



*Pacific Gas and
Electric Company*

Yvonne J. Meeks
Topock Project Manager
Chromium Remediation Project Office
Gas Transmission & Distribution

6588 Ontario Road
San Luis Obispo, CA 93405

Mailing Address
4325 South Higuera Street
San Luis Obispo, CA 93401

805.546.5243
Internal: 664.5243
Fax:: 805.546.5232
E-Mail: YJM1@pge.com

August 10, 2007

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

Kris Doebbler
BLM WO-360D, Building 50
Denver Federal Center
Denver, CO 80225

Subject: Revised Final RCRA Facility Investigation/Remedial Investigation, Volume 1 – Site Background and History Report, Pacific Gas and Electric Company (PG&E), Topock Compressor Station, Needles, California (EPA ID NO. CAT080011729)

Dear Mr. Yue and Ms. Doebbler:

This letter transmits the Revised Final RCRA Facility Investigation/Remedial Investigation (RFI/RI), Volume 1 – Site Background and History Report, Pacific Gas and Electric Company (PG&E), Topock Compressor Station, Needles, California.

This report incorporates changes to the Final RFI/RI, Volume 1 – Site Background and History Report dated September 6, 2006, in response to DTSC's May 9, 2007 letter, and DTSC's emails dated July 18, 2007 and August 6, 2007. We understand from recent communications that the changes made are acceptable to both DTSC and DOI.

Please contact me at (805) 234-2257 if you have any questions regarding the attached report or any other aspect of the RFI/RI activities.

Sincerely,

Yvonne Meeks

Enclosures

Final Report

**RCRA Facility
Investigation/Remedial
Investigation Report
PG&E Topock Compressor Station
Needles, California**

Volume 1 - Site Background and History

Prepared for
Pacific Gas and Electric Company

August 2007

CH2MHILL
155 Grand Avenue, Suite 100
Oakland, California 94612

Certification

RCRA Facility Investigation (RFI)/Remedial Investigation (RI) Report PG&E Topock Compressor Station Needles, California

The information and results presented in this report are based on the review and compilation of available data obtained from numerous sources, including studies performed by others, and data from independent laboratories. To the best of our knowledge, CH2M HILL has collected and incorporated the relevant data from these previous studies and reports into this document. This document and any interpretations, conclusions, and recommendations contained within are based upon those data.

This report was prepared by CH2M HILL under the supervision of the professional whose seal and signature appears hereon, in accordance with currently accepted professional practices; no warranty, expressed or implied, is made.

Richard Sturm
Professional Geologist



Serena Lee
CH2M HILL Project Manager

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Acronyms and Abbreviations

°F	degrees Fahrenheit
ABS	Acrylonitrile-Butadiene-Styrene
ACM	asbestos-containing materials
AJCW	auxiliary jacket cooling water
ALOCW	auxiliary lubricating oil cooling water
AOC	area of concern
AST	aboveground storage tank
AT&SF	Atchison, Topeka, and Santa Fe Railway
bgs	below ground surface
BLM	United States Bureau of Land Management
BOR	United States Bureau of Reclamation
BTEX	benzene, toluene, ethylbenzene, and xylene
CACA	Corrective Action Consent Agreement
Cal/EPA	California Environmental Protection Agency
CAM	California Assessment Method
CDHS	California Department of Health Services
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CMS	corrective measures study
COPC	constituent of potential concern
Cr(III)	trivalent chromium
Cr(T)	total chromium
Cr(VI)	hexavalent chromium
CSBFD	County of San Bernardino Fire Department
CWG	Consultative Workgroup
DOI	Department of Interior
DTSC	California Department of Toxic Substances Control

E&E	Ecology and Environment
FESA	Federal Endangered Species Act
FS	feasibility study
gpd	gallons per day
gpm	gallons per minute
HNWR	Havasas National Wildlife Refuge
IM	Interim Measure
JCW	jacket cooling water
LOCW	lubricating oil cooling water
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
msl	mean sea level
NOAA	National Oceanic and Atmospheric Administration
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
OES	Office of Emergency Services
OWS	oil/water separator
OWSS	Oil/Water Separator System
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PG&E	Pacific Gas and Electric Company
ppm	parts per million
PRG	preliminary remediation goal
psi	pounds per square inch
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
RFA	Resource Conservation and Recovery Act facility assessment
RFI	Resource Conservation and Recovery Act facility investigation
RFI/RI	Resource Conservation and Recovery Act facility investigation/remedial investigation

scfd	standard cubic feet per day
SVOC	semivolatile organic compound
SWMU	solid waste management unit
TBM	tertiary butyl mercaptan
TDS	total dissolved solids
THT	tetrahydrothiophene
TPH	total petroleum hydrocarbons
TRPH	total recoverable petroleum hydrocarbons
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UST	underground storage tank
VOC	volatile organic compound
Water Board	California Regional Water Quality Control Board
WET	Waste Extraction Test

Executive Summary

Pacific Gas and Electric Company (PG&E) is conducting investigative and remedial activities at the Topock Compressor Station located in eastern San Bernardino County, California. Investigative and remedial activities at the Topock site are being performed under both the Resource Conservation and Recovery Act (RCRA) Corrective Action process pursuant to a Corrective Action Consent Agreement (CACA) entered by PG&E and California Environmental Protection Agency (Cal/EPA), Department of Toxic Substances Control (DTSC), as well as the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) pursuant to an Administrative Consent Agreement between PG&E and the Department of Interior (DOI), including the Department's Bureau of Land Management, Fish and Wildlife Service, and Bureau of Reclamation.

This document contains the site background and history of the Topock Compressor Station in support of the RCRA Facility Investigation (RFI) and the CERCLA Remedial Investigation (RI), and is Volume 1 of the Final RFI/RI for the facility. Volumes 2 and 3 of the RFI/RI contain information to evaluate the nature and extent of hazardous waste and constituent releases in groundwater and soil, respectively, and will be published separately. Other requirements of the RCRA Corrective Action and CERCLA processes, such as the identification of applicable or relevant and appropriate requirements (ARARs) and risk assessment, will be addressed in future documents.

ES.1 Overview

The Topock Compressor Station is located about 12 miles southeast of Needles on approximately 15 acres of a 65-acre parcel of PG&E-owned land (Figure 1-1). The surrounding project area includes land owned and/or managed by a number of government agencies including the United States Bureau of Land Management (BLM), United States Bureau of Reclamation (BOR), United States Fish and Wildlife Service (USFWS), and San Bernardino County (Figure 1-2). The closest communities are Moabi Regional Park (California); Topock, Arizona; and Golden Shores, Arizona. Additionally, five sovereign nations (Indian tribes) have lands that border the Colorado River as it flows south from Needles, California through Nevada, Arizona, and California to the California-Mexico border. These five tribes (from north to south) are the Fort Mojave Indian Tribe, Chemehuevi Indian Tribe, Colorado River Indian Tribes, Fort Yuma-Quechan Indian Tribe, and the Cocopah Indian Tribe. Four additional Indian tribes have an expressed interest or a stake in the Topock project: Havasupai Indian Tribe; Hualapai Indian Tribe; Yavapai-Prescott Indian Tribe; and Twenty-Nine Palms Band of Mission Indians. The land, river, animals and plants in the area have special spiritual, traditional, and/or cultural meaning to these local tribes.

Investigative and remedial activities at the Topock Compressor Station date to the 1980s with the identification of solid waste management units (SWMUs) through a RCRA Facility Assessment. The RFI began in 1996 with the signing of the CACA, and numerous phases of data collection and evaluation have been implemented. To date, major portions of the

RFI/RI have been completed, IMs have been implemented, and work towards the CMS/FS is progressing.

ES.2 Physical Characteristics and Setting of the Study Area

The Topock site and study area are located in the southern portion of the Mohave Valley, along the California-Arizona border. The study area encompasses approximately 3 square miles of the north-sloping piedmont alluvial terrace along the margin of the Chemehuevi Mountains (located to the south and west) and the floodplain of the Colorado River and Topock Marsh (located to the east and north).

The land forms in the area are characterized by alluvial terraces and incised drainage channels. One of the largest incised channels is Bat Cave Wash, a north-south dry wash (ephemeral stream) adjacent to the Topock Compressor Station. Bat Cave Wash only has brief flows following intense rainfall events and drains to the Colorado River. Locally, a floodplain borders both sides of the Colorado River. The width of the floodplain adjacent to the site averages 500 feet and narrows to the south of the site as the river enters the Topock Gorge.

Geology beneath the study area is characterized by bedrock basement formations (pre-Tertiary metamorphic/igneous rocks and consolidated Miocene conglomerate) overlain by younger sedimentary deposits. The younger sedimentary units in the study area include Tertiary and Quaternary to Recent-age alluvial fan deposits, Pliocene lacustrine deposits, and Quaternary to Recent-age fluvial deposits of the Colorado River. The alluvial fan and lacustrine deposits are generally found in the western portion of the study area, while the fluvial deposits predominate in the eastern portion of the study area underlying and adjacent to the Colorado River.

Groundwater occurs under unconfined to semi-confined conditions within the alluvial fan and fluvial deposits beneath most of the Topock site. The water table in the Alluvial Aquifer is very flat throughout the study area and is typically 1 to 2 feet of the mean river level. Due to the variable topography at the site, the depth to groundwater ranges from as shallow as 5 feet below ground surface (bgs) in floodplain wells next to the river to approximately 170 feet bgs at the upland alluvial terrace areas.

While the overall trend of groundwater flow throughout most of the Mohave Valley is southerly, groundwater flow directions at the Topock site are predominantly easterly to northeasterly. Groundwater moving south down Mohave Valley is diverted to an easterly/northeasterly direction by the low-permeability bedrock of the Chemehuevi Mountains. Groundwater levels at the Topock site are greatly influenced by the Colorado River stage, which varies both daily and seasonally in response to upstream dam discharges.

The study area lies within an area with important cultural and/or spiritual meaning to Native American Tribes. The area is the homeland of the Aha Makav, or Mojave tribe, and a place of great traditional and spiritual use that knows no physical boundaries for the Mojave. The plants, the animals, the river, the landforms, and the material remains of the past all hold deep meaning. Archaeological surveys have documented 149 prehistoric and

historic resources in the study area, including the Topock Maze, which is included in the National Register of Historic Places.

The Havasu National Wildlife Refuge is located in the study area, a portion of which borders the compressor station. Ecological resources in the study area include five types of plant communities: Mojave Creosote Bush Scrub, Mojave Wash Scrub, Desert Riparian, Tamarisk Thicket, and Freshwater Marsh. The aquatic and terrestrial habitats in the project area support fish, amphibians, reptiles, birds and mammals, including several threatened or endangered species (state-listed and federally-listed).

ES.3 Site History

In December 1951, the Topock Compressor Station began operations to compress natural gas supplied from the southwestern United States for transport through pipelines to PG&E's service territory in central and northern California. The property on which the compressor station was built was owned by the State of California. From 1951 to 1965, PG&E leased the property from the State. In 1965, PG&E purchased the property from the State. The compressor station is still active and is anticipated to remain an active facility into the foreseeable future.

Current operations at the compressor station are very similar to the operations that occurred from the start of facility operations in 1951. The operations at the compressor station consist of six major activities: compression of natural gas, cooling of the compressed natural gas and compressor lubricating oil, water conditioning, wastewater treatment, facility and equipment maintenance, and miscellaneous operations. The greatest use of chemical products at the facility involves treatment of cooling water, and the greatest volume of waste produced consists of blowdown from the cooling towers (i.e., water that is routinely removed from the towers to prevent chemical buildup and scale formation).

From 1951 to 1985, hexavalent chromium [Cr(VI)]-based products were added to the cooling water to inhibit corrosion, minimize scale, and control biological growth. From 1951 to 1964, untreated wastewater (i.e., blowdown) containing Cr(VI) was discharged to Bat Cave Wash. Aerial photographs from that time period show what appears to be a light-colored flow in the wash that originates at the discharge point and, at times, extends up to 1,600 feet northward. Beginning in 1964, PG&E began to treat the wastewater in a single-step process to convert Cr(VI) to trivalent chromium [Cr(III)]. At about this time, 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) (Step 1) and then removed Cr(III) (Step 2).

Beginning in May 1970, treated wastewater was discharged to an injection well (PGE-08) located on PG&E property, and discharges to Bat Cave Wash generally ceased. The well facilitated the injection of wastewater into the subsurface at depths in excess of 405 bgs. By 1971, PG&E had constructed the first of four single-lined evaporation ponds, and used this pond as a discharge location when operational problems were encountered with the injection well. In 1973, PG&E discontinued use of injection well PGE-08, and wastewater was discharged exclusively to the four, single-lined evaporation ponds, located about 1,600 feet west of the compressor station.

PG&E replaced the Cr(VI)-based cooling water treatment products with non-hazardous 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 until 1989. In 1989, the single-lined ponds were replaced with four new, Class II (double-lined) ponds, located approximately 1.2 miles to the northwest. The wastewater treatment system and the single-lined ponds were physically removed and clean-closed between 1988 and 1993. The four, Class II double-lined ponds, which are on BLM property, are still in use and are operated under the jurisdiction of the State of California Regional Water Quality Control Board, Colorado River Basin Region.

ES.4 SWMUs, AOCs, and Other Undesignated Areas

Fourteen solid waste management units (SWMUs) have been identified at the Topock compressor station. The following SWMUs were identified in the RCRA facility assessment performed by the United States Environmental Protection Agency (USEPA) in 1987 and/or by DTSC in the 1996 CACA:

- SWMU 1 (Unit 4.1) - Former Percolation Bed
- SWMU 2 (Unit 4.2) - Inactive Injection Well (PGE-08)
- SWMU 3 - PG&E Inactive Well #6 (PGE-06)
- SWMU 4 - PG&E Inactive Well #7 (PGE-07)
- SWMU 5 (Units 4.12 and 4.13) - Sludge Drying Beds
- SWMU 6 (Unit 4.7) - Chromate Reduction Tank
- SWMU 7 (Unit 4.9) - Precipitation Tank
- SWMU 8 (Unit 4.10) - Process Pump Tank
- SWMU 9 (Unit 4.8) - Transfer Sump
- SWMU 10 (Unit 4.11) - Old Evaporation Ponds
- Unit 4.3 - Oil/Water Holding Tank
- Unit 4.4 - Oil/Water Separator
- Unit 4.5 - Portable Waste Oil Storage Tank
- Unit 4.6 - Waste Oil Storage Tank

Twenty areas of concern (AOCs) have also been identified at the Topock Compressor Station. The following AOCs were identified by DTSC in the CACA or in subsequent DTSC directives:

- AOC 1 - Area Around Former Percolation Bed
- AOC 2 - Area Around Inactive Injection Well PGE-08
- AOC 3 - Area Around PG&E Inactive Wells PGE-06 and PGE-07
- 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 Fenceline
- AOC 10 - East Ravine
- AOC 11 - Topographic Low Areas

- AOC 12 - Fill Area
- AOC 13 - Unpaved Areas at Compressor Station
- AOC 14 - Railroad Debris Site
- AOC 15 - Auxiliary Jacket Cooling Water Pumps
- AOC 16 - Sandblast Shelter
- AOC 17 - Onsite Septic System
- AOC 18 - Combined Wastewater Transference Pipelines
- AOC 19 - Former Cooling Liquid Mixing Area
- AOC 20 - Industrial Floor Drains

Two other potentially impacted areas have been identified in the vicinity of the Topock Compressor Station through review of historical compressor station operational information. The two other undesignated areas are:

- Potential Pipe Disposal Area
- Former 300B Pipeline Liquids Tank

The locations of the SWMUs, AOCs, and undesignated areas are shown on Figure 4-1.

ES.5 Status of SWMUs, AOCs, and Other Undesignated Areas Within the Site Investigation and Closure Process

The SWMUs, AOCs, and other undesignated areas identified at the Topock Compressor Station have been identified at different times during the history of the RCRA Corrective Action process. Therefore, the status of many of the areas differs significantly, and 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 SWMUs, AOCs, and other undesignated areas have been divided into three groups according to their status within the site investigation, remediation, and closure process.

ES.5.1 SWMUs and AOCs for Which Site Investigation and Closure Process is Complete

The RCRA Corrective Action and CERCLA closure processes are considered to be complete at eight SWMUs and AOCs. They are:

- SWMU 2 - Inactive Injection Well (PGE-08) (soil only)
- SWMU 3 - Inactive Well PGE-06
- SWMU 4 - Inactive Well PGE-07
- SWMU 7 - Precipitation Tank
- SWMU 10 - Old Evaporation Ponds
- Unit 4.6 - Waste Oil Storage Tank
- AOC 2 - Area Around Inactive Injection Well (PGE-08)
- AOC 3 - Area Around Inactive Wells #6 and #7 (PGE-06 and PGE-07)

SWMU 2 is the injection well, PGE-08. The well was used for injection of treated wastewater. There is no evidence that any wastes would have been disposed around the well, and it is not expected that there is any soil contamination at SWMU 2. Therefore, the

unit is closed for soil, and no future soil evaluation is necessary. Groundwater will be evaluated as part of RFI Volume 2.

Review of historical information associated with SWMU 3 (Inactive Well PGE-06), SWMU 4 (Inactive Well PGE-07), and AOC 3 (Area Around Inactive Wells PGE-06 and PGE-07) has concluded that no wastes were disposed of in or around these inactive wells. These SWMUs/AOC are therefore considered closed, and will not be addressed further in RCRA Corrective Action or CERCLA site investigation and closure activities at the Topock Compressor Station.

SWMU 7 (Precipitation Tank) was part of the former wastewater treatment system, and was located within the facility fenceline on the southern portion of the lower yard. The precipitation tank was removed from service along with the rest of the treatment system in October 1985. The precipitation tank was clean closed by PG&E between November 1989 and March 1990, and a closure certification acceptance letter for this unit was issued by DTSC in 1995. SWMU 7 is therefore considered closed, and will not be addressed further in RCRA Corrective Action or CERCLA site investigation and closure activities at the Topock Compressor Station.

SWMU 10 (Old Evaporation Ponds) consisted of four ponds, designated as Pond Nos. 1, 2, 3, and 4, located approximately 1,000 feet west-southwest of the compressor station. The construction of Pond No. 1 was completed in 1971 and Pond Nos. 2 through 4 were completed in 1974. The ponds received treated wastewater from the compressor station. The evaporation ponds were clean closed by PG&E in 1993, and a closure certification acceptance letter for this unit was issued by DTSC in 1995. SWMU 10 is therefore considered closed, and will not be addressed further in RCRA Corrective Action or CERCLA site investigation and closure activities at the Topock Compressor Station.

Unit 4.6 (Waste Oil Storage Tank) is an above-ground storage tank in active service. The tank is located within the facility fenceline in the eastern portion of the facility within the oil and fuel storage area. The tank is equipped with secondary containment, periodically inspected, and there have been no known releases from this tank. Unit 4.6 will therefore not be addressed further in RCRA Corrective Action or CERCLA site investigation and closure activities at the Topock Compressor Station.

AOC2 consists of the surficial soil around PGE-08 as well as in the pipeline to the injection well which transmitted facility wastewater. There is no evidence of surficial releases to the area surrounding the former injection well, and any incidental releases from the pipeline to the well will be addressed through AOC 18. AOC 2 will therefore not be addressed further in the RCRA corrective action or CERCLA site investigation and closure activities at the Topock Compressor Station.

ES.5.2 Previously Closed SWMUs and AOCs for Which Further Investigation Has Been Requested

The nine SWMUs and AOCs in this group are:

- SWMU 5 (Sludge Drying Beds)
- SWMU 6 (Chromate Reduction Tank)
- SWMU 8 (Process Pump Tank)

- SWMU 9 (Transfer Sump)
- AOC 18 (Former Two-step Wastewater Treatment System Piping)
- Unit 4.3 (Oil/Water Holding Tank)
- Unit 4.4 (Oil/Water Separator)
- Unit 4.5 (Portable Waste Oil Holding Tank)
- Former 300B Pipeline Liquids Tank

Five of these SWMUs and AOCs (SWMU 5, SWMU 6, SWMU 8, SWMU 9, and AOC 18) were part of the former wastewater treatment system. PG&E performed closure activities of this system between November 1988 and November 1993. Closure activities included removal of equipment and foundations, removal of impacted soil, and confirmation soil sampling. Closure activities were performed in accordance with an approved closure plan, and a closure certification acceptance letter was issued by DTSC on June 26, 1995. The piping (AOC 18) was not identified as a separate unit, but was included as part of the closure of the entire system. In a letter dated July 13, 2006 DTSC requested additional investigation at these five SWMUs and AOCs.

Similarly, DTSC also requested additional investigation of Units 4.3, 4.4, and 4.5, which were part of the former oily water treatment system. PG&E performed closure activities at the oily water treatment system between November 1989 and March 1990 that included removal of equipment, removal of impacted soil, and confirmation soil sampling.

DTSC, with concurrence from DOI, has further requested additional investigation at the Former 300B Pipeline Liquids Tank. Closure activities at this former aboveground tank were performed in 1995 and 1996 and included removal of the tank and associated piping, removal of impacted soil, and confirmation soil sampling. San Bernardino County issued a closure certification letter on June 9, 1997.

ES.5.3 SWMUs, AOCs, and Other Undesignated Areas to be Carried Forward in RFI/RI

The SWMUs, AOCs, and other undesignated areas in this group will be carried forward in the RCRA Corrective Action and CERCLA program. The 20 SWMUs, AOCs, and other undesignated areas in this group are:

- SWMU 1 – Former Percolation Bed
- SWMU 2 – Inactive Injection Well (PGE-08) (groundwater only)
- AOC 1 – Area Around Former Percolation Bed
- AOC 4 – Debris Ravine
- AOC 5 – Cooling Tower A
- AOC 6 – Cooling Tower B
- AOC 7 – Hazardous Materials Storage Area
- AOC 8 – Paint Lockers
- AOC 9 – Southeast Fence Line (Outside Visitor Parking Area)
- AOC 10 – East Ravine
- AOC 11 – Topographic Low Area
- AOC 12 – Fill Area
- AOC 13 – Unpaved Areas within the 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 Liquid Mixing Area
- AOC 20 - Industrial Floor Drains
- Potential Pipe Disposal Area

For most of the SWMUs, AOCs, and other undesignated areas in this group, data have been collected during site investigation activities dating to the start of the RFI in 1996. Previous sampling has not been conducted at AOCs 7, 8, 11, 12, 16, 20, and the Potential Pipe Disposal Area. Through review of information associated with historic compressor station operations, these areas have been identified as potentially impacted, although no site investigation sampling has been performed in these areas to date. The remaining SWMUs, AOCs, and other undesignated areas in this group have been evaluated during the numerous phases of investigation conducted at the Topock site since RFI activities began in 1996.

Based upon information pertaining to past disposal practices, each of the 20 SWMUs, AOCs, and other undesignated areas in this group will either be addressed in Volume 2 (Groundwater) of the RFI/RI, and/or in Volume 3 (Soil) of the RFI/RI. Results of investigations, both past and present, will be incorporated into Volumes 2 and 3 of the RFI/RI to complete the site investigative requirements of the RCRA Corrective Action and CERCLA processes at these 20 SWMUs, AOCs, and other undesignated areas.

The SWMUs and AOCs to be addressed in Volume 2 (Groundwater) of the RFI/RI are:

- SWMU 1 – Former Percolation Bed
- SWMU 2 – Inactive Injection Well (PGE-08)
- AOC 1 – Area Around Former Percolation Bed

The SWMUs, AOCs and other undesignated areas to be addressed in Volume 3 (Soil) of the RFI/RI are:

- SWMU 1 – Former Percolation Bed
- AOC 1 – Area Around Former Percolation Bed
- AOC 4 – Debris Ravine
- AOC 5 – Cooling Tower A
- AOC 6 – Cooling Tower B
- AOC 7 – Hazardous Materials Storage Area
- AOC 8 – Paint Lockers
- AOC 9 – Southeast Fence Line (Outside Visitor Parking Area)
- AOC 10 – East Ravine
- AOC 11 – Topographic Low Area
- AOC 12 – Fill Area
- AOC 13 – Unpaved Areas within the 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 Liquid Mixing Area
- AOC 20 - Industrial Floor Drains
- Potential Pipe Disposal Area

1.0 Introduction

Pacific Gas and Electric Company (PG&E) is conducting investigative and remedial activities at the Topock Compressor Station (also referred to herein as “the compressor station” or “the facility”) located in eastern San Bernardino County.

The California Environmental Protection Agency (Cal/EPA), Department of Toxic Substances Control (DTSC) is the state lead agency charged with directing remedial and investigative activities at the compressor station in accordance with the federal Resource Conservation and Recovery Act (RCRA). In February 1996, PG&E and DTSC entered into a Corrective Action Consent Agreement (CACA) pursuant to Section 25187 of the California Health and Safety Code (DTSC 1996). Under the terms of the CACA, PG&E agreed to conduct a RCRA facility investigation (RFI) to identify and evaluate the nature and extent of hazardous waste and constituent releases at the compressor station.

The United States Department of the Interior (DOI) is the lead Federal agency, on land under its jurisdiction, custody or control, and is responsible for oversight of response actions being conducted by PG&E pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Portions of the site where hazardous substances from the Topock compressor station have come to be located are on or under land managed by the Department’s Bureau of Land Management (BLM), Fish and Wildlife Service (USFWS), and Bureau of Reclamation (BOR) (collectively the “federal agencies”). In July 2005, PG&E and the federal agencies entered into an Administrative Consent Agreement to implement response actions at the site as set forth in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (DOI 2005a).

This document contains the site background and history of the Topock Compressor Station in support of the RFI and the CERCLA remedial investigation, and is Volume 1 of the Final RFI/RI for the facility. Volumes 2 and 3 of the RFI/RI contain information to evaluate the nature and extent of hazardous waste and constituent releases in groundwater and soil, respectively, and are published separately.

Three draft versions of the RFI Report have previously been prepared, in April 2000 (E&E 2000a), February 2004 (E&E 2004), and February 2005 (CH2M HILL 2005). This document has been prepared in accordance with DTSC’s review of and comments on the February 2005 RFI/RI, as documented in its letter dated July 13, 2006 (DTSC 2006a). In addition, Federal Agency comments on the February 2005 RFI/RI (DOI 2005b) are addressed in this document as they pertain to the site background and history of the compressor station. All comments and responses to the comments are included in Appendix A.

1.1 Project Setting

This section provides information about the location, land ownership and management, and nearby communities.

1.1.1 Location

The compressor station is located in eastern San Bernardino County, California, about 12 miles southeast of Needles, as shown in Figure 1-1. The compressor station began operations in 1951 to compress natural gas supplied from the southwestern United States for transport through pipelines to PG&E's service territory in central and northern California.

1.1.2 Land Ownership and Management

The compressor station occupies approximately 15 acres of a 65-acre parcel of PG&E-owned land. The property on which the compressor station was built was previously owned by the State of California. From 1951 to 1965, PG&E leased the property from the State. In 1965, PG&E purchased the property from the State.

PG&E also owns a 100-acre parcel located about 0.25 mile north of the compressor station, purchased in 2004 to facilitate interim remedial measures. The surrounding area includes land owned and/or managed by a number of government agencies including the BLM, BOR, USFWS, and San Bernardino County (Figure 1-2).

1.1.3 Nearby Communities

There are several communities in the general vicinity of the PG&E Topock Compressor Station, as shown in Figure 1-3. The nearest communities are mobile home parks at Topock, Arizona and Moabi Regional Park, California and the town of Golden Shores, Arizona.

Topock is located on the Arizona (or eastern) side of the Colorado River, about 0.5 mile east-northeast of the compressor station. Topock is a community of about 20 people in a small mobile home park near the Topock Gorge Marina. Most of the residents in Topock are retired senior citizens who live in the area part of the year, typically from late fall through spring. There are also a small number of permanent homes (i.e., the homes are occupied all year) located on the southern side of Interstate 40 (I-40).

Moabi Regional Park is located on the California (or western) side of the Colorado River, about 1 mile northwest of the compressor station. Moabi Regional Park is a part of San Bernardino County's regional parks system. It is primarily a recreational facility with mobile homes, camping units, and a boat marina. The park is located on a side channel of the Colorado River, approximately 1 mile west of the main river channel. The mobile homes are used primarily as weekend residences. As a regional park, it has no full-time residences.

Golden Shores is a community of about 1,300 homes (population approximately 1,800) in Mohave County, Arizona. It is located approximately 5 miles north of the compressor station on the east side of the Colorado River. Its demographics include both permanent and recreational residents. Golden Shores includes several small businesses, a fire station, a post office, and an elementary school.

The proximity of the compressor station to the Colorado River and to the California and Arizona state border has meant that DTSC and PG&E work to keep many additional cities and stakeholders informed (in addition to the most proximate, as required under RCRA). These additional cities and stakeholders include the City of Needles, approximately 12 miles

northwest of the facility, and Lake Havasu City and the City of Parker (18 and 40 miles south-southeast of the facility, respectively).

Additionally, five sovereign nations (Indian tribes) have lands that border the Colorado River as it flows over 230 miles south from Needles, California through Nevada, Arizona, and California to the California-Mexico border. These five tribes (from north to south) are the Fort Mojave Indian Tribe, Chemehuevi Indian Tribe, Colorado River Indian Tribes, Fort Yuma-Quechan Indian Tribe, and the Cocopah Indian Tribe. Four additional Indian tribes have an expressed interest or a stake in the Topock project: Havasupai Indian Tribe; Hualapai Indian Tribe; Yavapai-Prescott Indian Tribe; and Twenty-Nine Palms Band of Mission Indians. The land, river, animals, and plants in the area have special spiritual, traditional, and/or cultural meaning to these local tribes.

1.2 History of Investigative and Remedial Activities at Topock Compressor Station

Investigative and remedial activities at the Topock Compressor Station date to the 1980s with the identification of solid waste management units through a RCRA facility assessment (RFA). The RFI began in 1996 with the signing of the CACA, and numerous phases of data collection and evaluation have been implemented. Since 2005, investigative and remedial activities have been performed pursuant to both RCRA corrective action and CERCLA.

To date, major portions of the RFI/RI have been completed, Interim Measures (IMs) have been implemented, and work toward the corrective measures study (CMS) is progressing. The CMS will also address the requirements of the feasibility study under CERCLA. The status of the RFI/RI, IMs, and CMS/FS are summarized briefly below.

1.2.1 RCRA Facility Investigation/Remedial Investigation

The identification of solid waste management units (SWMUs) and areas of concern (AOCs) occurred through the RFA (Kearny 1987), the CACA (DTSC 1996), and subsequent research efforts including the February 2005 RFI/RI (CH2M HILL 2005). This document addresses agency comments on the February 2005 RFI/RI as they pertain to site background and history of the Topock Compressor Station, past materials and waste handling practices at the facility, and the identification of the SWMUs and AOCs to be characterized in the RFI/RI.

Since 1996, there have been six phases of investigation at the Topock site to collect data to evaluate the nature and extent of contamination at the SWMUs and AOCs. Much of the focus of investigation in recent years has been on defining the extent of hexavalent chromium in groundwater at the site. Additional investigation is planned to complete the characterization of soil contamination within the fenceline of the compressor station and at units outside the fenceline within and surrounding the PG&E property.

As directed by DTSC (DTSC 2006a), the Final RFI/RI is being separated into three volumes. This document is Volume 1 (Site Background and History). Volume 2 of the RFI/RI will contain groundwater, surface water, pore water, and river sediment data, and Volume 3 will contain soil data. The separation of the Final RFI/RI into three volumes is intended to

efficiently manage the large amount of information associated with the RFI/RI, and to accelerate site remediation by allowing earlier remedial planning of those portions of the RFI/RI completed earlier.

1.2.2 Interim Measure

PG&E began implementing interim measures at the site in March 2004. Initially groundwater was extracted from a monitoring well cluster located on a bench above and to the west of the river floodplain (commonly referred to as the MW-20 bench). This operation was eventually replaced by the existing extraction well system. Groundwater extraction began at wells TW-2S and TW-2D in May 2004, at well TW-3D in December 2005, and at well PE-1 in 2006. Prior to the construction and operation of the current groundwater treatment and extraction systems, a batch treatment plant was located on the MW-20 bench and treated groundwater was transported offsite for disposal at a permitted facility.

Currently, PG&E is implementing Interim Measure Number 3 (IM No. 3) at the Topock site. IM No. 3 consists of groundwater extraction for hydraulic control of the groundwater plume boundaries in the Colorado River floodplain and management of extracted groundwater. Operation of the current groundwater treatment and injection system began in July 2005. The groundwater pumping, transport and disposal activities are considered an IM pursuant to Section IV.A of the CACA. The purpose of the IM is to maintain hydraulic control of the groundwater plume boundaries until the time that a final corrective action is in place at the site. As defined by DTSC, the performance standard for IM No. 3 is to “establish and maintain a net landward hydraulic gradient, both horizontally and vertically, that ensures that hexavalent chromium (Cr[VI]) concentrations at or greater than 20 micrograms per liter (µg/L) in the floodplain are contained for removal and treatment.”

Currently, the IM facilities include a groundwater extraction system (four extraction wells TW-2D, TW-3D, TW-2S, and PE-1), conveyance piping, a groundwater treatment plant, and an injection well field for the discharge of the treated groundwater. Of the four extraction wells, two are currently in operation (TW-3D and PE-1). The groundwater treatment system is a continuous, multi-step process that involves reduction of Cr(VI) to the less soluble trivalent form, Cr(III), precipitation and removal of precipitate solids by clarification and microfiltration, and lowering the naturally-occurring total dissolved solids (TDS) using reverse osmosis. Treated groundwater is returned to the aquifer through an injection system consisting of two injection wells, IW-2 and IW-3. The existing groundwater extraction, treatment, and injection systems, collectively, are referred to IM No. 3.

1.2.3 Corrective Measures Study/Feasibility Study

The CMS is the step in the RCRA corrective action process that corresponds to the feasibility study step in the CERCLA process. The results of the RFI/RI are used to define the release and to determine the cleanup objectives. The CMS/FS identifies the technologies that may be effective for remediating past releases and develops different combinations of those technologies into overall remedial alternatives for all or part of the site. Those alternatives are then evaluated based on state and federal selection criteria and used to identify a recommended cleanup approach for the site.

The objective of the CMS/FS at the Topock Compressor Station will be to develop and evaluate corrective measure alternatives and to recommend the most appropriate alternative to manage contaminated groundwater, sediment, and soil, where required. The CMS/FS will define cleanup levels for groundwater, and soil (as applicable) that will be protective of human health and the environment. The CMS/FS will focus on the evaluation of potential cleanup technologies and the development, evaluation, and selection of a recommended alternative that is both protective of human health and the environment and consistent with remedial objectives.

PG&E submitted a draft CMS work plan to DTSC in December 2002 (PG&E 2002a). Simultaneously with RFI/RI investigations and interim measures activities, PG&E has continued to collect information on and preliminarily evaluate remedial technologies for the Topock site. This information will be presented in the CMS/FS. Groundwater corrective measures/remedial actions to be evaluated in the CMS/FS will likely include: monitored natural attenuation; hydraulic control such as through groundwater extraction and/or an impermeable barrier; *in-situ* treatment through chemical and/or biological reducing agents; and *ex-situ* treatment through pumping groundwater to an aboveground treatment facility and treating it by chemical, physical, or biological processes. Soil corrective measure technologies, which will also be evaluated in the CMS/FS, may include institutional controls (deed restrictions), *in-situ* stabilization, capping, and excavation and disposal.

1.3 Purpose and Objectives of the RFI/RI

On February 26, 1996, DTSC issued the CACA based on the RCRA corrective action process. The CACA defines the required actions and documents that must be completed by PG&E for the Topock Compressor Station under the RCRA corrective action process. Since 1996, PG&E has worked through the RCRA corrective action process under the oversight of DTSC.

The Consent Agreement with the federal agencies requires that PG&E prepare an RFI Report that is equivalent to, and complies with all substantive requirements pertaining to, a Remedial Investigation conducted under CERCLA and the NCP, 40 Code of Federal Regulations (CFR) Part 300.

The RFI and CERCLA remedial investigation are similar site characterization programs. Table 1-1 provides a comparison of the site identification and investigative requirements of the RCRA corrective action and CERCLA processes. Where appropriate the regulatory citation is provided along with identification of how the current activities meet the requirements of each program.

1.4 Opportunities for Public Involvement

DTSC, with assistance from PG&E, has an extensive public participation and outreach program addressing corrective action activities at the Topock Compressor Station. The program activities are also in conformance with public participation requirements under CERCLA. These activities include hosting numerous meetings, briefings, and site tours for elected officials; federal, state, county, and city agency staff; and local tribal representatives. Additional activities include conducting community assessments, producing and

distributing fact sheets, maintaining a project website and site mailing list, holding public meetings, conducting site tours and other stakeholder briefings, and updating the Public Participation Plan and project information repositories.

1.4.1 Public Participation Resources

The Public Participation Plan for the project, dated February 2007, is available in the information repositories or from DTSC (DTSC 2007a). DTSC has also prepared communication process documents with the Chemehuevi and Colorado River Indian tribes (DTSC 2007b and DTSC 2007c) and is also working with other tribes on communication protocols. DTSC also maintains local information repositories located in six Mojave Desert cities and tribal reservations. DTSC also maintains a project Web site, www.dtsc-topock.com, which provides activity updates, project documents, locations of the information repositories, opportunities to join the site mailing list or provide comments to DTSC, and other related resources.

1.4.2 Stakeholder Involvement

Although DTSC is the lead agency and is responsible for making decisions with respect to RCRA corrective action activities, DTSC has been working closely with other state and federal regulators and key project stakeholders for many years. A key component of stakeholder involvement in the project is the Consultative Workgroup (CWG), convened by DTSC, which is comprised of over 15 federal, state, and other agencies who provide guidance on technical matters and project activities. Included in the CWG is the Arizona Department of Environmental Quality, with whom DTSC and PG&E coordinate public participation and outreach efforts in Arizona. DTSC coordinates public participation efforts with other stakeholders as appropriate. A full list of CWG members can be found on DTSC's Topock project Web site or in the Public Participation Plan referenced above.

Agency consultations for compliance with federal requirements such as the Section 106 of the National Historic Preservation Act and Section 7 of the Endangered Species Act are conducted separately and are the responsibility of the federal agencies.

1.5 Report Organization

This document is Volume I of the RFI/RI for the Topock Compressor Station (Final Site Background and History), intended to document the historical materials and waste management practices at the Topock Compressor Station and present a complete identification of potential areas for investigation based on the historical information. Characterization of the identified areas for investigation will be presented in Volumes 2 and 3 of the RFI.

Terms defined under RCRA that are used in this report and that correspond to terms defined under CERCLA are intended to be construed to include the CERCLA term. In particular, SWMUs and AOCs identified in this report shall be construed to be facilities where a release or threatened release of a hazardous substances has occurred, as defined under CERCLA. Additional requirements pertaining to a CERCLA remedial investigation report, if not adequately addressed in this report will be addressed in future documents.

The remainder of Volume 1 is organized in the following manner:

- A discussion of the physical characteristics and setting for the project area is provided in Section 2.0.
- Details on facility operations and history, including operational processes, chemical usage, and waste generation and management are provided in Section 3.0.
- Details on SWMUs and AOCs identified at or associated with the compressor station, are described in Section 4.0.
- The status of each SWMU or AOC, or other undesignated area is within the RFI process (i.e., closed, investigation complete/incomplete, or investigation pending) is presented in Section 5.0.
- Documents referenced in the preparation of this report are provided in Section 6.0.

TABLE 1-1

Status and compliance with the site identification and investigative requirements of the RCRA Corrective Action and CERCLA processes
RCRA Facility Investigation/Remedial Investigation (Volume 1), PG&E Topock Compressor Station, Needles, California

Activity	RCRA Corrective Action	CERCLA	Topock Compliance with both Regulations
Investigate the Nature and Extent of Contamination, i.e. Conduct Detailed Site Investigations (RFI/RI)	<p>RCRA Facility Investigation (RFI)</p> <p>General purpose of the RFI is to characterize the nature, extent, direction, rate, movement, and concentration of releases, determine the potential need for corrective measures, and aid in selection and implementation of those measures</p> <p>Technical requirements, procedures, and reports</p> <p>The objectives of the RFI as specified in the CACA (DTSC 1996) and other DTSC directives (DTSC 2004a-b), are to:</p> <ul style="list-style-type: none"> • Provide information pertinent to the facility including current and historical operations, processes, and waste management practices. • Identify and characterize sources of contamination. • Define the nature, degree, and extent of contamination. • Define the rate of movement and direction of contamination flow. • Characterize the potential pathways of contaminant migration. • Identify actual or potential human and/or ecological receptors and evaluate potential impacts to them. • Gather data needed to make decisions on interim measures/stabilization during the early phases of the RFI. • Support development of alternatives from which a corrective measure will be selected by DTSC. 	<p>Remedial Investigation (RI)</p> <p>General purpose of the RI is to collect data necessary to adequately characterize the site for the purpose of developing and evaluating effective remedial alternatives. (40 CFR 300.430(d)(1)).</p> <ul style="list-style-type: none"> • 40 CFR Section 300.430(d) requires that the RI adequately characterize the nature of and threat posed by the hazardous substances and materials and assess the extent to which the release poses a threat to human health and the environment. To define potential transport pathways and receptor populations and to support the analysis and design of potential response actions, the RI must assess the following factors: <ul style="list-style-type: none"> • Physical characteristics of the site to include surface features, soils, geology, hydrogeology, meteorology, and ecology • Characteristics of air, surface water, and groundwater • Source identification and characterization including facility characteristics that identify source locations; quantity of wastes that are contained in, or have been released in the environment; the physical and chemical characteristics of wastes present in the sources • Define exposure pathways and exposure routes • Define other factors, such as sensitive populations, that pertain to the characterization of the site or support analysis of remedial alternatives 	<p>Volumes 2 and 3 of the RFI/RI address the requirements under RCRA Corrective Action and CERCLA to characterize the source, nature and extent of contamination at each of the SWMUs and AOCs identified in Volume 1.</p> <p>Volumes 2 and 3 of the RFI/RI also characterize physical properties of the site, and identify potential receptors and exposure pathways.</p> <p>Identification of potential ARARs and potential site-related risk will be documented separately from the RFI/RI Volumes 1, 2, and 3.</p> <p>Treatability studies and identification of applicable technologies, are addressed separately from the RFI/RI Volumes 1, 2, and 3 in support of the RCRA Corrective Measures Study (CMS)/Feasibility Study (FS).</p>

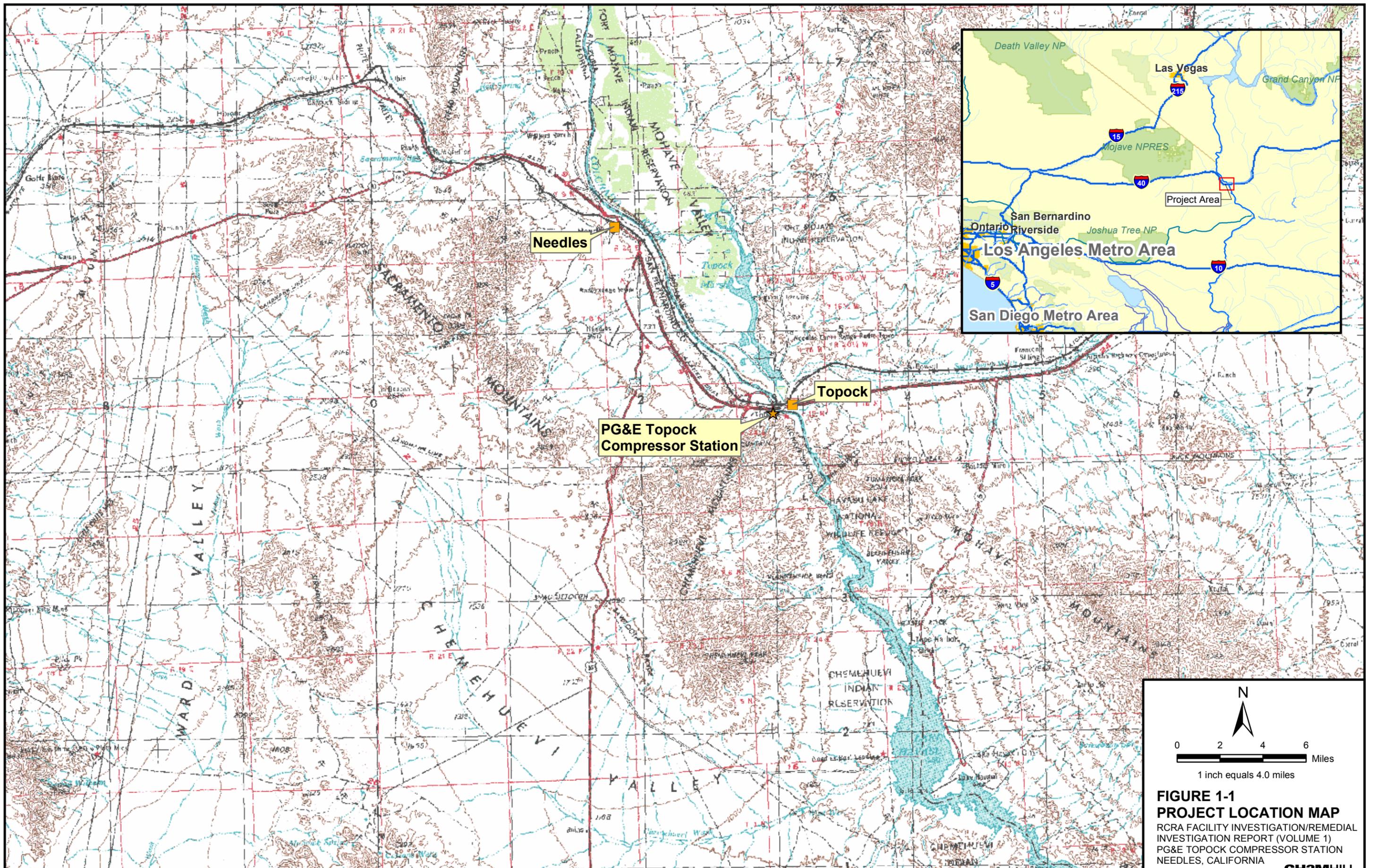
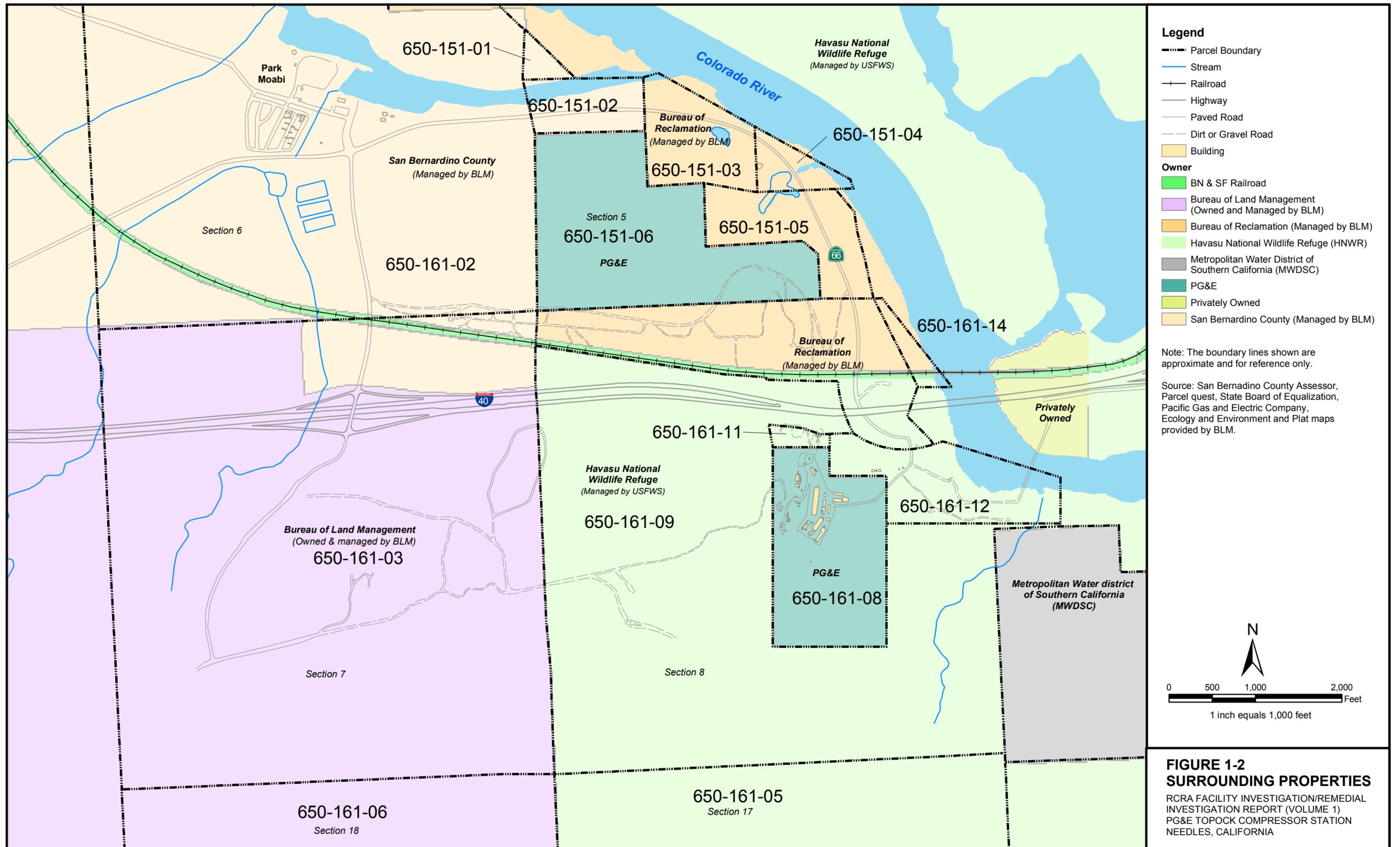


FIGURE 1-1
PROJECT LOCATION MAP
 RCRA FACILITY INVESTIGATION/REMEDIAL
 INVESTIGATION REPORT (VOLUME 1)
 PG&E TOPOCK COMPRESSOR STATION
 NEEDLES, CALIFORNIA



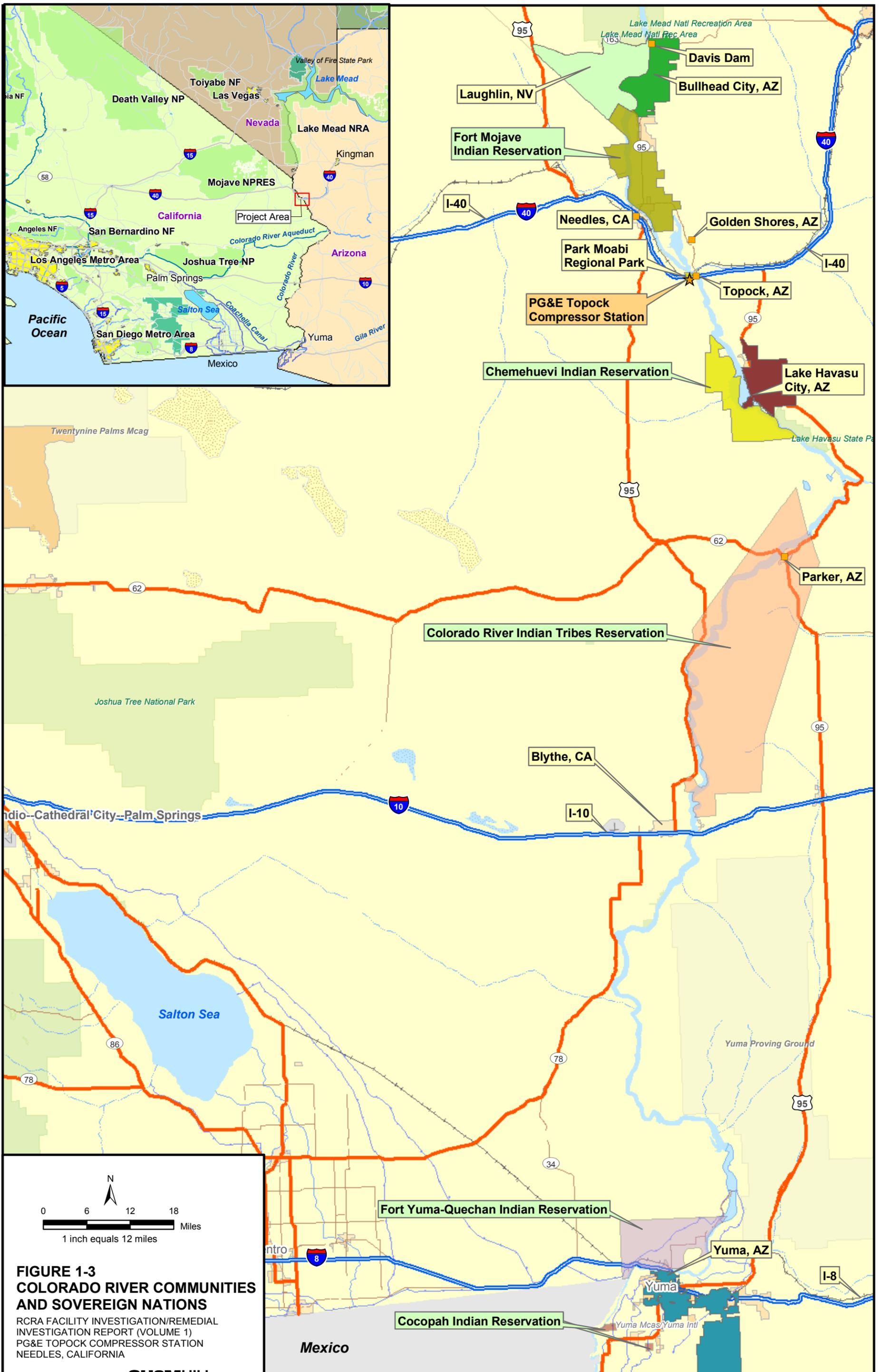


FIGURE 1-3
COLORADO RIVER COMMUNITIES
AND SOVEREIGN NATIONS
 RCRA FACILITY INVESTIGATION/REMEDIAL
 INVESTIGATION REPORT (VOLUME 1)
 PG&E TOPOCK COMPRESSOR STATION
 NEEDLES, CALIFORNIA

CH2MHILL