RCRA FACILITY ASSESSMENT
PACIFIC GAS AND ELECTRIC COMPANY
TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

EPA Region 9 Number CAT080011729

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EXECUTIVE SUMMARY

A RCRA facility assessment (RFA) was performed to identify and evaluate solid waste management units (SWMUs) and other areas of concern at the Pacific Gas and Electric Company (PG&E) Topock Compressor Station. The RFA utilizes records review, data evaluation, interviews, and a visual site inspection to evaluate the potential for releases of hazardous constituents from SWMUs identified during the assessment. The records review was based on information found in the RCRA and CERCLA files of EPA Region 9, files and reports of the California Department of Health Services, and the Regional Water Quality Control Board, Colorado River Basin Region.

The PG&E Compressor station has operated at this location since the 1950s. The facility consists of ten natural gas compressor units with a total combined output of 35,000 horsepower.(1,2,3) The station handles approximately one-third of PG&E's total natural gas supply. Associated with the compressors are cooling towers, and associated wastewater treatment units. The facility received RCRA interim status for four surface impoundments, which it is currently closing as a result of process changes in the wastewater treatment system.

As a result of this assessment a total of 16 SWMUs were identified at this facility. Two of these SWMUs were identified during the VSI. The SWMUs of concern at this facility, due to past releases, include the inactive percolation bed (Unit 4.1), which had a high potential for releases to soil, surface water, and air; and the tanks of the cooling water treatment system (Units 4.7, 4.9, and 4.10) which had high air release potentials based on their open-topped construction. Additionally, the chromate reduction tank (Unit 4.7) has both past and ongoing potential for soil releases due to overflow to an unpaved area beneath the tank. Another SWMU of concern is the oil/water separator (Unit 4.4), which has both a past and ongoing release potential to soil, surface water, and air.

INTRODUCTION

Pacific Gas and Electric Company (PG&E) owns and operates the Topock Compressor Station near Needles, California. The facility has been operating under an Interim Status Document since 1981. In response to a formal request by EPA in May, 1985 to submit a RCRA Part B Permit Application, the facility decided to close their hazardous waste management units and submitted a Closure Plan in November, 1985.(2)

The 1984 RCRA amendments provided new authority to EPA to require comprehensive corrective action on solid waste management units (SWMUs) and other areas of concern at facilities applying for Part B permits and those with RCRA interim status. The intent of this authority is to address previously unregulated releases of hazardous constituents to air, surface water, soil, and groundwater, and the generation of subsurface gas. In order to accomplish this objective, a RCRA facility assessment is undertaken which consists of a preliminary data review, a site visit, and when warranted, sampling and analyses.

This report represents an evaluation of SWMUs at the PG&E Topock Compressor Station and, as such, summarizes the results of a records review, data evaluation, and visual site inspection performed on the facility. Primary sources of information utilized for this review include the Closure Plan; RCRA and CERCLA files of EPA, Region 9; and files and inspection reports at the California Department of Health Services (DOHS) and the California Regional Water Quality Control Board (RWQCB), Colorado River Basin Region. A visual site inspection was conducted at the PG&E Topock Compressor Station on June 17, 1987, to verify file information and observe current conditions of the SWMUs.

Section 2.0 of this report describes the facility and its operations. In addition, a brief history of waste management practices and regulatory activities are provided. Section 3.0 provides an overview of the environmental setting. The solid waste management units are individually described in detail in Section 4.0. Finally, Section 5.0 summarizes the findings of the preliminary file review and visual site inspection.

2.0 FACILITY DESCRIPTION

2.1 GENERAL DESCRIPTION

The Pacific Gas and Electric Company (PG&E) owns and operates a natural gas compressor station approximately 14 miles southeast of Needles, California, near the Colorado River in San Bernardino County (Figures 1 and 2).(1) The compressor station, known as the Topock Compressor Station, consists of 10 natural gas compressor units with a total combined output of 35,000 horsepower.(1,2,3) Natural gas from out-of-state sources is compressed at the Topock Station for transmission to PG&E markets in Northern California.(1,4) The station, which is operated 24 hours per day, handles one-third of PG&E's total natural gas supply.(1,2) The station has been in operation since 1951.(5)

Process and cooling water for all plant operations is obtained from three water wells in Topock, Arizona.(1,2) The water is pumped through a six-inch line to two aboveground storage tanks (25,000 gallons each) located on a hill south of the compressor station.(2)

2.2 COOLING WATER SYSTEM

The compressor station has two wet, recirculating cooling towers which provide cooling of both the hot compressed natural gas leaving the compressor engines and the lubricating oils used for the compressor engines.(1,2,3) The two cooling towers are designated by the facility as the south cooling tower "A" and the north cooling tower "B" (Figure 3).(2) Cooling tower "A" was constructed in 1951 and cooling tower "B" in 1953.(2) Each cooling tower is approximately 38 feet high, 96 feet long, and 34 feet wide, and constructed of wood with corrugated fiberglass siding.(2)

In recirculating cooling water systems, constituents in the circulating water can become concentrated due to evaporative water losses. The concentrated constituents can cause scaling, corrosion, and biological fouling in the heat exchange equipment and cooling tower, resulting in a loss of heat transfer efficiency or damage to the equipment. To reduce the occurrence of these

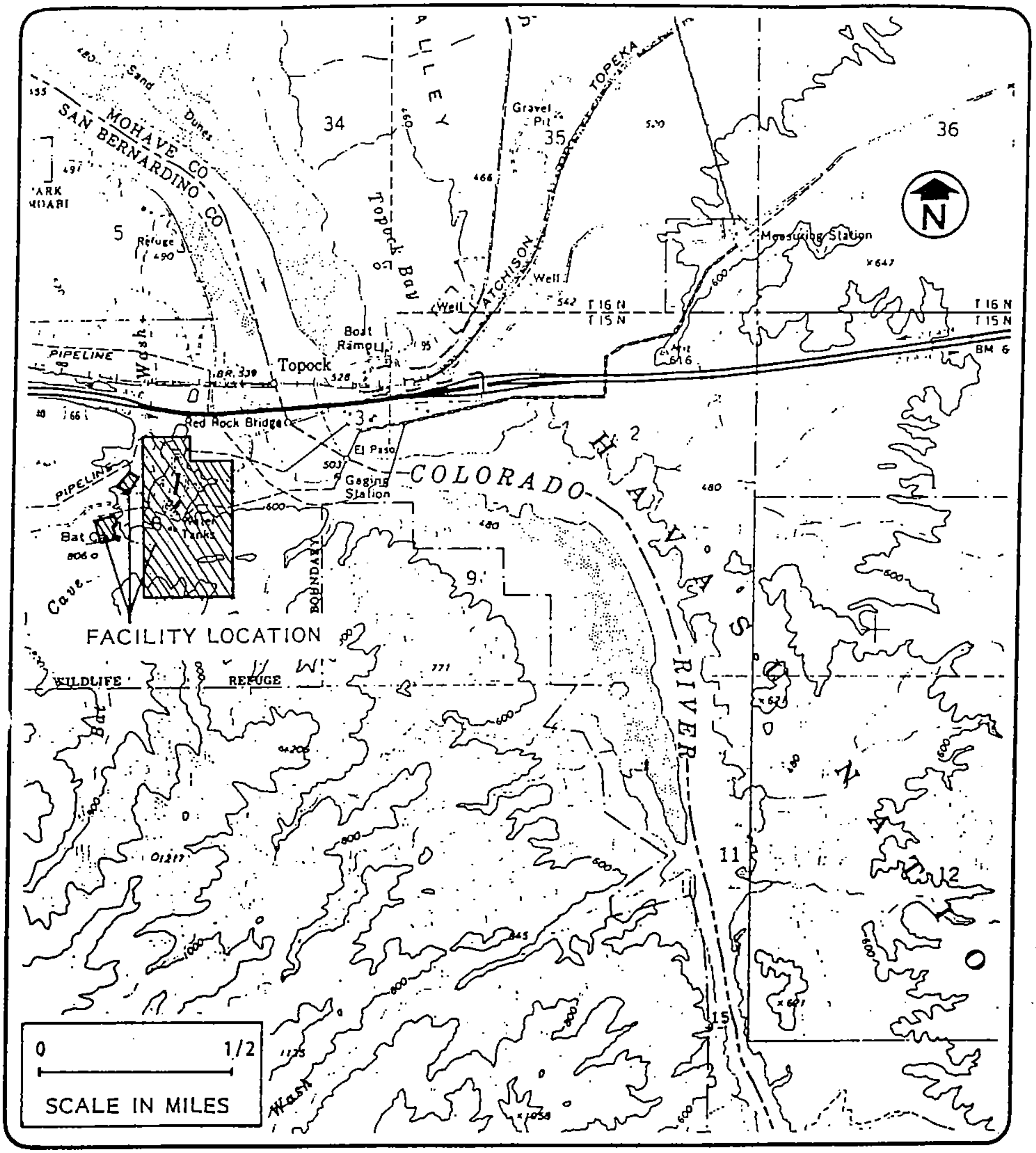


Figure 1

REGIONAL LOCATION OF THE TOPOCK COMPRESSOR STATION
Source: USGS 7.5' Quad
Topock AZ-CA, 1970.

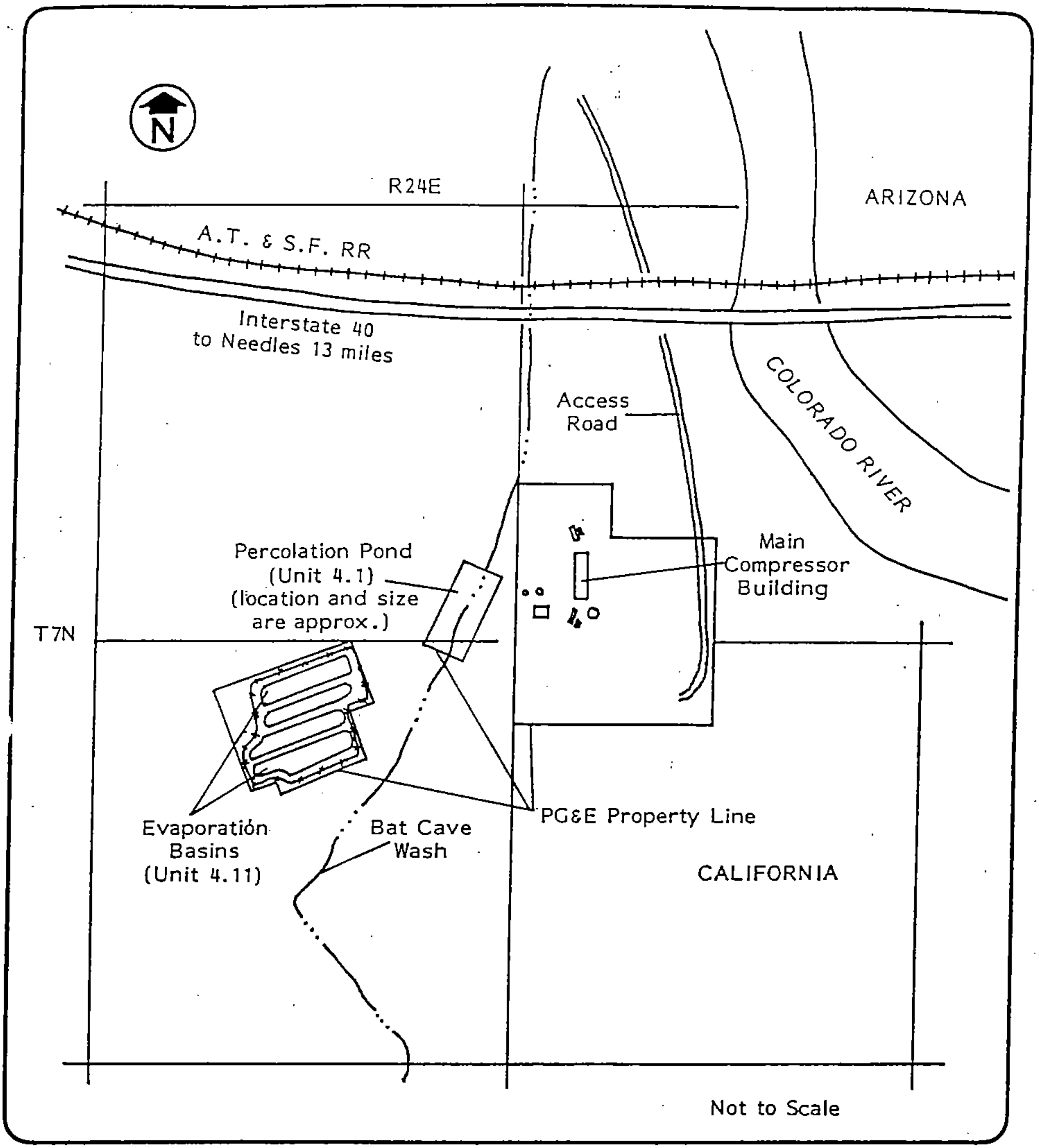


Figure 2

TOPOCK COMPRESSOR STATION SWMUs
Source: (2)

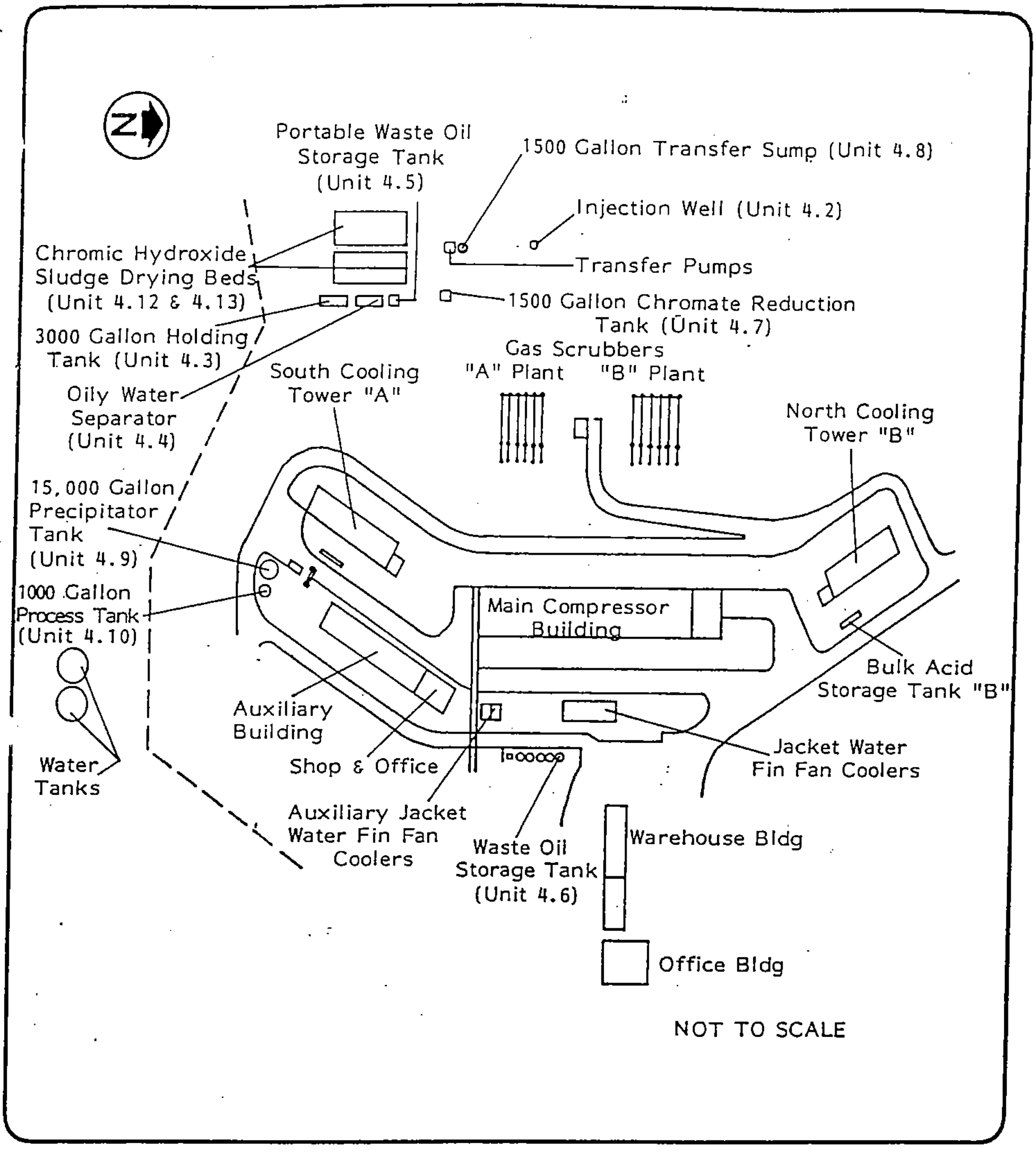


Figure 3

TOPOCK COMPRESSOR STATION SWMUs
Sources: (2,19)

problems, a portion of the recirculating water is discharged continuously from the cooling tower to control the concentration of the problem-causing constituents in the water. This is referred to as blowdown. In addition, chemicals are added to the makeup water (water replacing losses due to evaporation and blowdown) to assist in controlling these water quality problems. Blowdown from the Topock Compressor Station cooling towers is continuous at an average rate of 13,432 gallons per day (gpd) from each tower.(6) Maximum combined discharges from the cooling towers are 30,000 gpd.(2)

Since the time the cooling towers were placed in operation (1951 and 1953) until October, 1985, the PG&E Topock Compressor Station employed a water treatment program for the cooling water system in which a proprietary corrosion inhibitor containing hexavalent chromium was added to the makeup water.(2,5,6) In addition, sulfuric acid was added to the makeup water to control the pH and a proprietary, nonoxidizing biocide added to reduce microbiological growth.(2) As a result of this water treatment program, cooling tower blowdown became a hazardous wastewater as it contained approximately 10 ppm hexavalent chromium.(2,7)

In October, 1985, the Colorado River Basin Regional Water Quality Control Board (RWQCB) allowed PG&E to replace the chromium-based cooling water treatment program with a nonhazardous phosphate-based water treatment program.(2) This program utilizes proprietary orthophosphate and polyphosphate corrosion inhibitors in place of the chromium corrosion inhibitors.(2) Additionally, proprietary scale inhibitors and nonoxidizing biocides, and sulfuric acid for pH control, are added to the makeup water as part of this cooling water treatment program.(2)

2.3 HISTORY OF WASTE MANAGEMENT PRACTICES

From 1951 to 1969, untreated cooling tower blowdown (containing chromium) was discharged to a percolation bed (Unit 4.1) just west of the compressor station, in the vicinity of Bat Cave Wash.(5,8) PG&E estimated that approximately six million gallons of this wastewater were discharged to the percolation bed each year during this period of time.(5,8) In addition, PG&E estimated that the total chromium concentration, which included hexavalent chromium, in the cooling water wastewater was 10 ppm.(5,8)

In 1969, PG&E began treating the cooling tower blowdown using a two-step process. The wastewater was first treated using sulfur dioxide to reduce hexavalent chromium to trivalent chromium. Second, sodium hydroxide was added to precipitate the trivalent chromium as a chromic hydroxide sludge.(5,8) This treated wastewater was also discharged to the percolation bed from 1969 to 1970.(5,8)

From 1970 to 1974, the cooling tower blowdown was treated using the two-step process, but in addition, a proprietary flocculant and ferric sulfate were used to further enhance the removal of chromium from the wastewater by precipitation.(5,8) This treated wastewater was pumped into an underground injection well (Unit 4.2) for disposal.(5,8) The injection well, closed and capped in 1974, was not regulated by any agency.(5)

During the period from 1974 to 1985, cooling tower blowdown was treated using the two-step process and discharged to four evaporation ponds (Unit 4.11). (2,5) The use of the flocculant and ferric sulfate was discontinued in 1975. (5) Settled solids were periodically removed from the evaporation ponds and trucked offsite to the City of Needles Landfill (formerly the San Bernardino County Landfill), three miles south of Needles.(5) In 1984, the DOHS disallowed this practice of landfilling the pond solids.(5) As a result of the DOHS action, the solids were then disposed in an approved Class I disposal site from 1984 through 1985.(5)

PG&E estimated that the volume of chromic hydroxide sludge generated at the Topock Compressor Station by this two-step treatment process from 1969 to 1985 was relatively constant and averaged approximately 15,000 gallons per year.(8) No information was provided by PG&E concerning the disposal of the chromic hydroxide sludge generated during the period of time from 1969 through 1974.(5) From 1974 to May, 1985, the sludge was removed from the wastewater treatment system (precipitator tank) and piped to two drying beds (Units 4.12 and 4.13). After dehydration, the sludge was transported to an EPA-approved hazardous waste disposal facility by a registered hazardous waste hauler.(3,7) From May, 1985, to October, 1985, the chromic hydroxide sludge was directly pumped from the precipitator tank and transported to an EPA-approved hazardous waste disposal facility.(2,3,7)

The use of the two-step wastewater treatment process was discontinued in October, 1985 when PG&E substituted the phosphate-based corrosion inhibitors for the chromium-based corrosion inhibitors in their makeup water treatment program. (2) As a result of this program change, no hazardous wastes have been generated from the cooling towers since that time.(2) Cooling water blowdown is directly discharged to the evaporation ponds without treatment, hence, the wastewater treatment system for chromium removal became obsolete.(2)

Other wastewaters generated at the Topock Compressor Station include compressor condensate, floor drainage, and spent non-halogenated solvents from equipment maintenance.(3) These wastewaters are collected in a 3000-gallon holding tank (Unit 4.3) and routed to an oil/water separator (Unit 4.4) for treatment. Effluent from the oil/water separator is then discharged to the chromate reduction tank of the cooling tower wastewater treatment system.(2)

The Topock Compressor Station also operates a septic tank and leach field system for the treatment and disposal of sanitary wastes.(13) This system is located near the office building.(19)

Currently, the facility generates hazardous wastes which are disposed offsite. These wastes are primarily oils and oil filters generated from the compressors. (4) Depending upon the facility's mode of operations, between 14,000 to 21,000 gallons of used oil and approximately 24 to 55 gallons of used oil filters are generated per year.(4) The waste oil is transported for recycling to an independent private recycler.(4) Other solid wastes generated from the station include aerosol cans, oily rags, waste paints, pipe line liquids, scrubbers, pipe cuttings containing asbestos, and waste mercury from discarded instruments. These wastes are collected by a registered hauler and disposed offsite at an approved disposal facility.(19) No waste accumulation area could be identified during the VSI.

2.4 WASTEWATER TREATMENT SYSTEM

The wastewater treatment system for removing chromium from cooling tower blowdown operated from 1969 through October, 1985. The components of this system included a 1500-gallon chromate reduction tank, 1500-gallon transfer sump, 15,000-gallon precipitation tank, 1000-gallon process pump tank, and transfer pumps.(2)

The first treatment step was the reduction of the chromium ion from its hexavalent state to its trivalent state. This process was accomplished in the chromate reduction tank (Unit 4.7) where sulfur dioxide gas was injected and mixed with the wastewater to maintain the pH between 2.9 and 3.2.(2,6) After chromate reduction, the wastewater was piped to the transfer sump (Unit 4.8), from which it was pumped to the second treatment step.(2)

The second treatment step was the precipitation of the trivalent chromium. This step was accomplished in the precipitator tank (Unit 4.9) where liquid sodium hydroxide was added and mixed with the wastewater to maintain the pH between 6.7 and 7.2.(6) In this pH range, the trivalent chromium combined with hydroxide ions to form a chromate hydroxide precipitate.(2,6)

After completion of this two-step process, the wastewater contained less than 1 ppm total chromium and had a pH of about 7.0.(2,7) The wastewater was then transferred to a process pump tank and pumped to the four evaporation ponds.(2)

2.5 REGULATORY HISTORY

PG&E submitted RCRA Notification of Hazardous Waste Activity on August 18, 1980, and a Part A Permit Application on November 17, 1980, to EPA, Region IX, for their hazardous waste management activities at the Topock Compressor Station.(8) The facility also applied for interim status on November 19, 1980, to store and dispose of chromium wastes in evaporation ponds.(9)

On April 6, 1981, the DOHS issued an Interim Status Document (ISD) for the Topock Compressor Station.(8,9) A condition of the ISD required PG&E to install a groundwater monitoring system around the evaporation ponds.(9) PG&E submitted to DOHS in April, 1982, a request to waive the RCRA groundwater monitoring requirements contained in their ISD.(10) However, no action was taken on this issue until early 1985 when DOHS denied the request.(10) PG&E began the implementation of a groundwater monitoring system in October, 1985, with the installation of three wells.(2)

PG&E received a formal request from EPA, Region IX, on May 8, 1985, to prepare a RCRA Part B Permit Application for their Topock Compressor Station.(2,11) The permit application was to be submitted on November 8, 1985.(2,11) After review of applicable regulations affecting the operation of Topock Compressor Station's hazardous waste management facilities, PG&E decided to close these facilities.(2) PG&E submitted a closure notice to EPA on September 6, 1985, and the first submittal of a Closure Plan on November 7, 1985.(2) The Closure Plan was later revised to incorporate DOHS and RWQCB comments and resubmitted in August, 1986.(2)

In June, 1986, PG&E notified EPA, DOHS, and RWQCB of their selection of alternative closure procedures. This selected plan was to construct new Class II ponds at a new site followed by closure of the existing evaporation ponds.(2) In addition, the cooling tower wastewater treatment units and sludge drying beds would be closed.(2) The facility began some closure activities of the wastewater treatment units and sludge drying beds in October, 1985, although PG&E is currently awaiting DOHS approval of the closure plan before conducting final closure of these units and the evaporation ponds.(19) The evaporation ponds currently receive non-hazardous cooling tower blowdown.(19)

The wastewater discharges into the evaporation ponds were permitted by RWQCB under Board Order No. 75-52, issued on November 20, 1975.(6,8) PG&E notified the RWQCB of their intention to replace the chromium-based cooling water treatment program with a phosphate-based program in August, 1985.(7) The water treatment program change was approved and the conversion completed in November, 1985.(2) Although this conversion resulted in a non-hazardous wastewater discharge from the cooling towers, the wastestream is still subject to California State regulations which require groundwater monitoring and liners due to the high total dissolved solids concentration of the wastewater.(10)

2.6 SOLID WASTE MANAGEMENT UNITS

As a result of this RCRA facility assessment, a total of 16 solid waste management units (SWMUs) have been identified at the PG&E Topock Compressor Station. These SWMUs are shown on Figures 2 and 3 and listed below:

- Unit 4.1 Percolation Pond
- Unit 4.2 Injection Well
- Unit 4.3 Oil/Water Holding Tank
- Unit 4.4 Oil/Water Separator

Unit 4.5 Portable Waste Oil Storage Tank (Identified during VSI)
Unit 4.6 Waste Oil Storage Tank (Identified during VSI)
Unit 4.7 Chromate Reduction Tank - RCRA Regulated
Unit 4.8 Transfer Sump - RCRA Regulated
Unit 4.9 Precipitator Tank - RCRA Regulated
Unit 4.10 Process Pump Tank - RCRA Regulated
Unit 4.11 Four Evaporation Ponds - RCRA Regulated
Unit 4.12 East Chromic Hydroxide Sludge Drying Bed - RCRA Regulated
Unit 4.13 West Chromic Hydroxide Sludge Drying Bed - RCRA Regulated

3.0 ENVIRONMENTAL SETTING

3.1 SITE LOCATION

The Pacific Gas and Electric Topock Compressor Station is located in the eastern part of San Bernardino County, approximately 14 miles southeast of Needles, California (Figure 1).(15) PG&E owns three parcels of property. One includes the compressor station itself and associated units, the second parcel includes the evaporation ponds, and the third includes the inactive percolation bed (Figure 1).(2) All three parcels combined occupy 265 acres.(2)

3.2 TOPOGRAPHY AND METEOROLOGY

The PG&E Topock facility is located at the northern edge of the Chemehuevi Mountains in southern California near the Arizona border. The site slopes to the north with elevations ranging from 500 to 800 ft MSL (Figure 1). The site is situated in a series of hills and valleys at the foot of the mountain range. The site is about 0.5 miles east of the Colorado River.

The area in which the compressor station is located is an extremely arid area, with very little rainfall.(16) The area is characterized by hot summers, and cool winters with little precipitation in either season, other than thunderstorms. Evapotranspiration far exceeds precipitation.

3.3 SURFACE HYDROLOGY

The site is bisected by a major surface drainage called Bat Cave Wash.(16) Bat Cave Wash is a deep narrow gully which originates in the Chemehuevi Mountains and flows northeast into the Colorado River, located approximately one-half mile east of the compressor station.(15,16)

Surface water is present at the site only during rare precipitation events.(16) Flash flood runoff flows into the Bat Cave Wash and is abruptly diverted near the compressor station to the east through a steep-sided arroyo, hence, bypassing the evaporation ponds.(16) No portions of the site are known to be in a 100-year floodplain.

3.4 GEOLOGY AND HYDROGEOLOGY

The compressor station complex is located in the southern portion of the Mohave Valley and the northern region of the Chemehuevi Mountains, dissected by a Piedmont slope.(1,15) The bedrock complex, exposed in the surrounding hills, is composed of metadiorite, gneiss, and minor mica schist.(15)

The major geologic units encountered in the subsurface include (in order of decreasing depth): (1) a highly fractured bedrock basement complex consisting of metadiorite and gneiss, encountered at a maximum depth of 235 feet; (2) a well cemented fanglomerate, 0 to 50 feet thick; (3) older alluvial fan deposits, comprised of gravelly sands and sandy gravels, 100 to 150 feet thick; (4) Chemehuevi Formation consisting of fine grained reddish sands and minor gravels, 35 to 50 feet thick; and (5) recent alluvial fan deposits, 0 to 19 feet thick.(1,16)

Logs of several monitoring wells installed along the north perimeter of Pond 1 have shown that at least 100 feet of gravelly sand are encountered before bedrock of metadiorite is reached. Cross sections through the area of hte ponds show the ground surface to be situated at 670-700 ft MSL. Bedrock slopes steeply away from the outcrop east of the four ponds. Bedrock at MWP-7 on the west side of the ponds is encountered at 575 feet MSL, whereas bedrock at MWP-3 and MWP-8 is found at 475 feet MSL, and finally a maximum depth to bedrock of 425 feet MSL is reached at MWP-10 east of the ponds (Figure 4).

Typical fill material described in the boring logs is fine to medium sand with gravels derived from weathered bedrock. Extensive lateral variation is observed in the boring logs. The tertiary fanglomerate in contact with bedrock was not encountered in the monitoring well borings, but was encountered in piezometers P1 and P2 in thicknesses of 50 and 35 feet, respectively. Erosional processes were hypothesized to have removed the fanglometerate north and west of P1 and P2.(16) Overlying the bedrock is a gradually thickening section of alluvial fan deposits of gray to brown, poorly sorted, sandy gravel and gravelly sand beds. A 50-foot thick sand bed is observed in MWP-1, expanding to a thickness of 100 feet at MWP-10. The Chemehuevi Formation lies above the alluvial fan; it ranges in thickness from 29 feet in MWP-7 to 45 feet in MWP-1 and MWP-10. This formation consists of reddish brown sand occasionally

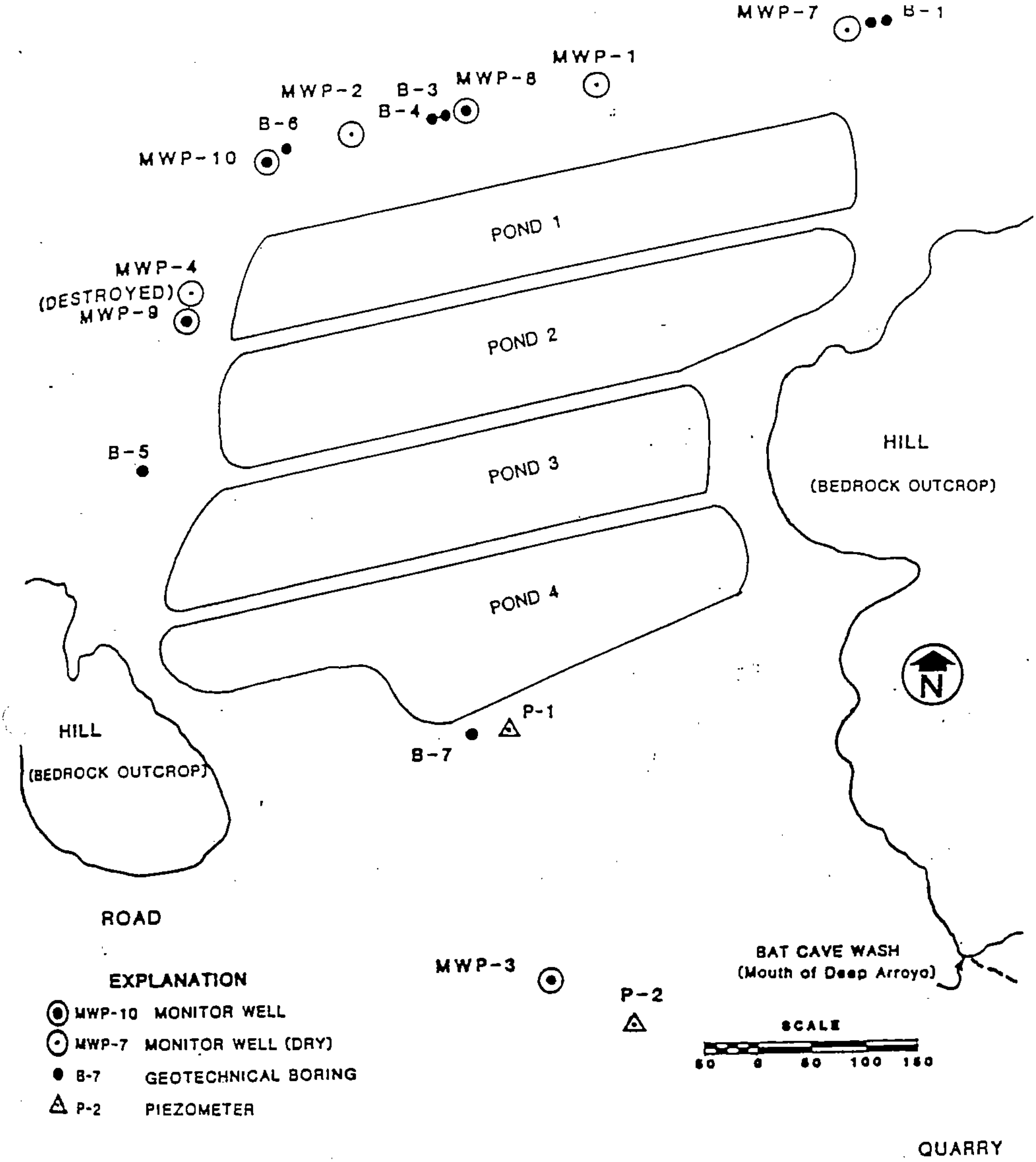


Figure 4

TOPOCK COMPRESSOR STATION
EVAPORATION POND AREA
BORING LOCATION MAP
Source: (16)

with moist, stiff, greenish to reddish brown clay.(16) The clay laterally continuous north of the ponds, but not positively outh of the ponds. Surficial deposits overlie the Chemehuevi and are comprised of recent alluvial fans. This deposit does not ickness of deposition which can be attributed to the slope of the bedrock, unlike the aforementioned units. This may be due to ional processes to which surface sediments are exposed.(16)

ite, fanglomerate, and older alluvial fan deposits are considered nits containing significant amounts of groundwater in the evapora- rea, and hence, comprise the aquifer system.(16) High moisture observed at the alluvium/bedrock contact, suggesting that this may provide a recharge path for groundwater.(16) Groundwater encoun- e metadiorite was confined to moist zones associated with fracture 16)

y units comprising the aquifer include sandy gravels, gravelly sands, fanglomerate.(16) The fanglomerate is considered less permeable old alluvium due primarily to calcareous cementation.(16)

er monitoring program has been developed for the evaporation ponds. data obtained from this monitoring program, groundwater is unconfined ater table roughly parallelling the alluvium/bedrock contact.(17) r table slopes to the north at a gradient of about 0.1 ft/ft.(17) to groundwater from the ground surface ranges from approximately 100 et.(17)

DWATER MONITORING

oped a groundwater monitoring program for the Topock Compressor four evaporation ponds in response to ISD requirements.(16) During from July, 1985 to February, 1986, a total of 17 borings were igure 4).(16)

rings drilled in the vicinity of the ponds provided information to riz the subsurface geology and hydrology.(16) Of these borings, e completed as monitoring wells, two as piezometers, and seven were

4.0 DESCRIPTION OF INDIVIDUAL UNITS

4.1 PERCOLATION BED

4.1.1 Information Summary

Unit Description: This inactive percolation bed is located just west of the compressor station, in the Bat Cave Wash channel (Figure 2).(5,12,19) The percolation bed was approximately 200 to 300 feet long and 50 to 75 feet wide and surrounded by a berm on all four sides.(19) The exact boundaries of this unit could not be determined during the visual site inspection.

The percolation bed was used from 1951 to 1969 for the disposal of untreated cooling tower blowdown containing chromium.(5) PG&E estimated that approximately six million gallons of wastewater were disposed in this manner each year during this period.(5) From 1969 through 1970, the cooling tower blowdown was treated to remove chromium prior to discharge to the percolation bed.(5)

In a preliminary assessment report by DOHS in October, 1985, DOHS recommended that a study be undertaken to determine if groundwater contamination has occurred as a result of this waste management practice.(5) This unit is currently part of a DOHS investigation under the State Superfund Program. As a result of this investigation, PG&E completed a sediment sampling and analysis plan for the percolation bed and Bat Cave Wash in September, 1986.(20) The plan was submitted to DOHS for regulatory guidance and oversite. PG&E is awaiting DOHS approval of the plan and as such, no sampling has been conducted to date.(21)

Date of Startup: The percolation bed was placed into service in 1951.(5)

Date of Closure: The use of this unit was discontinued in 1970.(5) No soil excavation or other closure activities have taken place for this unit.(19)

Wastes Managed: Cooling tower wastewater discharged into the bed from 1951 to 1969 contained an estimated total chromium concentration of 10 ppm.(5) The total chromium concentration in the wastewater discharged from 1969 to 1970 is unknown.

Release Controls: The percolation bed was surrounded by berms.(12) The berms were two to three feet high and constructed of native soils.(19) The berm was removed at unknown dates. In a 1981 CERCLA Notification, the facility indicated that only the western portion of the berm was still intact, the other three sides of the berm had been removed.(12) The western portion of the berm was absent at the time of the VSI.(19)

History of Releases: This unit was a percolation bed which was designed for release to soil. There was no file evidence of unintentional releases from the percolation bed. In addition, no evidence of releases was observed during the VSI.

4.1.2 Conclusions

Soil/Groundwater Release Potential: The percolation bed was designed for release to soil. Information on the site-specific hydrogeology for the percolation bed area, with regard to soil permeability and depth to groundwater, is nonexistent, hence, the groundwater release potential cannot be adequately evaluated.

Surface Water Release Potential: The integrity of the berms could not be verified during the VSI, although the location of the percolation bed in the Bat Cave Wash channel makes it likely that surface water releases occurred during rainfall events while the unit was in operation. There is a potential for ongoing releases to surface waters during rainfall events if contamimated soils remain in the area.

Air Release Potential: Due to the arid climate, past air releases from the percolation bed were likely to have occurred by evaporation. There is no potential for ongoing air releases as the unit is inactive.

Subsurface Gas Release Potential: Due to the inorganic nature of wastes disposed in the percolation bed, there is no potential, past and ongoing, for the generation of subsurface gas from this unit.

4.2 INJECTION WELL

4.2.1 Information Summary

Unit Description: This inactive injection well is located near the chromium reduction tank, just west of the main compressor building (Figure 3).(1) The injection well was drilled in 1969 and first used in 1970 for the disposal of treated cooling tower blowdown.(1,5) The well was designed and constructed to discharge wastewater below the uppermost aquifer and into a groundwater basin that was determined unsuitable for domestic or agricultural uses.(8) The unit did not operate under any Federal or State agency permits.

The injection well was drilled to a depth of 550 feet and constructed of a solid steel casing to a depth of 400 feet and a perforated steel casing from 400 to 550 feet.(8)

The use of the injection well was discontinued in 1974 because the permeability of the soil formation surrounding the perforated well casing was reduced to a point where it would not accept the volume of water being disposed.(8) The well was then closed and capped, and piping to the well disconnected.(5,8,19)

Groundwater monitoring has not been conducted to determine if this waste disposal practice has caused any contamination of aquifers above the basin into which wastes were injected.(1) The injection well is part of a DOHS investigation under the State of California Superfund Program, although no sampling and analyses plans have been submitted by the facility for this particular unit.(21)

Date of Startup: The use of this injection well began in 1970.(1,5)

Date of Closure: The unit became inactive in 1974.(5) According to the facility, the well has been capped but not abandoned.(19)

Wastes Managed: Cooling tower blowdown was treated to remove chromium prior to injection into the well.(5) No chemical analyses of treated wastewater demonstrating the effectiveness of the treatment process in removing chromium were available for this review.

Release Controls: The injection well was constructed with a solid steel casing to a depth of 400 feet to prevent the discharge of wastewater into the uppermost aquifer.(8) In addition, cement grout was poured between the soil formation and the solid steel casing down to a depth of 400 feet.(8)

History of Releases: There was no file record of releases from this unit.

4.2.2 Conclusions

Soil/Groundwater Release Potential: The unit was designed for discharge into a lower, unusable aquifer. Release to the soil/rock strata and aquifer between 400-550 ft have occurred. It is unknown if the upper and lower aquifers are hydraulically connected, as well log data for this particular well were not available. Hence, the groundwater release potential to the upper aquifer cannot be adequately evaluated. There is no potential for ongoing releases to groundwater as the well is inactive.

Surface Water Release Potential: Based upon the unit design for injection into the groundwater, there is no potential, past or ongoing, for surface water releases.

Air Release Potential: Based upon the unit design for injection into the groundwater, there is no past or ongoing potential for releases to air.

Subsurface Gas Release Potential: Due to the inorganic nature of wastes disposed in the injection well, there is no past and ongoing potential for the generation of subsurface gas from this unit.

4.3 OIL/WATER HOLDING TANK

4.3.1 Information Summary

Unit Description: The oil/water holding tank is located in the western portion of the facility property, just west of the main compressor building (Figure 3).(2) This holding tank collects approximately 200,000 gallons from compressor building floor drainage, 10,000 gallons from compressor engine cleaning operations, and 10,000 gallons from steam cleaning operations each year.(19,20) Contents of the holding tank are routed to the oil/water separator (Unit 4.4) for treatment.(2)

This steel, cylindrical holding tank is approximately 15 feet long and 5 feet in diameter, with a capacity of 3000 gallons.(19) This tank is mounted horizontally on two concrete supports.(19) The area underneath the tank is unpaved.(19)

Date of Startup: This holding tank was installed in 1970.(20)

Date of Closure: The oil/water holding tank is an active unit.(2,19)

Wastes Managed: Chemical analyses for hazardous constituents of the process wastewaters discharged into this holding tank were unavailable for this review. However, it is expected that these wastes contain 40 CFR 261, Appendix VIII constituents, typical of complex hydrocarbons.

Release Controls: Influent wastewaters are routed through a three-inch PVC pipe to the top of the tank. Effluent flows by gravity from the bottom of the tank through a three-inch steel pipe to the oil/water separator. This discharge is manually controlled with a valve.(19) The tank is also equipped with an overflow pipe at the top to discharge wastewaters to the oil/water separator and an overflow level-activated alarm system.(19)

History of Releases: There was no file evidence of releases from this holding tank. Additionally, no indications of spills or leaks were observed during the VSI.

4.3.2 Conclusions

Soil/Groundwater Release Potential: The tank's construction and operating conditions minimize the potential for releases, both past and ongoing, to soil and groundwater.

Surface Water Release Potential: The surface water release potential, both past and ongoing, is low, based on the unit's construction and operating conditions.

Air Release Potential: Based upon the tank's closed cylindrical construction, the potential for past and ongoing releases to air is extremely low.

Subsurface Gas Release Potential: Based on the unit's above-ground construction and operating conditions, there is no potential for the generation of subsurface gas from this tank.

4.4 OIL/WATER SEPARATOR

4.4.1 Information Summary

Unit Description: The oil/water separator is located in the western portion of the facility property, adjacent to the oil/water holding tank (Unit 4.3) (Figure 3).(2) The oil/water separator is approximately 4.5 feet deep, 15 feet long, and 6 feet wide, and constructed of six-inch thick concrete.(19) This unit is equipped with an underflow weir to control discharges, and a suction pump on the effluent end to collect floating oils.(19) Floating oils are removed by the suction pump and routed to a small portable waste oil storage tank (Unit 4.5) adjacent to the oil/water separator.(19)

This unit receives process wastewaters from the oil/water holding tank.(2) From 1974 through October, 1985, treated effluent from the oil/water separator was discharged by gravity flow to the chromate reduction tank (Unit 4.7) for additional treatment in the wastewater treatment system, with ultimate disposal to the evaporation ponds.(19) In November, 1985, the chromate reduction tank was converted into a holding tank. Since that time, oil/water separator effluent has been routed to this holding tank or the transfer sump (Unit 4.8) prior to final discharge to the evaporation ponds.(19) The diposition of oil/water separator effluent prior to the construction of the evaporation ponds is unknown.

Date of Startup: The oil/water separator was installed in 1951.(20)

Date of Closure: The oil/water separator is an active unit.(19)

Wastes Managed: Chemical analyses for hazardous constituents of the process wastewaters discharged from the holding tank into the oil/water separator were unavailable for this review. However, it is expected that these wastes contain 40 CFR 261, Appendix VIII constituents, typical of complex hydrocarbons.

Release Controls: Effluent discharges are controlled by an underflow weir.(19) The area around the unit is not paved or bermed.(19)

History of Releases: There was no file evidence of releases from this unit. However, oil stains were noted on the outside walls of the separator and on the ground surface surrounding the unit during the VSI.

4.4.2 Conclusions

Soil/Groundwater Release Potential: Releases to surface soils have occurred from this unit as observed during the VSI. Information on the site-specific hydrogeology for this waste treatment area, with regard to soil permeability and depth to groundwater, is not available, hence, the groundwater release potential cannot be adequately evaluated.

Surface Water Release Potential: Since soil releases have occurred, there is a low to medium potential for release, both past and ongoing, to surface water during rainfall events based on the close proximity of this unit to Bat Cave Wash.

Air Release Potential: There is a high potential for past and ongoing releases of the volatile components of the waste to air due to the open-topped construction of this unit.

Subsurface Gas Release Potential: There is a potential for the generation of subsurface gas, both past and ongoing, with the occurrence of subsurface anaerobic conditions, as releases to soil have occurred from this unit.

4.5 PORTABLE WASTE OIL STORAGE TANK (Identified during VSI)

4.5.1 Information Summary

Unit Description: This storage tank is located in the western portion of the facility property, adjacent to the oil/water separator (Unit 4.4) (Figure 3). (19) This tank is a closed steel cylinder, approximately two feet in diameter and six feet in length.(19) The tank is mounted horizontally on a trailer and is connected to the suction pump of the oil/water separator with a hose.(19) The area underneath the tank and trailer is concrete paved, approximately 10 feet x 8 feet in area, and bermed on three sides by a six-inch concrete curb.(19) The concrete pad is sloped toward the unbermed end to allow for the removal of the tank and trailer from this area.(19)

The tank collects floating oils from the oil/water separator.(19) When the tank has reached its storage capacity with accumulated oils, it is removed from this area and transported to the east end of the facility to the product oil and fuel tank storage area. The contents of this portable tank are then pumped into a larger waste oil storage tank (Unit 4.6), contained within this area.(19)

Date of Startup: The date that this unit was placed into operation is unknown.

Date of Closure: This tank is an active unit.(19)

Wastes Managed: Chemical analyses for hazardous constituents of the floating oils removed from the oil/water separator were unavailable for this review. However, it is expected that these wastes contain 40 CFR 261, Appendix VIII constituents, typical of complex hydrocarbons.

Release Controls: The area beneath the tank is concrete paved and bermed on three sides.(19)

History of Releases: There was no file evidence of releases from this unit. However, oil stains were noted on the concrete pad and curb during the VSI.

4.5.2 Conclusions

Soil/Groundwater Release Potential: There is a low potential for past and ongoing releases to soil and groundwater based on stains observed on the concrete pad and curb during the VSI.

Surface Water Release Potential: Based upon the unit's construction and the concrete pad and curb, the potential for release to surface water, both past and ongoing, is low.

Air Release Potential: The potential for past and ongoing releases to air is low due to the tank's closed cylindrical construction.

Subsurface Gas Release Potential: Based on the unit's above-ground construction and concrete pad, there is no potential for the generation of subsurface gas from this tank.

4.6 WASTE OIL STORAGE TANK (Identified during VSI)

4.6.1 Information Summary

Unit Description: This tank is located on the eastern end of the facility property within the contained product oil and fuel storage area (Figure 3).(19) The tank is a closed vertical cylinder, constructed of steel.(19) The tank is approximately 8 feet in diameter and 20 feet in height.(19)

Waste oils from the portable waste oil storage tank (Unit 4.5) and other waste oils generated on site are collected in this tank.(19) Tanks contents are periodically removed by a contractor and taken offsite for recycling.(19)

Date of Startup: The startup date of this tank is unknown.

Date of Closure: This tank is an active unit.(19)

Wastes Managed: This tank collects waste oils for offsite recycling.(19) Chemical analyses for hazardous constituents of these waste oils were not available for this review. However, it is expected that these wastes contain 40 CFR 261, Appendix VIII constituents, typical of complex hydrocarbons.

Release Controls: The tank is located witin the product oil and fuel storage area. This area is concrete paved, approximately 20 feet wide and 100 feet long, and is surrounded by a two-foot high concrete curb.(19)

History of Releases: There was no file evidence of releases from this unit. In addition, no indications of spills or leaks were observed during the VSI.

4.6.2 Conclusions

Soil/Groundwater Release Potential: The potential for releases to soil and groundwater, past and ongoing, is extremely low based on the concrete pavement and curbs.

Surface Water Release Potential: The surface water release potential, both past and ongoing, is minimized by the concrete containment.

Air Release Potential: There is an extremely low potential for air releases, past and ongoing, from this unit due to its closed cylindrical construction.

Subsurface Gas Release Potential: Based on the unit's above-ground construction and concrete containment, there is no potential for the generation of subsurface gas from this tank.

4.7 CHROMATE REDUCTION TANK

4.7.1 Information Summary

Unit Description: The chromate reduction tank is located on the western portion of the facility property, just west of the main compressor building (Figure 3).(2) The tank is approximately ten feet high and five feet in diameter, with a capacity of 1,500 gallons.(2,19) The tank is constructed of steel and has an open top.(2,19) The tank is partially below grade, situated in a pit with dimensions of 10 ft x 10 ft x 6 ft deep.(19) The pit is supported on four sides by wooden boards; the bottom of the pit is not paved or lined.(19)

This tank was used from 1969 through October, 1985, for the treatment of cooling tower blowdown containing chromium.(19) During this period, cooling tower blowdown flowed by gravity into this tank through a three-inch steel pipe.(6) A maximum combined flow of 30,000 gallons per day was discharged continuously from cooling towers into this tank.(2) Wastewater in this tank was injected with sulfur dioxide gas to maintain the pH between 2.9 and 3.2.(2) In this pH range, the hexavalent chromium was reduced to trivalent chromium.(6) The injection of the sulfur dioxide gas was regulated by a pH controller and solenoid valve.(6) Treated wastewater was then discharged by gravity flow through a three-inch steel pipe into the transfer sump (Unit 4.6).(2,6)

The cooling tower wastewater treatment system became inactive in October, 1985 as a result of the change to the phosphate-based cooling tower makeup water treatment program.(2) As part of this conversion process, the chromate reduction tank became a temporary holding tank in November, 1985, for cooling tower discharges and oil/water separator effluent prior to discharge into the evaporation ponds via the transfer sump.(2,19)

Date of Startup: This unit was placed into service in 1969.(5)

Date of Closure: This unit is currently used as a holding tank for cooling tower blowdown and oil/water separator effluent.(19)

Wastes Managed: The chromate reduction tank received cooling tower blowdown containing a chromium-based proprietary corrosion inhibitor from 1969 through October, 1985.(2) Wastewater samples were collected from both cooling towers and the chromate reduction tank and analyzed for total chromium and hexavalent chromium in October 1984.(2) Wastewater from cooling tower "A" had a total chromium concentration of 7.8 mg/l and a hexavalent chromium concentration of 6.0 mg/l.(2) Cooling tower "B" wastewater had a total chromium concentration of 2.6 mg/l and a hexavalent chromium concentration of 0.62 mg/l.(2) The total chromium and hexavalent chromium concentrations in the chromate reduction tank effluent were 23 mg/l and 0.42 mg/l, respectively.(2)

From about 1974 to the present, oil/water separator effluent has also been discharged into this tank.(19) Chemical analyses for hazardous constituents of the oil/water separator effluent were unavailable for this review. However, it is expected that these wastes contain 40 CFR 261, Appendix VIII constituents, typical of complex hydrocarbons.

Release Controls: The tank is equipped with a three-inch gravity feed line to the sump tank near the tank top to provide overflow protection.(6)

History of Releases: There was no file evidence of releases from this tank. In addition, no indications of spills or leaks were observed during the VSI.

4.7.2 Conclusions

Soil/Groundwater Release Potential: There is a potential for soil releases, past and ongoing, from this unit if overflows occur, as the area beneath the tank is unpaved. Information on the site-specific hydrogeology for this waste treatment area, with regard to soil permeability and depth to groundwater, is not available, hence, the groundwater release potential cannot be adequately evaluated.

Surface Water Release Potential: The potential for surface water releases, past and ongoing, is very low as any overflows would be contained within the pit.

Air Release Potential: Due to the arid climate and open-topped construction of the tank, there was a high potential for past air releases by evaporation during the period when this unit was used for chromium reduction. Of the mixture of wastes currently stored in this unit, only the oily effluent from the oil/water separator potentially contains hazardous constituents. These oily wastes are diluted with non-hazardous cooling tower blowdown, therefore, the ongoing air release potential is minimal.

Subsurface Gas Release Potential: Of the mixture of wastes currently stored in this unit, only the oily effluent from the oil/water separator could produce subsurface gas in anaerobic conditions. These oily wastes are diluted with cooling tower blowdown, therefore, the potential for the ongoing generation of subsurface gas from this unit is low. Prior to the discharge of oil/water separator effluent into this unit, there was no potential for the generation of subsurface gas as the wastes were inorganic.

4.8 TRANSFER SUMP

4.8.1 Information Summary

Unit Description: The transfer sump is adjacent to the chromate reduction tank on the west end of the facility property (Figure 3). This sump is constructed of six-inch thick concrete and has a capacity of 1500 gallons. (2,19) The sump is approximately three feet in diameter and 20 feet deep, of which 18.5 feet of its depth is below grade.(19) The sump is also equipped with a fitted concrete cover.(19)

From 1969 to October, 1985, effluent from the chromate reduction tank containing chromium was routed to the precipitator tank (Unit 4.9) via this transfer sump.(2,6) Since November, 1985, the sump has received wastewaters from the temporary holding tank (formerly the chromate reduction tank) which contains non-hazardous cooling tower blowdown.(19) Sump contents are now routed to the evaporation ponds.(19) After about 1974, oil/water separator effluent was also a component of the waste stream discharged into this sump, either directly or through the chromate reduction tank.(19) Final disposition of the oil/water effluent was the evaporation ponds.(19)

Oily sludges and solids accumulating in the sump are periodically removed and transported to an off-site disposal facility.(19)

Date of Startup: This unit was placed into service in 1969.(5)

Date of Closure: This sump is an active unit.(19)

Wastes Managed: The results of a sampling and analysis event in October, 1984, of effluent from the chromate reduction tank showed total chromium and hexavalent chromium concentrations of 23 mg/l and 0.42 mg/l, respectively.(2) Chemical analyses for hazardous constituents of the oil/water separator effluent were unavailable for this review. However, it is expected that these wastes contain 40 CFR 261, Appendix VIII constituents, typical of complex hydrocarbons.

Release Controls: The sump is equipped with a liquid level controller.(6) When the wastewater reaches a set level, a pump is activated to discharge the wastewater into the evaporation ponds.(19) Prior to November, 1985, the level activated pump discharged the sump contents to the precipitator tank (Unit 4.9).(6) In addition, when the sump contents reach an extreme level, cooling tower discharges are shut off with a solenoid valve in the cooling tower discharge line.(6)

History of Releases: There was no file evidence of releases from this sump. Additionally, there were no indications of overflow observed during the VSI.

4.8.2 Conclusions

Soil/Groundwater Release Potential: The release potential to soil from overflow conditions, both past and ongoing, is minimized by the sump level controllers. The release potential to soil and groundwater due to sump leakage cannot be determined as the sump's integrity could not be evaluated during the VSI.

Surface Water Release Potential: The sump's level controllers minimize the potential for past and ongoing surface water releases by overflow conditions.

Air Release Potential: As this unit is covered, there is no potential for air releases, past and ongoing, from this sump.

Subsurface Gas Release Potential: Although the sump's integrity could not be verified during the VSI, the potential for the generation of subsurface gas from this unit is low, based on the types of wastes discharged into this unit.

4.9 PRECIPITATOR TANK

4.9.1 Information Summary

Unit Description: The precipitator tank is located on the south end of the facility property (Figure 3).(2) This steel tank is approximately 13 feet in diameter and 15 feet in height, and has a capacity of 15,000 gallons.(2,6,19) The tank is open-topped and situated on a concrete pad, approximately 14 feet in diameter.(19)

The precipitator tank received wastewater from the chromate reduction tank via the transfer sump from 1969 through October, 1985.(2,19) In this tank, the wastewater was injected with sodium hydroxide to maintain the pH between 6.7 and 7.2.(6) In this pH range, the trivalent chromium combined with hydroxide ions to form a chromic hydroxide sludge, which settled to the bottom of the tank.(6) The injection of the sodium hydroxide was regulated by a pH controller.(6)

Treated effluent from the precipitator tank was routed to a process pump tank (Unit 4.10) prior to discharge to the evaporation ponds (Unit 4.11).(2,6) The settled sludge in the precipitator tank was pumped to two drying beds (Unit 4.12 and 4.13) from 1974 to May, 1985.(2,3,6,7) After dehydration in the drying beds, the sludge was transported to an approved hazardous waste disposal facility. (2,7) From May, 1985, to October, 1985, the sludge was directly pumped from the precipitator tank and transported to an approved hazardous waste disposal facility.(2,3,7) From 1969 through 1974, the settled sludge in the precipitator tank was allowed to accumulate.(19)

Date of Startup: The precipitator tank was placed into service in 1969.(5)

Date of Closure: This unit was taken out of service in October, 1985, as a result of the changes to the phosphate-based cooling tower makeup water treatment program.(2,19) At this time, the tank was cleaned and sampled.(19) The sampling results indicated that no chromium-containing wastes remained in the tank.(19)

Wastes Managed: The contents of the precipitator tank were sampled and analyzed in October, 1984.(2) The wastewater in the tank was found to contain 3.8 mg/l total chromium and 0.04 mg/l of hexavalent chromium.(2) Settled sludges were found to contain 37,500 mg/kg total chromium and 4 mg/kg hexavalent chromium.(2)

Release Controls: The precipitator tank is equipped with troughs located on the inside upper circumference of the tank to provide overflow protection.(6)

History of Releases: There was no file evidence of past releases from this unit. In addition, no indications of overflow or leaks were observed during the VSI.

4.9.2 Conclusions

Soil/Groundwater Release Potential: There was a low potential for past releases to soil and groundwater based on the tank overflow controls and concrete pad. As this unit is inactive, there is no potential for ongoing releases to soil or groundwater.

Surface Water Release Potential: The past surface water release potential was reduced by the tank overflow controls. There is no potential for ongoing releases to surface water as this tank is inactive.

Air Release Potential: Due to the arid climate and open-topped construction of the tank, there was a high potential for past air releases by evaporation. There is no potential for ongoing air releases as this unit is inactive.

Subsurface Gas Release Potential: Based on the inorganic nature of wastes treated in this tank, there was no potential for the generation of subsurface gas. The tank is inactive, and as a result, there is no ongoing potential for the generation of subsurface gas.

4.10 PROCESS PUMP TANK

4.10.1 Information Summary

Unit Description: The process pump tank is adjacent to the precipitator tank on the south end of the facility property (Figure 3).(2) This steel holding tank is approximately 5.5 feet in diameter and 8 feet high, and has a capacity of 1500 gallons.(2,6,19) The tank is open-topped and situated on a concrete pad, approximately 7 ft x 7 ft in area.(19)

The process pump tank was a holding tank for wastewaters discharged from the precipitator tank enroute to the evaporation ponds.(2,6)

Date of Startup: This unit became active in 1969.(5)

Date of Closure: This tank was taken out of service in October, 1985.(19) At that time, the pump tank was cleaned and sampled. Sampling results indicated that no chromium—containing wastes remained in the tank.(19)

Wastes Managed: Chemical analyses of wastewater in this tank were unavailable for this review, although it is expected that the wastewater characteristics are similar to that of the precipitator tank effluent.

Release Controls: The process pump tank was equipped with a liquid level controller.(6) When the wastewater in the tank reached a set level, the tank contents were pumped to the evaporation ponds.(6) In addition, when the tank contents reached an extreme level, cooling tower discharges were shut off with a solenoid valve in the cooling tower discharge line.(6)

History of Releases: There was no file evidence of releases from this unit. In addition, there were no indications of overflow or leaks observed during the VSI.

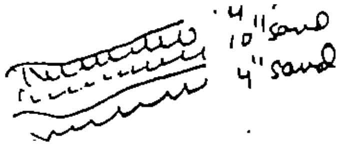
4.10.2 Conclusions

Soil/Groundwater Release Potential: There was a low potential for past releases to soil and groundwater based on the tank overflow controls and concrete pad. As this unit is inactive, there is no potential for ongoing releases to soil or groundwater.

Surface Water Release Potential: The past surface water release potential was reduced by the tank overflow controls. There is no potential for ongoing releases to surface water as this tank is inactive.

Air Release Potential: Due to the arid climate and open-topped construction of the tank, there was a high potential for past air releases by evaporation. There is no potential for ongoing air releases as this unit is inactive.

Subsurface Gas Release Potential: Based on the inorganic nature of wastes treated in this tank, there was no potential for the generation of subsurface gas. The tank is inactive, and as a result, there is no ongoing potential for the generation of subsurface gas.



4.11 FOUR EVAPORATION PONDS

4.11.1 Information Summary

Unit Description: There are four RCRA-regulated evaporation ponds located on the far west end of the facility property (Figure 2).(2) The ponds are designated as Ponds 1, 2, 3, and 4 by the facility with Pond 1 being the northernmost pond and Pond 4, the southernmost.(2)

The ponds occupy a total surface area of 181,000 square feet or 4.15 acres.(2) The ponds are lined with a 20-mil PVC synthetic liner underlain by 4 inches of sand, and overlain by 10 inches of sand and 4 inches of native soil.(2,3) The inside sloping surface of the berms surrounding the ponds was spray coated with asphalt to prevent erosion.(2,3) The ponds have a total depth of 6 feet.(2) When used for cooling tower blowdown, freeboard of one foot was maintained in the ponds instead of the required two feet as per waiver from the RWQCB.(2,3) Based upon a one-foot freeboard, the ponds have a total capacity of 4,900,000 gallons.(2)

The ponds are currently used for the disposal of the non-hazardous cooling tower blowdown. Pending DOHS approval, these ponds will be closed and new ponds constructed for cooling water disposal.(19) At the time of the VSI, only Ponds 2 and 4 contained wastewater.(19)

The settled solids in the ponds were periodically removed and transported offsite.(5) From 1974 through 1984, the solids were trucked to the City of Needles Landfill.(5) From 1984 to 1985, the solids were disposed in an approved Class I disposal site.(5) Prior to 1986, the evaporation ponds were used for the disposal of treated cooling tower blowdown.(2)

Date of Startup: Pond 1 was constructed in 1973.(2) The other three were constructed in 1974.(2) All four ponds were placed into service in 1974.(2,5)

Date of Closure: These ponds became inactive as RCRA-regulated units in October, 1985.(19) The ponds are currently used for the disposal of non-hazardous cooling tower blowdown.(19)

Wastes Managed: The results of two sampling events of evaporation pond wastewater and sludges are presented in Table 1.(2,12) Other heavy metals, particularly copper, are present in the sludge as well.(12)

Release Controls: The ponds are equipped with a resistance grid leak detection system which monitors the soil immediately underlying the ponds.(2) The ponds are also surrounded by earthern berms.(2,6) In addition, the inlet lines to the ponds were valved to permit isolation.(6) There were no discharge lines from the evaporation ponds.(6)

History of Releases: There was no file record of releases from this unit. Additionally, no indications of overtopping were observed during the VSI.

4.11.2 Conclusions

Soil/Groundwater Release Potential: The liners, leak detection system, and operating conditions all contributed to reduce the potential for past soil and groundwater releases from the ponds. No hazardous wastewaters are currently disposed in the ponds, therefore, there is no potential for releases to soil and groundwater.

Surface Water Release Potential: Due to the operating conditions and berms, the potential for past releases to surface waters was low. There is no ongoing potential for surface water releases as no hazardous wastes are disposed in the ponds.

Air Release Potential: The ponds were designed for air releases by evaporation. As non-hazardous wastes are disposed in this unit, there is no potential for ongoing releases to air.

Subsurface Gas Release Potential: Based on the inorganic nature of wastes disposed in the ponds, there is no potential, past or ongoing, for the generation of subsurface gas.

Table 1

ANALYTICAL RESULTS OF EVAPORATION POND WASTEWATER AND SLUDGES

Wastewater	LIMIT 560	Total Chromium (mg/L)	LIMIT 5 mg/L	Hexavalent Chromium (mg/L)	Date Sampled
Pond 3		0.59		0.24	10/84
Pond 3		1.6		0.75	08/85
Pond 4		0.49		<0.1	08/85

Sludges	LIMIT 2500	Total Chromium (mg/kg)	LIMIT 500	Hexavalent Chromium (mg/kg)	Date Sampled
Pond 1		1300		<2	10/84
Pond 1		270		<1.0	08/85
Pond 1		1000		<1.0	08/85
Pond 1		900		<1.0	08/85
Pond 2		300		3	10/84
Pond 2		640		<1.0	08/85
Pond 2		580		<1.0	08/85
Pond 2		1200		<1.0	08/85
Pond 3		1620		<1.0	10/84
Pond 3		350		6.2	08/85
Pond 3		430		5.0	08/85
Pond 3		530		<1.0	08/85
Pond 4		1200		<6.0	10/84
Pond 4		18		<1.0	08/85
Pond 4		24		<1.0	08/85
Pond 4		390		<1.0	08/85

Sources: (2,14)

4.12 EAST CHROMIC HYDROXIDE SLUDGE DRYING BED

4.12.1 Information Summary

Unit Description: This unit is one of two inactive chromic hydroxide sludge drying beds located on the west end of the facility property (Figure 3).(2) From 1953 to 1970, this unit was used to dehydrate a lime sludge generated by a water softening process which was discontinued in 1970.(20) From 1970 through October, 1985, this drying bed was used for the treatment of chromic hydroxide sludges removed from the precipitator tank prior to offsite disposal.(2,19)

This sludge drying bed is constructed of eight-inch thick concrete, with dimensions of 20 feet wide and 48.67 feet long.(2) The unit slopes longitudinally, with the upper end at grade level and the lower end approximately two feet below grade.(19) The bed is also divided longitudinally into two sections.(2) The total surface area of the both drying beds is approximately 2,009 square feet.(2) The combined total capacity of the beds was 20,000 gallons.(2)

The disposition of the dehydrated lime sludge is unknown. After drying, the chromic hydroxide sludges were transferred to an EPA-approved Class I disposal site.(2)

Date of Startup: This sludge drying bed was constructed in 1953.(20)

Date of Closure: This unit became inactive in October, 1985.(2,7) At that time, the remaining sludges were removed from the unit and transported to an off-site disposal facility.(19)

Wastes Managed: The precipitator tank sludges discharged into the drying beds were found to contain 37,500 mg/kg total chromium and 4 mg/kg hexavalent chromium.(2) No chemical analyses of the lime sludges were available for this review.

Release Controls: The discharge of chromic hydroxide sludge to the drying bed was manually controlled.(6) The inlet lines to the drying bed had valves to permit isolation.(6) In addition, there were no discharge lines from the drying bed.(6) This unit is concrete-lined.(2)

History of Releases: There was no file record of releases from this unit. In addition, no evidence of releases were observed during the VSI.

4.12.2 Conclusions

Soil/Groundwater Release Potential: The potential for past releases to soil and groundwater is minimal due to the unit's construction and operating conditions. There is no ongoing potential for release to soil or groundwater, as this unit is inactive.

Surface Water Release Potential: There was a potential for release to surface water from this unit during rainfall events, as the upper end of the unit was at grade level and not bermed. There is no potential for ongoing releases to surface water as the unit is inactive.

Air Release Potential: There was a potential for past air releases from this unit, as the bed was open to allow for the dehydration of the sludge. There is no potential for ongoing releases to air as the unit is inactive.

Subsurface Gas Release Potential: Based on the inorganic nature of the wastes disposed in the bed, there was no potential for the generation of subsurface gas from this unit. The unit is inactive, therefore, there is no potential for the ongoing generation of subsurface gas.

4.13 WEST CHROMIC HYDROXIDE SLUDGE DRYING BED

4.13.1 Information Summary

Unit Description: This unit is one of two inactive chromic hydroxide sludge drying beds located on the west end of the facility property (Figure 3).(2) From 1970 through October, 1985, this drying bed was used for the treatment of chromic hydroxide sludges removed from the precipitator tank prior to offsite disposal.(2,19)

This bed is constructed of eight-inch thick concrete, with dimensions of 22.83 feet wide by 48.67 feet long.(2) The unit slopes longitudinally, with the upper end at grade level and the lower end approximately two feet below grade. (19) The total surface area of the drying beds is approximately 2,009 square feet.(2) The combined total capacity of the beds was 20,000 gallons.(2)

After drying, the sludges were transferred to an EPA-approved Class I disposal site.(2)

Date of Startup: This sludge drying beds was constructed in 1970.(2)

Date of Closure: This unit became inactive in 1985.(2,7) At that time, the remaining sludges were removed from the unit and transported to an off-site disposal facility.(19)

Wastes Managed: The precipitator tank sludges discharged into the drying beds were found to contain 37,500 mg/kg total chromium and 4 mg/kg hexavalent chromium.(2)

Release Controls: The discharge of sludge to the drying bed was manually controlled.(6) The inlet lines to the drying bed had valves to permit isolation.(6) In addition, there were no discharge lines from the drying bed.(6) The drying bed is lined with concrete.(2)

History of Releases: There was no file record of releases from this unit. No indications of releases were observed during the VSI.

4.13.2 Conclusions

Soil/Groundwater Release Potential: The potential for past releases to soil and groundwater is minimized by the unit's construction and operating conditions. There is no ongoing potential for release to soil or groundwater, as this unit is inactive.

Surface Water Release Potential: There was a potential for release to surface water from this unit during rainfall events, as the upper end of the unit was at grade level and not bermed. There is no potential for ongoing releases to surface water as the unit is inactive.

Air Release Potential: There was a potential for past air releases from this unit, as the bed was open to allow for the dehydration of the sludge. There is no potential for ongoing releases to air as the unit is inactive.

Subsurface Gas Release Potential: Based on the inorganic nature of the wastes disposed in the bed, there was no potential for the generation of subsurface gas from this unit. The unit is inactive, therefore, there is no potential for the ongoing generation of subsurface gas.

5.0 CONCLUSIONS

A RCRA facility assessment (RFA) was performed to identify and evaluate solid waste management units (SWMUs) at the PG&E Topock Compressor Station, near Needles, California. The RFA utilizes a records review, data evaluation, interviews, and a visual site inspection to evaluate the potential for releases of hazardous constituents to the environment from SWMUs identified during this assessment. The visual site inspection was performed on June 17, 1987.

A total of 16 SWMUs were identified and evaluated at the Topock Compressor Station in the course of this assessment. These SWMUs are shown on Figures 2 and 3 and listed below:

Unit 4.1	Percolation Pond
Unit 4.2	Injection Well
Unit 4.3	Oil/Water Holding Tank
Unit 4.4	Oil/Water Separator
Unit 4.5	Portable Waste Oil Storage Tank (Identified during the VSI)
Unit 4.6	Waste Oil Storage Tank (Identified during the VSI)
Unit 4.7	Chromate Reduction Tank - RCRA Regulated
Unit 4.8	Transfer Sump - RCRA Regulated
Unit 4.9	Precipitator Tank - RCRA Regulated
Unit 4.10	Process Pump Tank - RCRA Regulated
Unit 4.11	Four Evaporation Ponds - RCRA Regulated
Unit 4.12	East Chromic Hydroxide Sludge Drying Bed - RCRA Regulated
Unit 4.13	West Chromic Hydroxide Sludge Drying Bed - RCRA Regulated

<u>Inactive Percolation Bed (Unit 4.1)</u>

The unit of primary concern at this facility is the inactive percolation bed (Unit 4.1) This unit was used for a 19 year period for the disposal of untreated cooling tower blowdown containing chromium. Approximately six million gallons of this wastewater, with an estimated total chromium concentration of 10 ppm, were disposed in this unit each year during that period.

Although the unit was designed for soil releases, there was also a high potential for air releases and surface water releases during rainfall events. The potential for groundwater releases from this unit is unknown, as site-specific hydrogeology with regard to soil permeability and depth to groundwater is unavailable.

This percolation bed is part of a DOHS investigation under the State of California Superfund Program. The facility has submitted a sediment sampling and analysis plan for the percolation bed and Bat Cave Wash to DOHS, and is currently awaiting DOHS approval of the plan before commencing with any sampling.

Inactive Injection Well (Unit 4.2)

The inactive injection well, which operated for a four year period, received treated cooling tower blowdown. The well was designed for discharge into a lower, unusable aquifer. It is unknown if the upper and lower aquifers are hydraulically connected, as well log data for this particular well were not available. Hence, the groundwater release potential to the upper aquifer cannot be evaluated at this time. There was no other potential for releases to surface waters, air, or for the generation of subsurface gas from this unit. The injection well is also a part of the DOHS investigation under the State Superfund Program, although no sampling and analyses plans have been submitted by the facility for this particular unit.

Oil/Water Treatment and Storage (Units 4.3 - 4.8)

The oil/water treatment and storage system consists of the oil/water holding tank (Unit 4.3), oil/water separator (Unit 4.4), portable waste oil storage tank (Unit 4.5), waste oil storage tank (Unit 4.6), chromate reduction tank (Unit 4.7), and the transfer sump (Unit 4.8). Chemical analyses of the oily wastewaters and separated oils stored/treated in these units to determine the hazardous characteristics or constituents of these wastes were unavailable for this review. However, it is expected that these wastewaters and separated oils contain 40 CFR 261, Appendix VIII constituents, typical of complex hydrocarbons.

Of the units in this oil/water treatment system, only the oil/water separator has a high potential for releases to soil, air, and surface waters due to inadequate containment. Releases of oily wastes to the soil have occurred from this unit as evidenced in the VSI. Groundwater releases from this unit cannot be adequately evaluated, as site-specific hydrogeologic information for this area is unavailable. The oil/water separator was constructed in 1951, although the disposition of the effluent from this time to the construction of the evaporation ponds is unknown.

The other unit in this oil/water treatment system with significant release potential is the chromate reduction tank, now used as a temporary oil holding tank. There is a soil and air release potential from this unit due to inadequate containment. Groundwater releases from this unit cannot be adequately evaluated, as site-specific hydrogeologic information for this area is unavailable.

The other units in the oil/water treatment system have a low potential for releases to soil, air, and surface water based on the units' construction, containment, and operating conditions.

Cooling Water Treatment System (Units 4.7 - 4.10)

The cooling water treatment system consisted of the chromate reduction tank (Unit 4.7), transfer sump (Unit 4.8), precipitator tank (Unit 4.9), and process pump tank (Unit 4.10) All three of the above tanks had a high potential for release to air, as the tanks were open-topped. The chromate reduction tank had inadequate containment to control soil releases. The sump, precipitator tank, and process pump had adequate overflow controls to reduce the potential for releases to soil, groundwater, and surface water. None of these units have ongoing release potentials related to this system.

Evaporation Ponds (Unit 4.11)

The evaporation ponds were designed for air release of the wastes. The ponds were equipped with liners, berms, and a leak detection system to minimize the potential for releases to soil, groundwater, and surface water. Groundwater monitoring around the ponds is ongoing as part of the unit's closure activities.

Sludge Drying Beds (Units 4.12 and 4,13)

Both sludge drying beds had a potential for releases to air and surface water based on the construction of these units. The units' operating conditions and construction reduced the potential for releases to soil and groundwater.

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20. Bennett, M., PG&E. 7/2/87. Letter to J. Kiernan, SAIC. Re: VSI Follow-up Information.

21. Humphrey, C., DOHS. 7/24/87. Personal communication with J. Kiernan, SAIC.

SUMMARY TRIP REPORT

A visual site inspection (VSI) was performed at the Pacific Gas and Electric Company's Topock Compressor Station near Needles, California, on June 17, 1987. The day was sunny and dry with temperatures in the upper 90's. Winds were calm. Mark Allen, P.E., and Jill Kiernan of the A.T. Kearney Team, inspected the facility and conducted personal interviews with Donald Yorke, P.E., Gas Engineer, Marvin Bennett, Manager of the Pipe Line Operations Department, and Cathy Rincon. Charles Humphrey, Jr., Waste Management Engineer, representing the California Department of Health Services, and Mohammed Ali Khan, Staff Engineer, representing the California Regional Water Quality Control Board, Colorado River Basin Region, also participated in the visual site inspection.

The inspection commenced at 9:00 a.m. in the conference room at the compressor station. Agency staff explained the purpose of the VSI to the facility representatives. The A.T. Kearney Team then interviewed the facility representatives regarding the history, operational procedures, and waste management practices of the Topock Compressor Station. Following the discussion, a site tour of the entire facility was conducted. All SWMUs identified in the preliminary review were inspected. The compressor bulidlng, cooling towers, and product storage areas were also inspected. Two additional SWMUs were identified as a result of the VSI. These are the two waste oil storage tanks (Units 4.5 and 4.6).

The site tour, which was completed in approximately two hours, was followed by a debriefing meeting. The A.T. Kearney Team asked questions of the facility representatives to confirm or clarify information obtained during the site tour. Agency staff then explained the next stage of the assessment to the facility representatives.