilities, the areas would be restored using decompaction and grading techniques designed to decrease erosion and accelerate revegetation of native species or as directed.

3.5.4.5 DECOMMISSIONING OF IM-3

IM-3 facilities include extraction wells, injection wells, pipelines, an aboveground treatment plant and brine storage and loading facilities. IM-3 facilities that are not incorporated into the final remedial action are expected to be decommissioned following the determination that the facilities are not needed to meet remedial goals. Methodologies for decommissioning are described below.

The two interim measure injection wells (IW-02 and IW-03) and four extraction wells (PE-1, TW-2D, TW-2S, and TW-3D) would be decommissioned using similar practices as described for well decommissioning as described above. Pipelines would be decontaminated as appropriate. Aboveground piping from the treatment plant to the injection well field would be removed and either reused or disposed off-site as scrap material. Subsurface pipelines from the extraction wells to the treatment plant would likely be abandoned in place following decontamination. Decontamination wash water would be treated on-site or disposed off-site as appropriate. Electrical utilities would be disconnected from their service points and underground conduit left in place. Aboveground conduit would be removed with the piping. Electrical cable would be disposed of or sold for salvage value.

Decommissioning of the existing IM-3 Facility and brine storage and loading facilities would include removing the exterior structure, interior treatment equipment, and associated tanks and facilities from the site. Related process piping, conduit, incandescent lights, electrical trays, concrete, road surfacing, and sunshade metal cladding would be removed and either reused or transported to a local nonhazardous waste landfill. Other components such as the control trailer, sunshade steel supports, tanks, pumps, polymer system, microfilter system, reverse osmosis system, mixers, control panels, switchgears, panels, and generators are expected to be removed and either sold for salvage value or stored at the compressor station as shelf spares.

Similar to well decommissioning, the decommissioning of the treatment plant would generate solid and liquid waste. Waste streams would be identified and evaluated prior to decommissioning. This effort would involve

reviewing equipment use and spills or leaks to identify potential waste disposal or salvage options. If foundation material beneath the treatment plant is to be removed, imported fill or other appropriate materials would likely be spread over the area after removal of the foundation. Sampling of the foundation to assess whether contamination is present would typically be by wipe or core sampling if determined to be necessary. If the concrete foundation is found to be contaminated, it would be managed and disposed in accordance with regulations at locations for hazardous waste previously identified. Equipment such as process pipe and tanks would be decontaminated as appropriate, such as by power washing. Decontamination wash water would be treated on-site or disposed off-site as appropriate. The volume of wash water to be disposed depends on the volume of water generated and the availability of on-site use or disposal. Treatment can be accomplished with portable equipment (e.g., filters, pumps, tanks). If limited on-site use is available, off-site disposal or treatment options would need to be employed.

Solid waste generated would consist of incidental trash, such as empty cement and sand bags, pallets, empty drink and food containers, plastic sheeting and other disposables associated with construction work. Incidental trash would typically be collected at the end of each shift and either hauled off at the end of the day or placed in dumpsters or roll-off bins that would be hauled off-site periodically by truck to an appropriate disposal or recycling facility. The amount of materials that may be generated during the treatment plant decommissioning is estimated to be up to 5,000 cubic yards of solid waste and up to 2,000,000 gallons of water.

Typical equipment that may be used for decommissioning of the treatment plant may includes cranes, forklifts, standard and high reach demolition equipment, cutting equipment (e.g., torches, reciprocating saws), jackhammers, backhoes, graders, excavators, bulldozers, water trucks, and dump trucks. The area of disturbance for the treatment plant decommissioning is estimated to be between 1 and 3 acres. The length of time required to decommission the existing IM-3 Facility is estimated to be up to 1 year.

This page is left intentionally blank.