Subappendix B19
AOC 22 – Unidentified Three-sided Structure Investigation Program

Contents

Acronyms and Abbreviations

AOC	Area of Concern
bgs	below ground surface
COPC	chemical of potential concern
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
SVOC	semivolatile organic compound
TPH	total petroleum hydrocarbons
VOC	volatile organic compound

SUBAPPENDIX B19

AOC 22 Investigation Program

1.0 Introduction and Background

1.1 Background

Area of Concern (AOC) 22, which is visible in the May 19, 1955 aerial photographs (CH2M HILL, 2007), as well as a photograph believed to have been taken between 1954 and 1958, consists of a three-sided structure located in the upper yard, along with what is now the compressor station fence line. AOC 22 was incorporated into this work plan at the request of California Environmental Protection Agency, Department of Toxic Substances Control (2010). The northern end of the structure was slightly north of what is now the Technical Maintenance Shop (the Technical Maintenance Shop did not exist in the aerials that show the three-sided structure). Based on the aerial photo, it appears that the footprint of the structure would have been located within the current unpaved area adjacent to the fence line.

In the aerial photo, a container that appears to be a drum is located near this structure. There is no available information on the use of this structure or any materials that may have been stored at this structure or in its vicinity. The area around the structure is unpaved.

1.2 Conceptual Site Model

A graphical conceptual site model has been developed for AOC 22 based on the above site history and background, as shown in Figure B19-1. (All tables and figures appear at the end of this subappendix.) Table B19-1 presents primary sources, primary source media, potential release mechanisms, secondary source media, and potential secondary release mechanisms for AOC 22. A detailed discussion of the migration pathways, exposure media, exposure routes, and receptors is included in the *Soil Part B Data Quality Objectives Technical Memorandum, PG&E Topock Compressor Station Needles, California* (CH2M HILL, 2011).

The primary sources of contamination at AOC 22 are likely to be incidental spills of any materials stored in this area. The potential type and quantity any materials released in the vicinity this structure are unknown. The primary source medium at AOC 22 is surface soil. Because the area around AOC 22 is unpaved, liquids released in AOC 22 would have been released to surface soil and could have infiltrated shallow soil. Liquids released to shallow soils could have infiltrated to deeper soils. If present, organic constituents in surface soils could have been degraded by heat and light. In addition, contaminated surface soil runoff would have been a potential migration pathway to the east to the area outside the fence line.

2.0 Summary of Past Soil Characterization

There is no information regarding the purpose of this structure, and there are no current data in the immediate vicinity of the structure; however, several samples associate with AOC 9 (Southeast Fence Line) are located downslope from this structure. Sample locations

AOC9-5 and AOC9-10 are immediately downslope from where the three-sided structure was located. Sample locations AOC9-6, AOC9-11, AOC9-13, and AOC9-14 are located further downslope (downslope from locations AOC9-5 and AOC9-10).

The six soil samples collected immediately downslope of this structure indicate that total chromium, hexavalent chromium, copper, lead, mercury, zinc, and benzo(a)pyrene exceeded the Part A screening values for areas outside the fence line one or more times in these samples. Detectable concentrations of mercury were found in four of the six samples.

3.0 AOC 22 Nature and Extent Data Gaps Evaluation

This AOC has not been previously sampled.

4.0 AOC 22 Data Gaps and Proposed Sampling

4.1 AOC 22 Data Gaps

Based on the site conceptual model and Part B data quality objectives, the following data gap was identified for Decision 1, as follows:

- Data Gap #1 – Lateral and vertical extents of contamination underneath and immediately adjacent to former three-sided structure

Data gaps for Decisions 2 through 5 are discussed in Appendix B and include the following:

- **Decision 2:** In general, with the exception of polycyclic aromatic hydrocarbons (PAHs) in shallow soil, existing data are adequate to support exposure point concentration development for detected chemicals that exceeded one or more comparison values. However, since semivolatile organic compound (SVOC) analysis, which includes PAHs, has been added to most soil samples collected within the fence line, this data gap has been addressed.
- **Decision 3:** Nature and extent (Decision 1) must be defined to fully assess Decision 3. Insufficient information is available to calculate soil screening levels protective of groundwater and to support screening-level groundwater modeling results, where necessary.
- **Decision 4:** Insufficient information is available to characterize the potential migration pathways from areas within the fence line to areas outside the fence line. An evaluation of the storm drain system and sheet flow runoff pathways is required. In addition, data are required to characterize surface soils in unpaved areas, to define locations with chemicals of potential concern (COPCs) and chemicals of potential ecological concern above Part A interim screening levels that could become potential sources of COPCs and chemicals of potential ecological concern to areas outside the fence line.
- **Decision 5:** Various types of data will be needed to support the evaluation of technologies/remedial actions for the corrective measures study/feasibility study and potential interim measures, including soil physical parameters, constituent leachability

data and, if remediation is required, waste characterization information and more detailed information on subsurface obstructions.

The proposed sample design is discussed In Section 4.3 of this subappendix.

4.2 AOC 22 Access Constraints

As discussed in Section 3.0 and Figure B-3 in Appendix B, there are substantial access constraints within the compressor station. AOC 22 is located in Area 16 on Figure B-2, Topock Accessibility Map, in the main text of Appendix B. AOC 22 is located in an unpaved section of the compressor station, and both sampling locations are likely accessible by hydrovac. Table B19-2 provides the accessibility assessment for the proposed AOC 22 samples. Thirty-six utility risers, consisting of various water and electrical lines, are present in this area. Photograph 44 in Appendix B26 shows the accessibility constraints in AOC 22. Sample locations and depths identified for AOC 22 reflect the identified access constraints and the phased sampling approach described in Section 4.0 of Appendix B.

4.3 AOC 22 Proposed Sampling

Table B19-2 summarizes the proposed AOC 22 sample locations, depths, description/ rationale for each location (that is, the data gaps they would address), and analytes. Proposed sample locations are also shown in Figure B19-2. The figure also shows proposed sample locations for surrounding Solid Waste Management Units and AOCs. The proposed AOC 22 sample locations were defined in collaboration with California Environmental Protection Agency, Department of Toxic Substances Control and the United States Department of the Interior and will be optimized and sampled in accordance with the phased sampling approach outlined in Section 4.0 of Appendix B.

Samples are proposed to be collected at two locations: AOC 22-1 and AOC 22-2. COPCs are anticipated to be limited to soil only (CH2M HILL, 2007). Proposed samples for nearby AOCs will also be used to characterize soil for this unit, as shown on Figure B19-2. Samples from this area will be analyzed for Title 22 metals, hexavalent chromium, pH, volatile organic compounds (VOCs), total petroleum hydrocarbons (TPH), SVOCs, polychlorinated biphenyls (PCBs), and PAHs. Ten percent of all samples collected during the investigation will also be analyzed for the full suite of Target Analyte List/Target Compound List constituents.

To address the data needs associated with Decision 5, one sample will also be analyzed for soil characteristics, including grain size, washes (P200 sieve), Atterberg limits, and gradation. The sample has been tentatively identified in Table B19-2; the specific sample to be analyzed for these parameters will be confirmed in the field. Data will be reviewed and evaluated as described in the main text of Appendix B. In addition, to address potential concerns associated with leaching of COPCs to groundwater, select samples may be analyzed for soluble total chromium and hexavalent chromium using the US EPA Method SW1312 synthetic precipitation leaching procedure. Samples will be analyzed by synthetic precipitation leaching procedure only after initial sample results have been received, evaluated, and compared against the soil screening levels developed for Decision 3.

5.0 References

ARCADIS. 2009. *Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil.* July 1.

California Department of Toxic Substances Control. 2010. “Response to Comments to the Soil Part B Work Plan.” July 20.

CH2M HILL. 2007. *Revised Final RCRA Investigation/Remedial Investigation Report, Volume 1 - Site Background and History, PG&E Topock Compressor Station, Needles, California.* August 10.

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Tables

TABLE B19-1
Conceptual Site Model, AOC 22 – Unidentified Three-sided Structure
Soil Investigation Part B Work Plan,
PG&E Topock Compressor Station, Needles, California

Primary Source	Primary Source Media	Potential Release Mechanism	Secondary Source Media	Potential Secondary Release Mechanism
Incidental spills and releases from possible hazardous material storage in structure	Surface Soil	Percolation and/or infiltration	Surface Soil	Wind erosion and atmospheric dispersion of surface soil
			Shallow Soil	Potential volatilization and atmospheric dispersion
				Potential extracted groundwater[a]

Notes:

[a] Quantitative evaluation of the groundwater pathway was completed in the groundwater risk assessment (ARCADIS, 2009); Part B data will be reviewed in the data gaps assessment to evaluate potential fate impacts or current localized impacts to groundwater from soil.

TABLE B19-2
Proposed Sampling Plan, AOC 22 – Unidentified Three-sided Structure
Soil Investigation Part B Work Plan
PG&E Topock Compressor Station, Needles, California

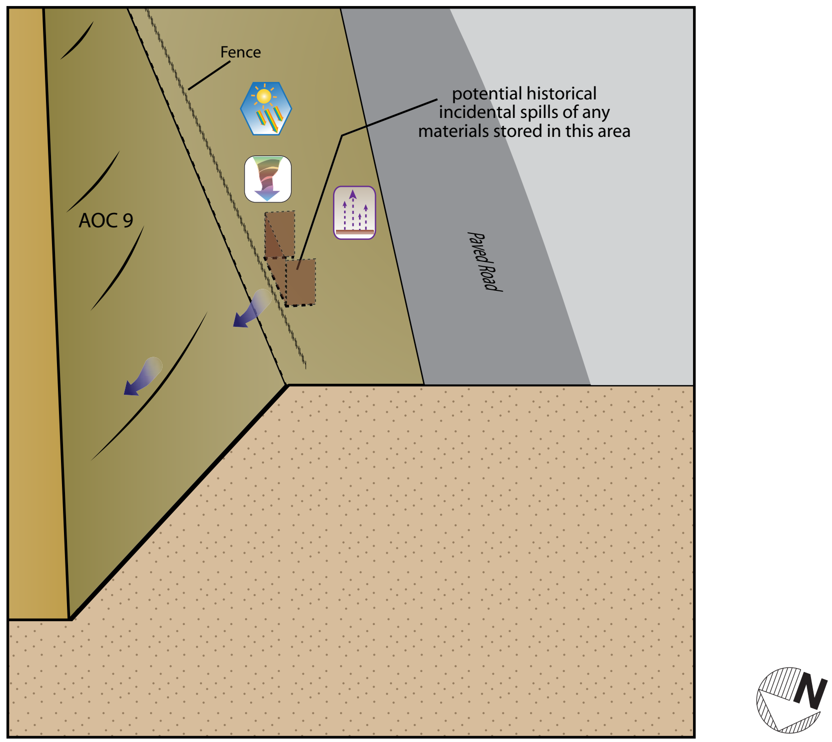
Location	Depths (feet bgs)	Description/Rationale	Analytes	Accessibility Assessment
AOC 22-1	0-0.5 and 3, if feasible	To resolve Data Gap #1, lateral and vertical extents of contamination underneath and immediately adjacent to former three-sided structure	Title 22 metals, hexavalent chromium, pH, VOCs, TPH, SVOCs, PCBs, and PAHs; also will be analyzed for soil characteristics, including grain size, washes (P200 sieve), Atterberg limits, and gradation	Suitable for x-ray fluorescence Likely accessible for hydrovac
AOC 22-2	0-0.5 and 3, if feasible	To resolve Data Gap #1, lateral and vertical extents of contamination underneath and immediately adjacent to former three-sided structure	Title 22 metals, hexavalent chromium, pH, VOCs, TPH, SVOCs, PCBs, and PAHs	Suitable for x-ray fluorescence Likely accessible for hydrovac

Notes:

Ten percent of samples from the investigation will be analyzed for Target Analyte List/Target Compound List constituents.

VOC analysis will not be conducted on surface soil samples (0 to 0.5 foot below ground surface [bgs]).

Figures



NOT TO SCALE

LEGEND

Potential Release Mechanisms

Infiltration

Infrequent Surface Water Runoff

Volatilization

Degradation by Heat/Light

FIGURE B19-1
Conceptual Site Model for AOC22
Unidentified Three-Sided Structure
Soil Investigation Part B Work Plan
PG&E Topock Compressor Station
Needles, California

CH2MHILL.

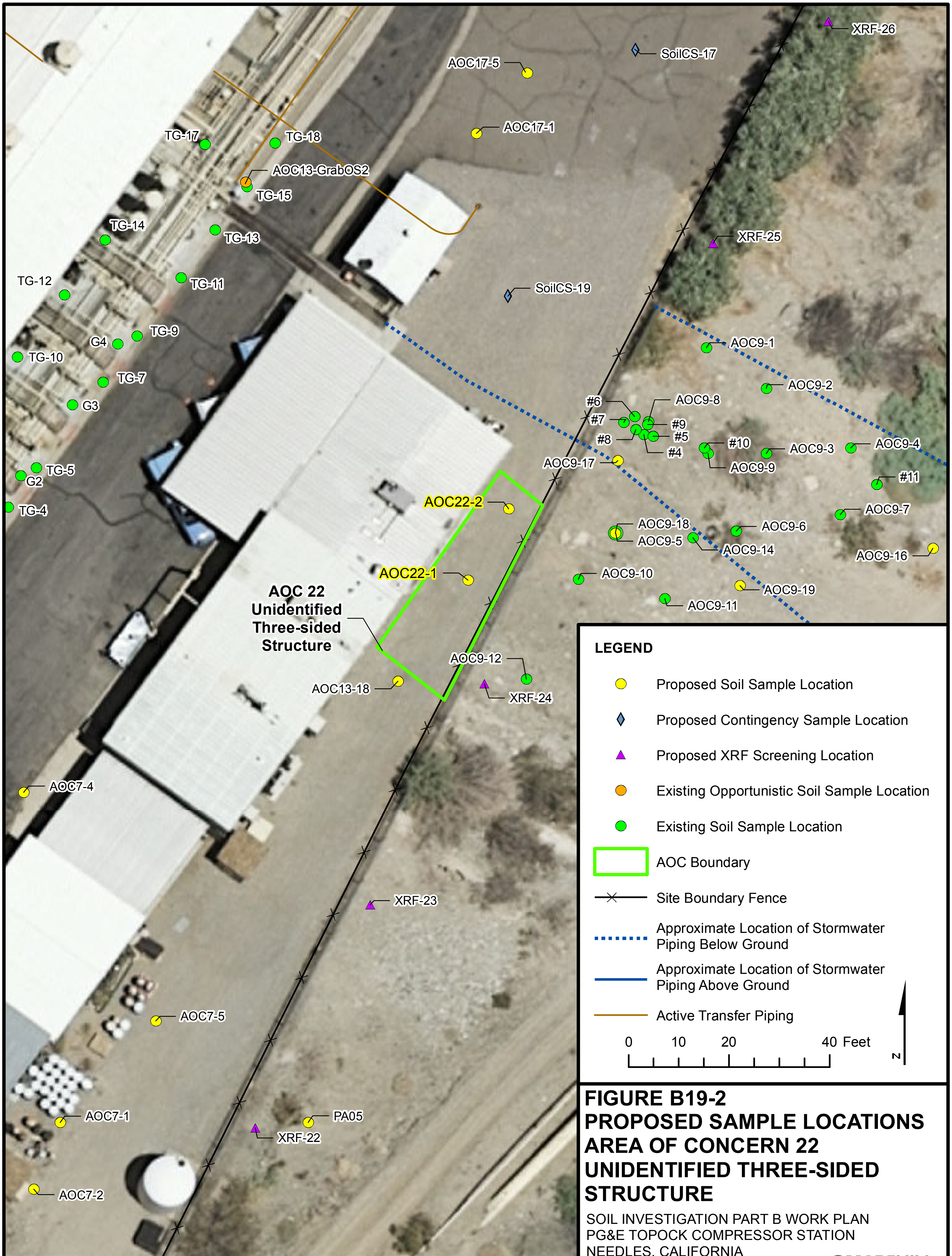


FIGURE B19-2
PROPOSED SAMPLE LOCATIONS
AREA OF CONCERN 22
UNIDENTIFIED THREE-SIDED STRUCTURE

SOIL INVESTIGATION PART B WORK PLAN
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

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Subappendix B20
AOC 23 – Former Water Conditioning Building Investigation Program

Contents

Acronyms and Abbreviations

AOC	Area of Concern
bgs	below ground surface
COPC	chemical of potential concern
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PG&E	Pacific Gas and Electric Company
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
TPH	total petroleum hydrocarbons
VOC	volatile organic compound
XRF	x-ray fluorescence

SUBAPPENDIX B20

AOC 23 Investigation Program

1.0 Introduction and Background

1.1 Background

Area of Concern (AOC) 23 is the former Water conditioning Building which is located in the southern portion of the upper yard. AOC 23 was incorporated into this work plan at the request of California Environmental Protection Agency, Department of Toxic Substances Control (DTSC, 2010). Two solid waste management units (SWMUs)—SWMU 7 Precipitation Tank (closed), and SWMU 8 Process Pump Tank—are located immediately south of this building (the area occupied by the two former tanks is now covered by the Fire Pump Building). The tanks associated with these two units were removed in 1990 as part of the closure of the former hazardous waste treatment system. The Former Water Conditioning Building has also previously been identified as the “Water Softening Building” and is currently identified as the “Storage Building.” Water softening (mineral removal from raw well water) was conducted at the station to reduce the amount of cooling tower blowdown generated during plant operations. The need for water softening was eliminated when the source of plant water was switched to new water supply wells on the Arizona side of the river in the early 1960s.

AOC 23 is currently used for storage of miscellaneous dry materials; no hazardous materials are stored here. Available information indicates that the Former Water-c Conditioning Building may have been used for dry storage of the chemicals (primarily soda ash and lime) used in the Permutit water-softening process. The water- softening process occurred in the large Permutit precipitator outside the building (Permutit, 1948). The Permutit process was used at the compressor station until approximately 1962. The building was divided into eastern and western sides. The western side contained the mixing tanks used to dissolve the soda ash and lime, as well as pumps to feed the lime and soda ash slurries to the precipitation tank outside the building. The pre-mixed chemicals were pumped to the precipitation tank through dedicated lines leading directly from inside the building to the precipitation tank. The eastern side of the building contained the pumps used to circulate the treated (softened) water and fire water (Pacific Gas and Electric Company [PG&E], PGE 1960).

Raw (incoming) well water was pumped into the Permutit precipitator and mixed with soda and lime slurry to remove excess minerals and thereby soften the water. Sodium aluminate was another chemical used in the process. The primary chemical used was soda ash; plant records from 1958 indicate that soda ash was delivered in bulk shipments of approximately 50,000 pounds every 4 to 6 weeks. Lime was provided in 50-pound bags, and the process apparently consumed several hundred pounds per day (PG&E, PGE 1959). Treated (softened) water was pumped into a holding tank, and water treatment was discontinued when the treated water tank was full. Precipitated water- softening sludge was transferred directly to Sludge Drying Bed 1 via a dedicated pipeline.[1] In approximately 1957, a bulk chemical storage and feed system was constructed to handle the soda ash (PG&E, PGE 1957, PGE 1970a1970c). This system consisted of a conveyor trench, an elevator, and storage bins on top of the building. The components of this system are visible in the 1967 aerial photograph, and may have been removed when the two-step hazardous waste treatment system was constructed. At that time, one of the mixing tanks was reused as the chromate reduction tank (SWMU 6), and the other tank was reused as part of the Precipitation Tank (SWMU 7) (PG&E, 1970b-cPGE 1970a, PGE 1970b).

The foundation of the building was built up around the mixing tanks (also referred to as "chemical vats" in some of the old drawings) to provide easy access during operations. Sometime after the tanks were removed, the concrete foundation was brought to a common level, and a small former stairwell was also filled in. The doorway leading to the stairwell was sealed off, thereby dividing the building in half. Floor drains were present on both sides of the building and were initially connected to the industrial drains. The drain in the western half of the building (containing the chemical mixing tanks) was later cut off and rerouted to the sludge drain pipeline (PG&E,PGE undated).

From 1969 to 1985, the former Permutit Precipitation Tank (SWMU 7) was used as the precipitation tank for the hazardous waste treatment system . Therefore, it is also possible that this building may have been used to store chemicals or house incidental equipment associated with the hazardous waste treatment system. The chemicals used in the hazardous waste treatment system at this location consisted of sodium hydroxide, Poly Floc II, and ferric sulfate in the precipitation tank. No chemicals were known to have been added to the process pump tank.

Concrete of different ages and colors was present in the building at the time of the most recent site visit; however, the stained concrete noted by the DTSC was only apparent on the steps outside the building.

1.2 Conceptual Site Model

A graphical conceptual site model has been developed for AOC 23 based on the above site history and background, as shown in Figure B20-1. (All tables and figure appear at the end of this subappendix.) Table B20-1 presents primary sources, primary source media, potential release mechanisms, secondary source media, and potential secondary release mechanisms for AOC 23. A detailed discussion of the migration pathways, exposure media, exposure routes, and receptors is included in the *Soil Part B Data Quality Objectives Technical Memorandum, PG&E Topock Compressor Station Needles, California* (CH2M HILL, 2011).

The primary sources of contamination at AOC 23 are likely to be historical incidental spills of dry soda ash or lime, and/or water-softening sludge. If sodium hydroxide, Poly Floc II, and ferric sulfate were stored in the building, incidental spills of these chemicals could also have occurred at AOC 23. The quantities of any materials released are unknown; however, the quantities are expected to be relatively small because, spills of dry material would most likely have been contained in the building or cleaned up if needed, and spills of water-softening sludge would similarly have been cleaned up. Sodium hydroxide spills would

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[1] This pipeline was later reused for the hazardous waste treatment system.

have been cleaned up quickly due to the acute danger posed by the chemical. Any releases of sodium hydroxide to soil would have raised the pH of the soil and thereby reduced the solubility of metals in the soil. If a large release of water-softening sludge occurred, it could have resulted in water potentially containing some sludge reaching the storm drain system and being discharged outside the fence line. Because the area around the AOC was unpaved, dry chemicals deposited on the soil could also have been entrained in stormwater runoff and been discharged outside the fence line. Releases via the storm drain system are addressed by the storm drain investigation program described in Appendix D of this work plan. Finally, while there is no information indicating that the concrete floor in the building lacked integrity in the past, it is possible that small cracks are present and that small quantities of dissolved lime or soda ash may have been released to shallow soil directly beneath the building.

The primary source medium at AOC 23 is concrete within the building (the building floor). Secondary source media include surface soil adjacent to the building, and shallow soil underneath the building. If any liquids were released in AOC 23, they would have been released to surface soil and could have infiltrated shallow soil or been released to shallow soil directly. Liquids released to shallow soils could have infiltrated to deeper soils. Due to the high pH of the main chemicals used in the water- softening process, release of the chemicals or sludge would have helped to fix any metals contained in the material, and prevent migration. No organic compounds were used in the water-softening process.

2.0 Summary of Past Soil Characterization

There are no current data in the immediate vicinity of AOC 23; however, inorganic compound data from the adjacent SWMUs 7 and 8 were collected during the closure of the SWMUs. Both tanks were open- top tanks located on concrete pads. Confirmation samples were collected following removal of the tanks, concrete foundations, sub-soils, and approximately 1 foot of contaminated soils. A sample trench was excavated, and confirmation samples were collected from two locations in the wall of the trench for SWMU 7 and one location for SWMU 8. At location PT-3, samples were collected at approximately 4 and 6 feet below ground surface (bgs). At location PT-4, a sample was collected at 3.5 feet bgs. At location PPT-4, samples were collected at 4 and 5 feet bgs.[2] The samples were analyzed for Title 22 metals, hexavalent chromium, fluoride, and pH.

The results of the final confirmation samples (PT-3_2, PT-3_4, and PT-4_1.5, PPT4_2, and PPT 4_3) indicated that all chemicals of potential concern (COPCs) were at levels below cleanup objectives (that is., established background concentrations at the time). Five constituents were detected above their respective background threshold values in these five samples, and mercury was detected at a concentration of 0.015 milligrams per kilogram. A background concentration for mercury has not been established; however, the detected concentration is below the commercial screening level. Cobalt, copper, lead, nickel, and zinc samples each exceeded their respective background threshold values once. None of these concentrations exceeded respective commercial screening levels. The overall concentration

[2] The sample depths stated are estimates assuming that the footings and associated excavation reached a depth of approximately two feet bgs. The Mittelhauser report documenting closure of SWMUs 7 and 8 referenced the depth of the samples to the bottom of the excavation (Mittlehauser 1990).

and distribution of constituents in the five samples indicate that there has been no adverse impact to soil beneath the former tanks. Additional data will be collected at SWMU 8 in accordance with requirements defined by DTSC (2006).

AOC 23 has not been previously sampled.

3.0 AOC 23 Data Gaps and Proposed Sampling

3.1 AOC 23 Data Gaps

Based on the site conceptual model and Part B data quality objectives, the following data gap was identified for Decision 1:

1. Data Gap #1 – Lateral and vertical extents of contamination underneath and immediately adjacent to the Water-c Conditioning Building.

Data gaps for Decisions 2 through 5 are discussed in Appendix B and include:

- **Decision 2:** In general, with the exception of polycyclic aromatic hydrocarbons (PAHs) in shallow soil, existing data are adequate to support exposure point concentration development for detected chemicals that exceeded one or more comparison values. However, since semivolatile organic compound (SVOC) analysis, which includes PAHs, has been added to most soil samples collected within the fence line, this data gap has been addressed.
- **Decision 3:** Nature and extent (Decision 1) must be defined to fully assess Decision 3. Insufficient information is available to calculate soil screening levels protective of groundwater and to support screening-level groundwater modeling results, where necessary.
- **Decision 4:** Insufficient information is available to characterize the potential migration pathways from areas within the fence line to areas outside the fence line. An evaluation of the storm drain system and sheet flow runoff pathways is required. In addition, data are required to characterize surface soils in unpaved areas, to define locations with COPCs and chemicals of potential ecological concern above Part A interim screening levels that could become potential sources of COPCs and chemicals of potential ecological concern to areas outside the fence line.
- **Decision 5:** Various types of data will be needed to support the evaluation of technologies/remedial actions for the corrective measures study/feasibility study and potential interim measures, including soil physical parameters, constituent leachability data and, if remediation is required, waste characterization information and more detailed information on subsurface obstructions.

The proposed sample design is discussed in Section 3.3 of this subappendix.

3.2 AOC 23 Access Constraints

As discussed in Section 3.0 and Figure B-3 in Appendix B, there are substantial access constraints within the compressor station. AOC 23 is located in Area 15 on Figure B-2, the

Topock Compressor Accessibility Map, in the main text of Appendix B (Figure B-2). The building has a two-level foundation: the western portion of the building has a foundation that is approximately 2 to 3 feet thick, and the eastern portion is approximately 1 foot thick. Due to the active use of the building and difficult access into the building, no sampling is proposed within the building. Proposed sampling location AOC23---1 is located within a paved area and is not suitable for x-ray fluorescence (XRF) screening; however, it is likely accessible by hydrovac. The remaining two sampling locations, AOC23-2 and AOC23--3, are suitable for XRF screening and likely accessible by hydrovac, respectively. Accessibility assessments for the three proposed sampling locations can be found in Table B20-2. Thirty--five utility risers, including gas, electrical, SCADA, and water lines, are located in Area 3. In addition two anodes and a vault were identified in Area 15. Photographs 45 through 49 in Subappendix B26 show the accessibility constraints in AOC 23. Sample locations and depths identified for AOC 23 reflect the identified access constraints and the phased sampling approach described in Section 4.0 of this main Appendix B.

3.3 . AOC 23 Proposed Sampling

Table B20-2 summarizes the proposed AOC 23 sample locations, depths, description/rationale for each location (that is, the data gaps they would address), and analytes. Proposed sample locations are also shown in Figure B20-2. The figure also shows proposed sample locations for nearby SWMUs and AOCs. The proposed AOC 23 sample locations were defined in collaboration with DTSC and the United States Department of the Interior and will be optimized and sampled in accordance with the phased sampling approach outlined in Section 4.0 of Appendix B.

Based on the available information, COPCs for this unit consist of metals, potentially including hexavalent chromium. COPCs are anticipated to be limited to soil only (CH2M HILL, 2007). Samples from this area will be analyzed for Title 22 metals, hexavalent chromium, volatile organic compounds (VOCs), total petroleum hydrocarbons (TPH), SVOCs, PAHs, polychlorinated biphenyls (PCBs), and pH. Samples are proposed to be collected at three locations: AOC 23-1 through AOC 23-3. Proposed samples for nearby AOCs will also be used to characterize soil for this unit, as shown on Figure B20-2. The sample locations in this unit will initially be sampled at the surface (0 to 1 foot bgs) and shallow (2 to 3 feet bgs) subsurface intervals, in accordance with the phased sampling protocol. Where the area of sampling is covered with concrete or asphalt, the surface sampling interval will begin at the bottom of the concrete/asphalt or gravel sub-base. In most cases, this first interval will be from 0.5 to 1 foot below the pavement. Ten percent of all samples from the investigation will also be analyzed for the full suite of Target Analyte List//Target Compound List constituents.

To address the data needs associated with Decision 5, one sample will also be analyzed for soil characteristics, including grain size, washes (P200 sieve), Atterberg limits, and gradation. The sample has been tentatively identified (in Table B20-2); the specific sample to be analyzed for these parameters will be confirmed in the field. Data will be reviewed and evaluated as described in the main text of Appendix B. In addition, to address potential concerns associated with leaching of COPCs to groundwater, select samples may be analyzed for soluble total chromium and hexavalent chromium using the US EPA Method SW1312 synthetic precipitation leaching procedure. Samples will be analyzed by synthetic precipitation leaching procedure only after initial sample results have been received, evaluated, and compared against the soil screening levels developed for Decision 3.

4.0 References

ARCADIS. 2009. *Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil.* July 1.

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CH2M HILL. 2007. *Revised Final RCRA Investigation/Remedial Investigation Report, Volume 1 - Site Background and History, PG&E Topock Compressor Station, Needles, California.* August 10.

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__________. 1970b. Engineering Drawing 485349 (no revision number): *Piping Plan for Waste Water Well Disposal System Area No. 5, Topock Compressor Station, Gas Operations*. Original drawing dated February 25.

__________. 1970c1970b. Bill of Materials to Accompany DWG 485349 & 485350 *Piping Plan and Sections, Waste Water Well Disposal System, Area No. 5 - Topock Compressor Station*. February 25.

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Tables

TABLE B20-1
Conceptual Site Model, AOC 23 - Former Water Conditioning Building
Soil Investigation Part B Work Plan,
PG&E Topock Compressor Station, Needles, California

Primary Source	Primary Source Media	Potential Release Mechanism	Secondary Source Media	Potential Secondary Release Mechanism
Potential incidental spills of water conditioning products	Surface Soil	Percolation and/or infiltration	Surface Soil	Wind erosion and atmospheric dispersion of surface soil
			Shallow Soil	Potential volatilization and atmospheric dispersion
				Potential extracted groundwater[a]

Notes:

[a] Quantitative evaluation of the groundwater pathway was completed in the groundwater risk assessment (ARCADIS, 2009); Part B data will be reviewed in the data gaps assessment to evaluate potential fate impacts or current localized impacts to groundwater from soil.

TABLE B20-2
Proposed Sampling Plan, AOC 23 - Former Water Conditioning Building
Soil Investigation Part B Work Plan,
PG&E Topock Compressor Station, Needles, California

Location	Depths (feet bgs)	Description/Rationale	Analytes	Accessibility Assessment
AOC 23-1	0-1[a] and 3, if feasible	To resolve Data Gap #1, I – Lateral and vertical extents of contamination underneath and immediately adjacent to the Water-c Conditioning Building	Title 22 metals, hexavalent chromium, VOCs, TPH, SVOCs, PAHs, PCBs, and pH	Not suitable for XRF. Likely accessible by hydrovac.
AOC 23-2	0-0.5 and 3, if feasible	To resolve Data Gap #1, I – Lateral and vertical extents of contamination underneath and immediately adjacent to the Water-c Conditioning Building	Title 22 metals, hexavalent chromium, VOCs, TPH, SVOCs, PAHs, PCBs, and pH; also will be analyzed for soil characteristics, including grain size, washes (P200 sieve), Atterberg limits, and gradation.	Suitable for XRF. Suitable for hand sampling. Likely accessible by hydrovac.
AOC 23-3	0-0.5 and 3, if feasible	To resolve Data Gap #1 – Lateral and vertical extent of contamination underneath and immediately adjacent to the Water Conditioning Building	Title 22 metals, hexavalent chromium, VOCs, TPH, SVOCs, PAHs, PCBs, and pH	Suitable for XRF. Suitable for hand sampling. Likely accessible by hydrovac.

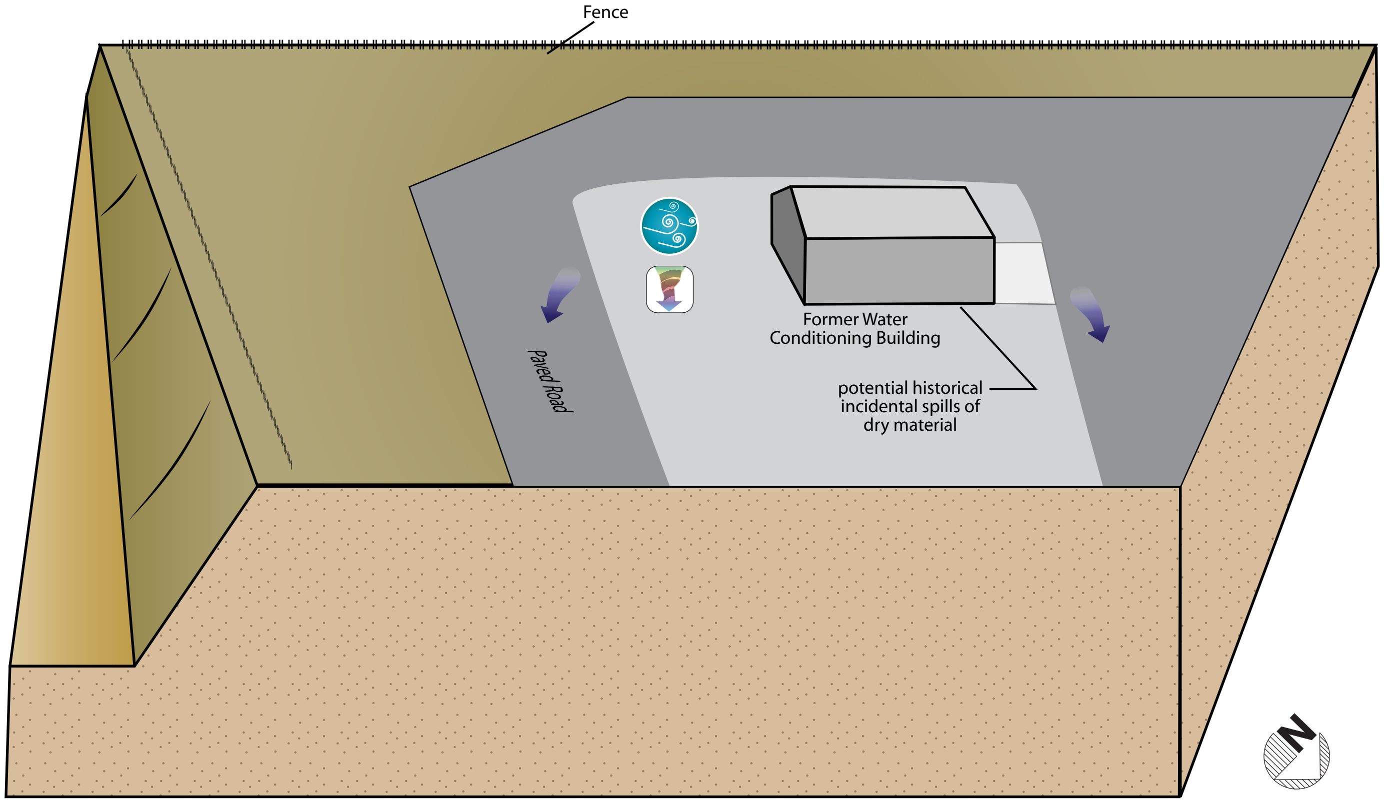
Notes:

[a] Surface soil sample intervals in paved areas are approximate. Surface soil samples will be collected beneath the asphalt/concrete and/or sub-gravel base.

Ten percent of samples from the investigation will be analyzed for Target Analyte List/Target Compound List constituents.

VOC analysis will not be conducted on surface soil samples (0 to 0.5 foot bgs).

Figures



NOT TO SCALE

LEGEND

Potential Release Mechanisms

Infiltration

Windblown Dispersion

Infrequent Surface
Water Runoff

FIGURE B20-1
Conceptual Site Model for AOC23
Former Water Conditioning Building
Soil Investigation Part B Work Plan
PG&E Topock Compressor Station
Needles, California

CH2MHILL.

FIGURE B20-2
AREA OF CONCERN 23
FORMER WATER CONDITIONING BUILDING

SOIL INVESTIGATION PART B WORK PLAN
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\SWP_B\AOC23\AOC23_Proposed_Sample_Locs.mxd

Subappendix B21
AOC 24 – Stained Area and Former API Oil/Water Separator Investigation Program

Contents

Acronyms and Abbreviations

AOC	Area of Concern
API	American Petroleum Institute
bgs	below ground surface
COPC	chemical of potential concern
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
OWS	oil/water separator
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PG&E	Pacific Gas and Electric Company
SVOC	semivolatile organic compound
TPH	total petroleum hydrocarbons
VOC	volatile organic compound

SUBAPPENDIX B21

AOC 24 Investigation Program

1.0 Introduction and Background

1.1 Background

Area of Concern (AOC) 24 consists of the formerly stained area near the former American Petroleum Institute (API) oil/water separator (OWS) structure and also includes the footprint of the former OWS. AOC 24 was incorporated into this work plan at the request of California Environmental Protection Agency, Department of Toxic Substances Control (DTSC, 2010). May 19, 1955 aerial photographs show a narrow, elongated area of dark staining near a structure located northeast of the north scrubbers. Recently located engineering drawings identify the structure as the former OWS (Pacific Gas and Electric Company, [PG&E], 1967a, 1993) located on the northern edge of the lower yard.

The unit is also visible in a January 26, 1954 photograph documenting the construction of the first three northern scrubbers and a subsequent (May 27, 1954) photo showing the completed scrubbers (DTSC, 2008). No staining is visible in either of these photos. However, staining is visible in a June 25, 1954 photo. It appears that the staining may have potentially came from a discharge emanating from the former OWS.

The API OWS was 14 feet long by 8 feet wide and had 1-foot-thick walls. The unit was 4 feet deep and had a 1-foot-thick concrete bottom. The unit was apparently installed during the initial construction of the station, as Drawing 382956 (PG&E, 1970) was released for construction on April 4, 1951. A section view of the former OWS is shown on Drawing 481785 (Revision 22). It is unknown whether the drawing represents as-built conditions because dates and information on early revisions are incomplete. The drawing shows the former OWS being connected to an 8-inch vitrified clay influent pipeline via an 8-inch Schedule 30 pipeline located aboveground on the slope between the upper and lower yards. The drawing indicates that effluent water from the former OWS was to be discharged via a "ditch to low area." However, no as-built drawings of the former API OWS have been located, and the actual discharge point of the effluent water is not known. The disposal process for the oil collected in the former OWS and the solid material removed from the bottom of the separator is unknown.

In approximately 1967, the former OWS was moved to the southern portion of the lower yard to allow for more effective gravity flow to the unit (PG&E 1968). The former OWS then became Unit 4.4 (discussed in Appendix B25) of the oily water treatment system. It is unknown if any part of the foundation remains in the former location. Discharges from the former OWS location in the northern part of lower yard would also have ceased in approximately 1967.

Subsequent to the 1955 aerial photo, additional grading was performed in the lower yard, and the northern portion of the lower yard was filled in late 1989.[1] Based on the available information, portions of the fill may be as much as 40 to 45 feet deep (PG&E 1989a-b).

1.2 Conceptual Site Model

A graphical conceptual site model has been developed for AOC 24 based on the above site history and background, as shown in Figure B21-1. (All tables and figures appear at the end of this subappendix.) Table B21-1 presents primary sources, primary source media, potential release mechanisms, secondary source media, and potential secondary release mechanisms for AOC 24. A detailed discussion of the migration pathways, exposure media, exposure routes, and receptors is included in the *Soil Part B Data Quality Objectives Technical Memorandum, PG&E Topock Compressor Station Needles, California* (CH2M HILL, 2011).

The primary sources of contamination at AOC 24 are likely to be historical water discharges from the former structure. The quantity of water released from the structure is unknown. There is a potential for the discharge to have been directed into the former low area north of the former northern boundary of the lower yard and from that low area into Bat Cave Wash. Due to the fill in northernmost portion of the lower yard, the affected area would now be covered by several to tens of feet of additional soil.

The primary source medium at AOC 24 was surface soil and may now be shallow or subsurface soil. Grading appears to have occurred throughout this area in the 1954 and 1955 photographs. Further grading is likely to have occurred subsequently during the fill of the lower area formerly present north of the north scrubbers and during construction of the Transwestern Pipeline interconnection facilities. Liquids released in AOC 24 would have been released to surface soil and would have infiltrated shallow soil. Liquids released to shallow soils could have infiltrated to deeper soils. If present, organic constituents in surface soils could have been degraded by heat and light. Because the entire AOC is covered with additional soil, as shown on Figure B21-2, runoff of contaminated surface soil in rainwater is not considered a potential migration pathway.

2.0 Summary of Past Soil Characterization

No data have been collected specifically to investigate AOC 24. Two opportunistic soil samples (AOC24-OS1 and AOC 24-OS2) have been collected in the vicinity of AOC 24. These opportunistic samples were analyzed for Title 22 metals, Contract Laboratory Program inorganics, polycyclic aromatic hydrocarbons (PAHs), pesticides, polychlorinated biphenyls (PCBs), and total petroleum hydrocarbons (TPH). Laboratory analytical results for these opportunistic samples are presented in Tables B21-2 through B21-7.

Twenty-four constituents, including one calculated quantity (benzo(a)pyrene equivalents), were detected in AOC 24. The detected constituents included:

[1] The fill was apparently placed in part to buttress the west slope below Cooling Tower B and the slope north of the northern scrubbers. Available documentation indicates that soil from the new evaporation pond excavation, as well as “from the small hill adjacent to the ravine located west of Cooling Tower B” was contemplated as fill for this area.

- Seventeen metals (aluminum, arsenic, barium, calcium, total chromium, hexavalent chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, sodium, vanadium, and zinc)
- Two pesticides (alpha-Chlordane and gamma- Chlordane)
- The PCB Aroclor-1254
- Two TPH-range compounds (TPH-diesel and TPH-motor-oil)
- Eleven PAHs and 1 calculated value (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, and benzo(a)pyrene equivalents)

Two metals (hexavalent chromium and lead) were detected at concentrations exceeding their respective background threshold values but were below their respective California human health screening levels for commercial use and United States Environmental Protection Agency Region 9 regional screening levels for commercial use (collectively referred to as commercial screening levels). No other constituents were detected above background or at concentrations that exceeded their respective commercial screening levels.

The results of these opportunistic samples will be combined with the results of the proposed sampling discussed in Section 3.3 of this subappendix. The complete data set will be evaluated for the five decisions discussed in Section 3.0 of this subappendix.

3.0 AOC 24 Data Gaps and Proposed Sampling

3.1 AOC 24 Data Gaps

Based on the site conceptual model and Part B data quality objectives, the following data gap was identified for Decision 1:

- Data Gap #1 – Lateral and vertical extents of contamination near the former OWS and stained soil

Data gaps for Decisions 2 through 5 are discussed in the main text of Appendix B and include:

- **Decision 2:** In general, with the exception of PAHs in shallow soil, existing data are adequate to support exposure point concentration development for detected chemicals that exceeded one or more comparison values. However, since semivolatile organic compound (SVOC) analysis, which includes PAHs, has been added to most soil samples collected within the fence line, this data gap has been addressed.
- **Decision 3:** Nature and extent (Decision 1) must be defined to fully assess Decision 3. Insufficient information is available to calculate soil screening levels protective of groundwater and to support screening-level groundwater modeling results, where necessary.

- **Decision 4:** Insufficient information is available to characterize the potential migration pathways from areas within the fence line to areas outside the fence line. An evaluation of the storm drain system and sheet flow runoff pathways is required. In addition, data are required to characterize surface soils in unpaved areas to define locations with chemicals of potential concern (COPCs) and chemicals of potential ecological concern above Part A interim screening levels that could become potential sources of COPCs and chemicals of potential ecological concern to areas outside the fence line.
- **Decision 5:** Various types of data will be needed to support the evaluation of technologies/remedial actions for the corrective measures study/feasibility study and potential interim measures, including soil physical parameters, constituent leachability data and, if remediation is required, waste characterization information and more detailed information on subsurface obstructions.

The proposed sample design is discussed in Section 3.3 of this subappendix.

3.2 AOC 24 Access Constraints

As discussed in Section 3.0 of Appendix B, there are substantial access constraints within the compressor station. AOC 24 is located in Area 1 on Figure B-3, Topock Compressor Accessibility Map, in the main text of Appendix B. The two proposed sampling locations for AOC 24 are in an unpaved area of the compressor station and are likely accessible by hydrovac. The accessibility assessment for each sampling location can be found in Table B21-8. Eighty-eight utility risers, including main gas, gas, odorant, wastewater, and electrical lines, are located in Area 1. Photograph 50 in Appendix B26 shows the accessibility constraints in AOC 24. Sample locations and depths identified for AOC 24 reflect the identified access constraints and the phased sampling approach described in Section 4.0 of Appendix B.

3.3 AOC 24 Proposed Sampling

Table B21-8 summarizes the proposed AOC 24 sample locations, depths, description/ rationale for each location (that is, the data gaps they would address), and analytes. Proposed sample locations are also shown in Figure B21-3. The figure also shows proposed sample locations for nearby solid waste management units and AOCs. The proposed AOC 24 sample locations were defined in collaboration with DTSC and United States Department of the Interior and will be optimized and sampled in accordance with the phased sampling approach outlined in Section 4.0 of Appendix B.

Based on the available information, COPCs for this unit consist of metals, TPH, and PAHs. COPCs are anticipated to be limited to soil only (CH2M HILL, 2007). Samples from this area will be analyzed for Title 22 metals, hexavalent chromium, volatile organic compounds (VOCs), TPH, SVOCs, PAHs, PCBs, and pH. Samples are proposed to be collected at two locations: AOC 24-1 and AOC 24-2. At AOC 24-1, samples will initially be sampled at the surface (0 to 1 foot below ground surface [bgs]) and shallow subsurface intervals (2 to 3 feet bgs) in accordance with the phased sampling protocol. Sample location AOC 24-2 is a designated deeper sample location, and samples are proposed to be collected at the surface (0 to 0.5 feet bgs), from 2 to 3 feet bgs, 5 to 6 feet bgs, and 9 to 10 feet bgs. Proposed samples for nearby AOCs will also be used to characterize soil for this unit, as shown on Figure B21-

2. Ten percent of all samples collected during the investigation will also be analyzed for the full suite of Target Analyte List/Target Compound List constituents.

To address the data needs associated with Decision 5, one sample will also be analyzed for soil characteristics, including grain size, washes (P200 sieve), Atterberg limits, and gradation. The sample has been tentatively identified in Table B21-8; the specific sample to be analyzed for these parameters will be confirmed in the field. Data will be reviewed and evaluated as described in the main text of Appendix B. In addition, to address potential concerns associated with leaching of COPCs to groundwater, select samples may be analyzed for soluble total chromium and hexavalent chromium using the SW1312 synthetic precipitation leaching procedure. Samples will be analyzed by synthetic precipitation leaching procedure only after initial sample results have been received, evaluated, and compared against the soil screening levels developed for Decision 3.

4.0 References

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Tables

TABLE B21-1
Conceptual Site Model, Area of Concern 24 – Stained Area Associated with Former Oil/Water Separator
Soil Investigation Part B Work Plan,
PG&E Topock Compressor Station, Needles, California

Primary Source	Primary Source Media	Potential Release Mechanism	Secondary Source Media	Potential Secondary Release Mechanism
Potential discharge of water from former separator	Surface Soil	Percolation and/or infiltration	Surface Soil Shallow Soil	Surface soil runoff, wind erosion and atmospheric dispersion of surface soil Potential volatilization and atmospheric dispersion Potential extracted groundwater[a]

Notes:

[a] Quantitative evaluation of the groundwater pathway was completed in the groundwater risk assessment (ARCADIS, 2009); Part B data will be reviewed in the data gaps assessment to evaluate potential fate impacts or current localized impacts to groundwater from soil.

TABLE B21-2
Sample Results: Metals
Area of Concern 24 – Stained Area and Former API Oil/Water Separator
Soil Investigation Part B Work Plan
Pacific Gas and Electric Company Topock Compressor Station Needles, California

				Metals (mg/kg)																	
Commercial Screening Level [1]:				**380**	**0.24**	**63,000**	**190**	**500**	**37**	**1,400**	**300**	**38,000**	**320**	**180**	**4,800**	**16,000**	**4,800**	**4,800**	**63**	**5,200**	**100,000**
RWQCB Environmental Screening Level [2]:				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Background [3]:				**NE**	**11**	**410**	**0.672**	**1.1**	**0.83**	**39.8**	**12.7**	**16.8**	**8.39**	**NE**	**1.37**	**27.3**	**1.47**	**NE**	**NE**	**52.2**	**58**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Antimony**	**Arsenic [4]**	**Barium**	**Beryllium**	**Cadmium**	**Chromium, Hexavalent**	**Chromium, total**	**Cobalt**	**Copper**	**Lead**	**Mercury**	**Molybdenum**	**Nickel**	**Selenium**	**Silver**	**Thallium**	**Vanadium**	**Zinc**
Category1																					
AOC24-OS1	12/14/11	0 - 0.5	N	ND (2.1)	3.8	190	ND (1)	ND (1)	**1.2**	30	5.1	9.3	**8.4**	ND (0.1)	ND (1)	9.7	ND (1)	ND (1)	ND (2.1J)	29	33
	12/14/11	1 - 2	N	ND (2.1)	3.3	200	ND (1)	ND (1)	0.76	26	5.8	9.6	7.8	ND (0.11)	ND (1)	11	ND (1)	ND (1)	ND (2.1)	31	36
AOC24-OS2	12/14/11	0 - 0.5	N	ND (2.1)	2.3	91	ND (1)	ND (1)	ND (0.41)	20	7.1	8	**17**	ND (0.1)	ND (1)	13	ND (1)	ND (1)	ND (2.1)	30	32
	12/14/11	1 - 2	N	ND (2.1)	3.4	170	ND (1)	ND (1)	ND (0.42)	16	4	6.9	6.4	ND (0.1)	ND (1)	7.8	ND (1)	ND (1)	ND (2.1)	25	27

Notes:

1 Commercial screening level - commercial DTSC CHHSL. If the commercial DTSC CHHSL is not established, the USEPA regional screening level is used.
2 RWQCB. 2008. "Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater" (Table K-1). May 27.
3 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.
4 Commercial screening level is below background value; therefore, arsenic results are only screened against the background value.

Results greater than or equal to the Background value are bolded. Results greater than or equal to the Commercial Screening level or RWQCB ESL are circled.
NE = not established
USEPA = United States Environmental Protection Agency
DTSC = California Department of Toxic Substances Control
RWQCB = California Regional Water Quality Control Board
CHHSL = California human health screening levels
-- = not analyzed
FD = Field Duplicate
ft bgs = feet below ground surface
J = concentration or reporting limit estimated by laboratory or data validation
mg/kg = milligrams per kilogram
N = Primary Sample
ND = not detected at the listed reporting limit

TABLE B21-3

Sample Results: Contract Laboratory Program Inorganics

Area of Concern 24 – Stained Area and Former API Oil/Water Separator

Soil Investigation Part B Work Plan

Pacific Gas and Electric Company Topock Compressor Station Needles, California

				Contract Laboratory Program (CLP) Inorganics (mg/kg)							
Commercial Screening Level [1]:				**990,000**	**NE**	**20,000**	**720,000**	**NE**	**23,000**	**NE**	**NE**
RWQCB Environmental Screening Level [2]:				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Background [3]:				**16,400**	**66,500**	**NE**	**NE**	**12,100**	**402**	**4,400**	**2,070**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Aluminum**	**Calcium**	**Cyanide**	**Iron**	**Magnesium**	**Manganese**	**Potassium**	**Sodium**
Category1											
AOC24-OS1	12/14/11	0 - 0.5	N	7,600	31,000	ND (0.25)	14,000	6,300	260 J	1,600	1,100

Notes:

1 Commercial screening level - commercial DTSC CHHSL. If the commercial DTSC CHHSL is not established, the USEPA regional screening level is used.

2 RWQCB. 2008. "Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater" (Table K-1). May 27.

3 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the Background value are bolded. Results greater than or equal to the Commercial Screening level or RWQCB ESL are circled.

NE = not established

USEPA = United States Environmental Protection Agency

DTSC = California Department of Toxic Substances Control

RWQCB = California Regional Water Quality Control Board

CHHSL = California human health screening levels

-- = not analyzed

FD = Field Duplicate

ft bgs = feet below ground surface

J = concentration or reporting limit estimated by laboratory or data validation

mg/kg = milligrams per kilogram

N = Primary Sample

ND = not detected at the listed reporting limit

TABLE B21-4

Sample Results: Polycyclic Aromatic Hydrocarbons

Area of Concern 24 – Stained Area and Former API Oil/Water Separator

Soil Investigation Part B Work Plan

Pacific Gas and Electric Company Topock Compressor Station Needles, California

				Polycyclic Aromatic Hydrocarbons (µg/kg)																		
Commercial Screening Level 1				**99,000**	**4,100,000**	**33,000,000**	**17,000,000**	**170,000,000**	**1,300**	**130**	**1,300**	**17,000,000**	**1,300**	**13,000**	**380**	**22,000,000**	**22,000,000**	**1,300**	**18,000**	**17,000,000**	**17,000,000**	**130**
RWQCB Environmental Screening Level 2				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Background 3				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**1-Methyl naphthalene**	**2-Methyl naphthalene**	**Acenaphthene**	**Acena phthylene**	**Anthracene**	**Benzo (a) anthracene**	**Benzo (a) pyrene**	**Benzo (b) fluoranthene**	**Benzo (ghi) perylene**	**Benzo (k) fluoranthene**	**Chrysene**	**Dibenzo (a,h) anthracene**	**Fluoranthene**	**Fluorene**	**Indeno (1,2,3-cd) pyrene**	**Naphthalene**	**Phen anthrene**	**Pyrene**	**B(a)P Equivalent**
Category1																						
AOC24-OS1	12/14/11	0 - 0.5	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	12	10	26	5.2	10	17	ND (5.2)	26	ND (5.2)	ND (5.2)	ND (5.2)	8.3	24	16
	12/14/11	1 - 2	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	45	44	100	17	28	50	5.2	85	ND (5.2)	18	ND (5.2)	33	76	65
AOC24-OS2	12/14/11	0 - 0.5	N	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (4.5)
	12/14/11	1 - 2	N	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	14	ND (5.2)	30	6.6	8.3	13	ND (5.2)	24	ND (5.2)	5.9	ND (5.2)	ND (5.2)	23	9.4

Notes:

1 Commercial screening level - commercial DTSC CHHSL. If the commercial DTSC CHHSL is not established, the USEPA regional screening level is used.

2 RWQCB. 2008. "Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater" (Table K-1). May 27.

3 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the Background value are bolded. Results greater than or equal to the Commercial Screening level or RWQCB ESL are circled.

NE = not established

USEPA = United States Environmental Protection Agency

DTSC = California Department of Toxic Substances Control

RWQCB = California Regional Water Quality Control Board

CHHSL = California human health screening levels

Calculations:

BaP equivalent = Sum of Result x TEF, 1/2 reporting limit used for nondetects. If all PAHs are nondetect, the final qualifier code is U.

-- = not analyzed

µg/kg = micrograms per kilogram

FD = Field Duplicate

ft bgs = feet below ground surface

J = concentration or reporting limit estimated by laboratory or data validation

N = Primary Sample

ND = not detected at the listed reporting limit

TABLE B21-5

Sample Results: Total Petroleum Hydrocarbons

Area of Concern 24 – Stained Area and Former API Oil/Water Separator

Soil Investigation Part B Work Plan

Pacific Gas and Electric Company Topock Compressor Station Needles, California

				Total Petroleum Hydrocarbons (mg/kg)	
Commercial Screening Level [1]:				**NE**	**NE**
RWQCB Environmental Screening Level [2]:				**540**	**1,800**
Background [3]:				**NE**	**NE**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**TPH as diesel**	**TPH as motor oil**
Category1					
AOC24-OS1	12/14/11	0 - 0.5	N	77	430
	12/14/11	1 - 2	N	39	200
AOC24-OS2	12/14/11	0 - 0.5	N	ND (10)	ND (10)
	12/14/11	1 - 2	N	ND (10)	32

Notes:

1 Commercial screening level - commercial DTSC CHHSL. If the commercial DTSC CHHSL is not established, the USEPA regional screening level is used.

2 RWQCB. 2008. "Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater" (Table K-1). May 27.

3 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the Background value are bolded. Results greater than or equal to the Commercial Screening level or RWQCB ESL are circled.

NE = not established

USEPA = United States Environmental Protection Agency

DTSC = California Department of Toxic Substances Control

RWQCB = California Regional Water Quality Control Board

CHHSL = California human health screening levels

TPH = Total Petroleum Hydrocarbon

-- = not analyzed

FD = Field Duplicate

ft bgs = feet below ground surface

J = concentration or reporting limit estimated by laboratory or data validation

mg/kg = milligrams per kilogram

N = Primary Sample

ND = not detected at the listed reporting limit

TABLE B21-6

Sample Results: Polychlorinated Biphenyls

Area of Concern 24 – Stained Area and Former API Oil/Water Separator

Soil Investigation Part B Work Plan

Pacific Gas and Electric Company Topock Compressor Station Needles, California

				Polychlorinated biphenyls (µg/kg)								
			Commercial Screening Level [1]:	21,000	540	540	740	740	740	740	740	740
			RWQCB Environmental Screening Level [2]:	NE	NE	NE	NE	NE	NE	NE	NE	NE
			Background [3]:	NE	NE	NE	NE	NE	NE	NE	NE	NE
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Aroclor 1016**	**Aroclor 1221**	**Aroclor 1232**	**Aroclor 1242**	**Aroclor 1248**	**Aroclor 1254**	**Aroclor 1260**	**Aroclor 1262**	**Aroclor 1268**
Category1												
AOC24-OS1	12/14/11	0 - 0.5	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)
	12/14/11	1 - 2	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	30	ND (17)	ND (17)	ND (17)
AOC24-OS2	12/14/11	0 - 0.5	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)
	12/14/11	1 - 2	N	ND (17)	ND (34)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)

Notes:

1 Commercial screening level - commercial USEPA regional screening levels

2 RWQCB. 2008. "Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater" (Table K-1). May 27.

3 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the Background value are bolded. Results greater than or equal to the Commercial Screening level or RWQCB ESL are circled.

NE = not established

USEPA = United States Environmental Protection Agency

DTSC = California Department of Toxic Substances Control

RWQCB = California Regional Water Quality Control Board

CHHSL = California human health screening levels

-- = not analyzed

µg/kg = micrograms per kilogram

FD = Field Duplicate

ft bgs = feet below ground surface

J = concentration or reporting limit estimated by laboratory or data validation

N = Primary Sample

ND = not detected at the listed reporting limit

TABLE B21-7
Sample Results: Pesticides
Area of Concern 24 – Stained Area and Former API Oil/Water Separator
Soil Investigation Part B Work Plan
Pacific Gas and Electric Company Topock Compressor Station Needles, California

				Pesticides (µg/kg)																				
Commercial Screening Level [1]				**9,000**	**6,300**	**6,300**	**130**	**270**	**1,700**	**960**	**270**	**130**	**3,700,000**	**3,700,000**	**3,700,000**	**230,000**	**230,000**	**230,000**	**2,000**	**1,700**	**520**	**190**	**3,800,000**	**1,800**
RWQCB Environmental Screening Level [2]				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Background [3]				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	4,4-DDD	4,4-DDE	4,4-DDT	Aldrin	alpha-BHC	alpha-Chlordane	beta-BHC	delta-BHC	Dieldrin	Endo sulfan I	Endo sulfan II	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC	gamma-Chlordane	Heptachlor	Heptachlor Epoxide	Methoxy chlor	Toxaphene
Category1																								
AOC24-OS1	12/14/11	0 - 0.5	N	ND (2.1)	ND (2.1)	ND (2.1)	ND (1)	ND (1)	1.7	ND (1)	ND (1)	ND (2.1)	ND (1)	ND (2.1)	ND (2.1)	ND (2.1)	ND (2.1)	ND (2.1)	ND (1)	1.6 J	ND (1)	ND (1)	ND (5.2)	ND (52)
	12/14/11	1 - 2	N	ND (2.1)	ND (2.1)	ND (2.1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (2.1)	ND (1)	ND (2.1)	ND (2.1)	ND (2.1)	ND (2.1)	---	ND (1)	ND (1)	ND (1)	ND (1)	ND (5.2)	ND (52)
AOC24-OS2	12/14/11	0 - 0.5	N	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (2)	ND (1)	ND (2)	ND (2)	ND (2)	ND (2)	---	ND (1)	ND (1)	ND (1)	ND (1)	ND (5.1)	ND (51)
	12/14/11	1 - 2	N	ND (2.1)	ND (2.1)	ND (2.1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (2.1)	ND (1)	ND (2.1)	ND (2.1)	ND (2.1)	ND (2.1)	---	ND (1)	ND (1)	ND (1)	ND (1)	ND (5.2)	ND (52)

Notes:

1 Commercial screening level - commercial DTSC CHHSL. If the commercial DTSC CHHSL is not established, the USEPA regional screening level is used.
2 RWQCB. 2008. "Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater" (Table K-1). May 27.
3 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the Background value are bolded. Results greater than or equal to the Commercial Screening level or RWQCB ESL are circled.
NE = not established
USEPA = United States Environmental Protection Agency
DTSC = California Department of Toxic Substances Control
RWQCB = California Regional Water Quality Control Board
CHHSL = California human health screening levels
-- = not analyzed
µg/kg = micrograms per kilogram
FD = Field Duplicate
ft bgs = feet below ground surface
J = concentration or reporting limit estimated by laboratory or data validation
N = Primary Sample
ND = not detected at the listed reporting limit

TABLE B21-8
Proposed Sampling Program, Area of Concern 24 – Stained Area Associated with Former Oil/Water Separator
Soil Investigation Part B Work Plan
PG&E Topock Compressor Station, Needles, California

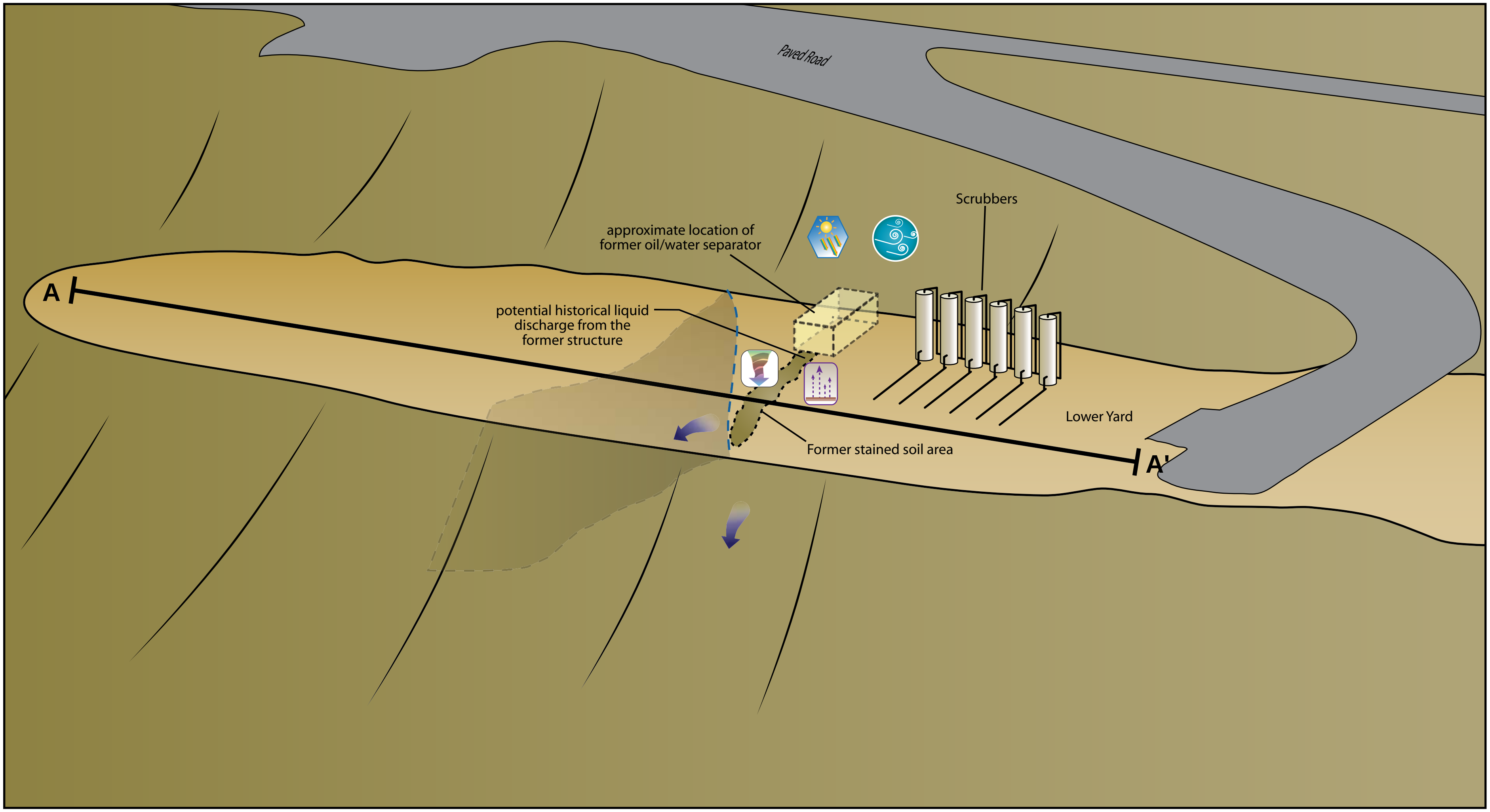
Location	Depths (feet)	Description/Rationale	Analytes	Accessibility Assessment
AOC 24-1	0-0.5 and 3, if feasible	To resolve Data Gap #1, lateral and vertical extents of contamination near the stained soil	Title 22 metals, hexavalent chromium, VOCs, TPH, SVOCs, PAHs, PCBs, and pH	Suitable for x-ray fluorescence Likely accessible by hydrovac
AOC 24-2	0-0.5 and 3, 6, and 10 feet bgs if feasible	To resolve Data Gap #1, lateral and vertical extents of contamination near the stained soil	Title 22 metals, hexavalent chromium, VOCs, TPH, SVOCs, PAHs, PCBs, and pH; also will be analyzed for soil characteristics, including grain size, washes (P200 sieve), Atterberg limits, and gradation.	Suitable for x-ray fluorescence Likely accessible by hydrovac

Notes:

Ten percent of samples from the investigation will be analyzed for Target Analyte List/Target Compound List constituents.

VOC analysis will not be conducted on surface soil samples (0 to 0.5 foot bgs).

Figures



NOT TO SCALE

LEGEND

Potential Release Mechanisms

Windblown Dispersion

Volatilization

Degradation by Heat/Light

Infiltration

Infrequent Surface Water Runoff

Approximate former edge of lower yard (prior to 1990)

Approximate location of cross section

FIGURE B21-1
Conceptual Site Model for AOC24
Stained Area and Former API Oil/
Water Separator
Soil Investigation Part B Work Plan
PG&E Topock Compressor Station
Needles, California

CH2MHILL.

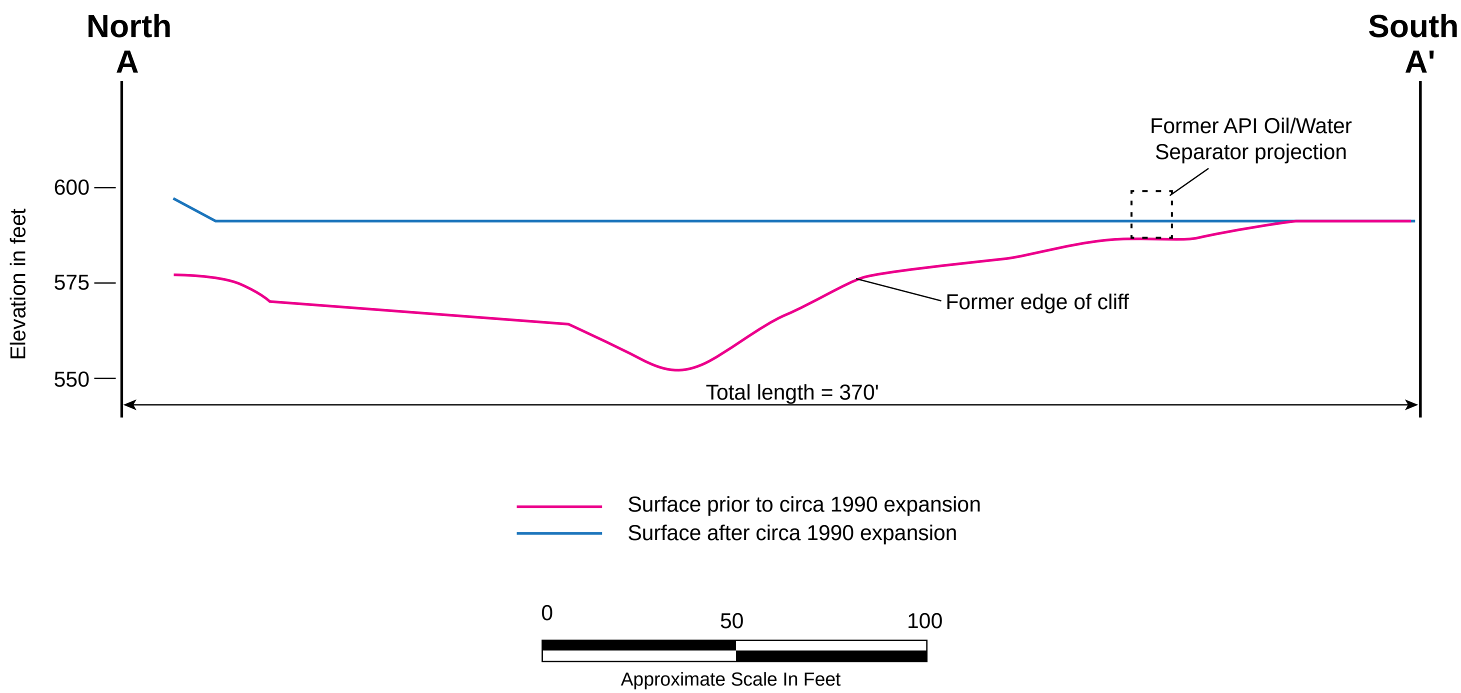


FIGURE B21-2
Approximate Cross Section of AOC24
Stained Area and Former API Oil/
Water Separator
Soil Investigation Part B Work Plan
PG&E Topock Compressor Station
Needles, California

CH2MHILL.

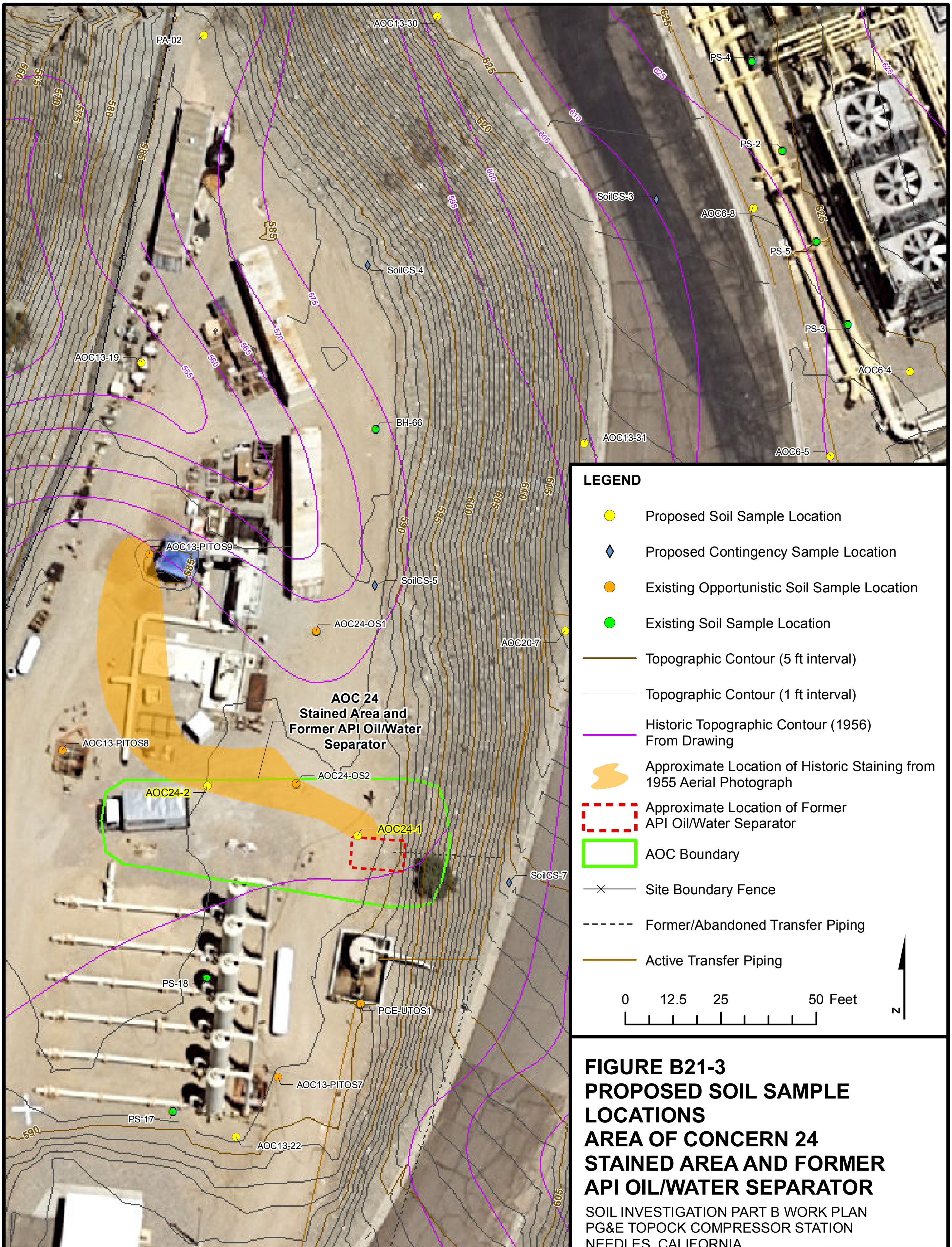


FIGURE B21-3
PROPOSED SOIL SAMPLE LOCATIONS
AREA OF CONCERN 24
STAINED AREA AND FORMER API OIL/WATER SEPARATOR

SOIL INVESTIGATION PART B WORK PLAN
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

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Subappendix B22
AOC 25 – Compressor and Generator Engine Basements Investigation Program

Contents

Acronyms and Abbreviations

AOC	Area of Concern
COPC	chemical of potential concern
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
mg/kg	milligrams per kilogram
OWS	oil/water separator
PG&E	Pacific Gas and Electric Company
TPH	total petroleum hydrocarbons
TRPH	total recoverable petroleum hydrocarbons

SUBAPPENDIX B22

AOC 25 Investigation Program

1.0 Introduction and Background

1.1 Background

Area of Concern (AOC) 25 consists of the compressor station engines and associated basements and the auxiliary (generator) engines and associated basements. AOC 25 was incorporated into this work plan at the request of California Environmental Protection Agency, Department of Toxic Substances Control (DTSC, 2010). The Compressor Building contains 10 compressor engines; nine of these engines are currently active. The Auxiliary Building houses four generators that provide electricity to the station. The compressors and generators are fueled by natural gas.

1.1.1 Compressor Engine Basements

Each compressor engine is mounted on a concrete block; the top of the concrete pedestal is level with the floor of the building. Each concrete pedestal is surrounded by an open concrete trench. This open area is referred to as the compressor engine basement. The basements for each unit extend across the entire width of the Compressor Building and have small openings (open air windows) on each side of the building to allow pipes to enter the basement. The lower edge of the openings is approximately 36 inches above the floor of the basement. Each compressor basement is also equipped with two drains that are connected to the oily water treatment system. The basements provide access to piping leading to and from the compressor engines, as well as to the lower portions of the compressor engines themselves. During normal operation, the basements are covered with solid trench plates. Incidental drips and leaks from the compressor engines would enter the basements and would be discharged to the drains connected to the oily water treatment system.

The pedestals are approximately 57 inches high. The bottom of the basement is also concrete and is approximately 2 feet thick (Pacific Gas and Electric Company [PG&E], 1953). Concrete sampling of select compressor pedestals was conducted in 1990 to evaluate cracks in the concrete pedestals. The sampling indicated that oil saturation was present to depths of 10 to 30 inches into the top of the concrete, with the deeper penetrations occurring at the location of the cracks. The concrete sampling work was performed to assist with the selection of future pedestal replacements. Pedestals have been repaired at Compressor Engines 1, 3, 5, 6, 7, 8, 9, and 10. The pedestals were repaired between the late 1980s and 2004. Pedestals were removed only to the point required to reach competent concrete; the new concrete was then tied into the existing concrete.

1.1.2 Generator Engine Basements

The generators are equipped with basements similar to the compressors; however, the basements are present only on the south and east sides of the generator engines and are shallower than the compressor engine basements (approximately 30 inches deep). The generator engines are also located on pedestals. The pedestals are approximately 42 inches high measured from the bottom of the engine basement.

The generator basements are shallower, have only one drain, and only have an open air window on the east side of the Auxiliary Building. The bottom of the window opening is level with the basement floor. Incidental drips and leaks from the generator engines that collect in the basements would be discharged to drains connected to the oily water treatment system and could also leak out through the basement window. The area outside the generator engine basements was paved with concrete in the early 1990s.

Similar to the compressor engines, the generator engine foundations were also tested (PG&E, 1992). Oil penetration and decomposing concrete were noted at the four generator engines at Topock. The generator engine pedestals were repaired between 2001 and 2007 in the same way as the compressor engine pedestals. Data from four samples collected during the replacement of the Generator P-2 and P-4 pedestals (BC Laboratories 2005, 2006) indicated oil and grease were present in the waste concrete samples at concentrations ranging from 18,000 to 37,000 milligrams per kilogram (mg/kg); no screening level exists for oil and grease. The concrete samples were also analyzed for Title 22 metals. All metals concentrations were well below commercial screening levels.

The basements were not intended or designed to serve as holding areas for large quantities of liquids. The two types of liquids present in the compressor and generator engines are lubricating oil and cooling water. When the lubricating oil is drained from the compressor or generator engines during engine maintenance, it is, and historically has been, drained directly to a holding tank via piping specifically installed for that purpose. Cooling water was contained in a closed-loop system. When this system was drained, the water was combined with the oily water and was routed to the oil/water separator (OWS). The OWS effluent was then combined with the cooling-tower blowdown. Currently, the cooling water is still drained to the OWS through the industrial drains. The engine basements are cleaned periodically to remove surface coatings of oil; the cleaning water is allowed to drain to the oily water treatment system.

PG&E has taken various steps to minimize leakage into the compressor engine basements. For example, historical information (GM 459732[1]) indicated that oil leakage from the compressor engines was cleaned up by plant staff daily. In 1971, new mechanical valve seals were installed under GM 459732 to minimize the leakage. Similarly, in 1968, PG&E upgraded pipe joints from the cooling-water headers to the compressor engines to minimize the potential for cooling-water leaks prior to increasing the operating pressure of the cooling-water system (PG&E, 1971).

Some site investigation and soil removal has been conducted adjacent to the east side of the Auxiliary Building in AOC 13. This area was formerly unpaved and is now covered with concrete. Prior to the installation of the concrete apron, visibly stained soil was removed, and 18 soil samples were collected and analyzed for total petroleum hydrocarbon (TPH) constituents (TPH-gasoline, TPH-diesel, TPH-motor oil, TPH-heavy-oil); of these, eight samples were also analyzed for lead. Samples were collected from 0 to 2.5 feet below ground surface. Five samples were analyzed for total recoverable petroleum hydrocarbons

[1] GMs are internal project justification, costing and tracking documents used by PG&E.

(TRPH); these samples were collected from 1 to 3 feet below ground surface. All sample data are data quality Category 3 and are located in areas now covered by the concrete apron.

Lead was detected in all eight samples analyzed at concentrations ranging from 8 to 31 mg/kg. None of these concentrations exceeds the commercial screening value (California human health screening level for commercial use). TPH-motor-oil and TRPH were the only TPH constituents detected. TPH-motor-oil was detected in 13 of 17 samples analyzed for this constituent, and TRPH was detected in all five samples analyzed for this constituent. Detected concentration of TPH-motor-oil ranged from 24 to 46,900 mg/kg; three samples exceeded the California Regional Water Quality Control Board environmental screening level of 1,800 mg/kg. TRPH was detected a concentrations ranging from 10,100 to 85,000 mg/kg; no screening level exists for this compound.

Four soil samples were also collected near the Aqua Tower System in October 2000 and were analyzed for Title 22 metals. All metals concentrations in three of the samples were below background concentrations. Copper, lead, and nickel slightly exceeded background concentrations in sample Aqua Tower Soil #1-2 (BC Laboratories, 2000).

1.2 Conceptual Site Model

A graphical conceptual site model has been developed for AOC 25 based on the above site history and background, as shown in Figure B22-1. (All tables and figures appear at the end of this subappendix.) Table B22-1 presents primary sources, primary source media, potential release mechanisms, secondary source media, and potential secondary release mechanisms for AOC 25. A detailed discussion of the migration pathways, exposure media, exposure routes, and receptors is included in the *Soil Part B Data Quality Objectives Technical Memorandum, PG&E Topock Compressor Station Needles, California* (CH2M HILL, 2011).

The primary sources of contamination at AOC 25 are likely to be small-scale historic liquid discharges from the compressor and generator engines, including small quantities of lubricating oil, cleaning fluids, and coolant. The estimated annual flow of oily wastewater is 220,000 gallons (CH2M HILL, 2007); a portion of this total derives from the drains in the compressor and auxiliary buildings. The construction of the compressor basements largely precludes releases of fluids from the basements to the soil adjacent to the buildings. Only if there had been massive failure of an engine or a cooling-water line would large quantities of liquids have been generated and had any potential to overflow out of the compressor basement to areas adjacent to the buildings. There are no records of any such events.

Unlike the compressor basements, the generator engine basements would have been more likely to have leaked oily water and cooling liquid to the area immediately outside the building because the bottoms of the windows were at the same level as the basement floors. Stained soil was removed from this area, and the area was subsequently paved with concrete.

The primary source media at AOC 25 are surface soil, shallow soil, and concrete. Liquids released to the drains could have entered shallow soils at breaks in the oily water system pipelines; from shallow soil, the liquid could have infiltrated to deeper soils. Leaks to surface soil outside the generator engine basements could have infiltrated to shallow soil; from shallow soil, the liquid could have infiltrated to deeper soils. Liquids released to the basements could also have impacted the concrete. Liquids released to the concrete could have penetrated cracks in the foundation and could have entered surface and shallow soil underneath the basements. However, the concrete is between 24 and 81 inches thick and is steam-cleaned periodically. Therefore, the concrete is not considered a major source. Because the entire potential surface soil source area is covered by concrete or asphalt, runoff of contaminated surface soil is not considered a potential migration pathway.

2.0 AOC 25 Nature and Extent Data Gaps Evaluation

No data have been collected from the compressor engine or generator engine basements. Oil is known to have been released to a portion of the compressor and generator engine pedestals and basement floors; however, no data are available to determine whether the oil reached the underlying soil or to determine the condition of the soil below the building foundation. Surface soil data are available for the areas immediately adjacent to the compressor and auxiliary buildings; however, these data address potential leaks and drips from the pipes and other equipment adjacent to the buildings and are not related to the basements. These data are evaluated as part of AOC 13 in Appendix B11.

3.0 AOC 25 Data Gaps and Proposed Sampling

3.1 AOC 25 Data Gaps

Based on the site conceptual model and Part B data quality objectives, the following data gap was identified for Decision 1:

- Data Gap #1 – Lateral and vertical extents of contamination underneath the compressor and auxiliary buildings and the associated basements

Data gaps for Decisions 2 through 5 are discussed in the main text of Appendix B and include:

- **Decision 2:** In general, with the exception of polycyclic aromatic hydrocarbons in shallow soil, existing data are adequate to support exposure point concentration development for detected chemicals that exceeded one or more comparison values. However, since semivolatile organic compound analysis, which includes polycyclic aromatic hydrocarbons, has been added to most soil samples collected within the fence line, this data gap has been addressed.

- **Decision 3:** Nature and extent (Decision 1) must be defined to fully assess Decision 3. Insufficient information is available to calculate soil screening levels protective of groundwater and to support screening-level groundwater modeling results, where necessary.

- **Decision 4:** Insufficient information is available to characterize the potential migration pathways from areas within the fence line to areas outside the fence line. An evaluation of the storm drain system and sheet flow runoff pathways is required. In addition, data are required to characterize surface soils in unpaved areas to define locations with chemicals of potential concern (COPCs) and chemicals of potential ecological concern above Part A interim screening levels that could become potential sources of COPCs and chemicals of potential ecological concern to areas outside the fence line. However, given that any potential releases to soil at this AOC are completely covered by building foundations potential migration of constituents from this AOC to areas outside the fence line is not considered a data gap.

- **Decision 5:** Various types of data will be needed to support the evaluation of technologies/remedial actions for the corrective measures study/feasibility study and potential interim measures, including soil physical parameters, constituent leachability data and, if remediation is required, waste characterization information and more detailed information on subsurface obstructions.

The proposed sample design is discussed in Section 3.3 of this subappendix.

3.2 AOC 25 Access Constraints

As discussed in Section 3.0 of Appendix B, there are substantial access constraints within the compressor station. AOC 25 is located in Area 8 (Compressor Building) and 14 (Auxiliary Building) on Figure B-3, Topock Compressor Station Accessibility Map, in the main text of Appendix B. Eighty-nine utility risers, including main gas, gas, electrical, air, lubricating oil, lubricating oil cooling water, and jacket cooling water lines, are located in Area 8. Twenty-six utility risers, including main gas, gas, electrical, air, auxiliary lubricating-oil cooling water, and water lines, are located in Area 14. In addition, a pipe trench and five vaults were identified in Area 14. Photographs 51 through 56 in Appendix B25 show the accessibility constraints in AOC 25. The Compressor Building has a thick concrete foundation and use of equipment that may generate sparks is not permitted in the building. The Auxiliary Building also has a thick concrete foundation. Due to the active use of the buildings and physical danger associated with working in the buildings, no sampling is proposed within the buildings. Soil samples have been collected around the compressor and auxiliary buildings (these samples are located in AOC 13, discussed in Appendix B11), and several more are proposed to be collected for AOC 13. These proposed and existing sample locations are shown on Figure B22-2. Three soil gas samples will also be collected in AOC 13 adjacent to the Compressor Building, as shown on Figure B11-2. Proposed samples for nearby AOCs will also be used to characterize soil for this unit. Detailed discussions of the existing and proposed sample locations are provided in Appendix B11.

4.0 References

ARCADIS. 2009. *Technical Memorandum 4: Ecological Comparison Values for Additional Detected Chemicals in Soil.* July 1.

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__________. 2005. Project: Misc. Samples; Project Number: P-2 Foundation. Reported September 1.

__________. 2006. Project: Misc. Samples; Project Number: P-4 Foundation. Reported March 16.

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CH2M HILL. 2007. *Revised Final RCRA Investigation/Remedial Investigation Report, Volume 1 - Site Background and History, PG&E Topock Compressor Station, Needles, California.* August 10.

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Pacific Gas and Electric Company (PG&E). 1953. Engineering Drawing 482377, Revision 1: *Compressor Foundation Plan and Details, Compressor Building Expansion, Topock Compressor Station.* January 28.

__________. 1971. G.M. No. 437490 -- *Install Flexmaster Pipe Joints on GMW Cooling Water Headers at Topock Compressor Station*. Completed May 15, 1968; closed November 30, 1971.

__________. 1992. Internal memorandum from Gas Engineering and Construction to Various: *Southern Pipeline Operations – Foundation Core Study Meeting Summary.*

Table

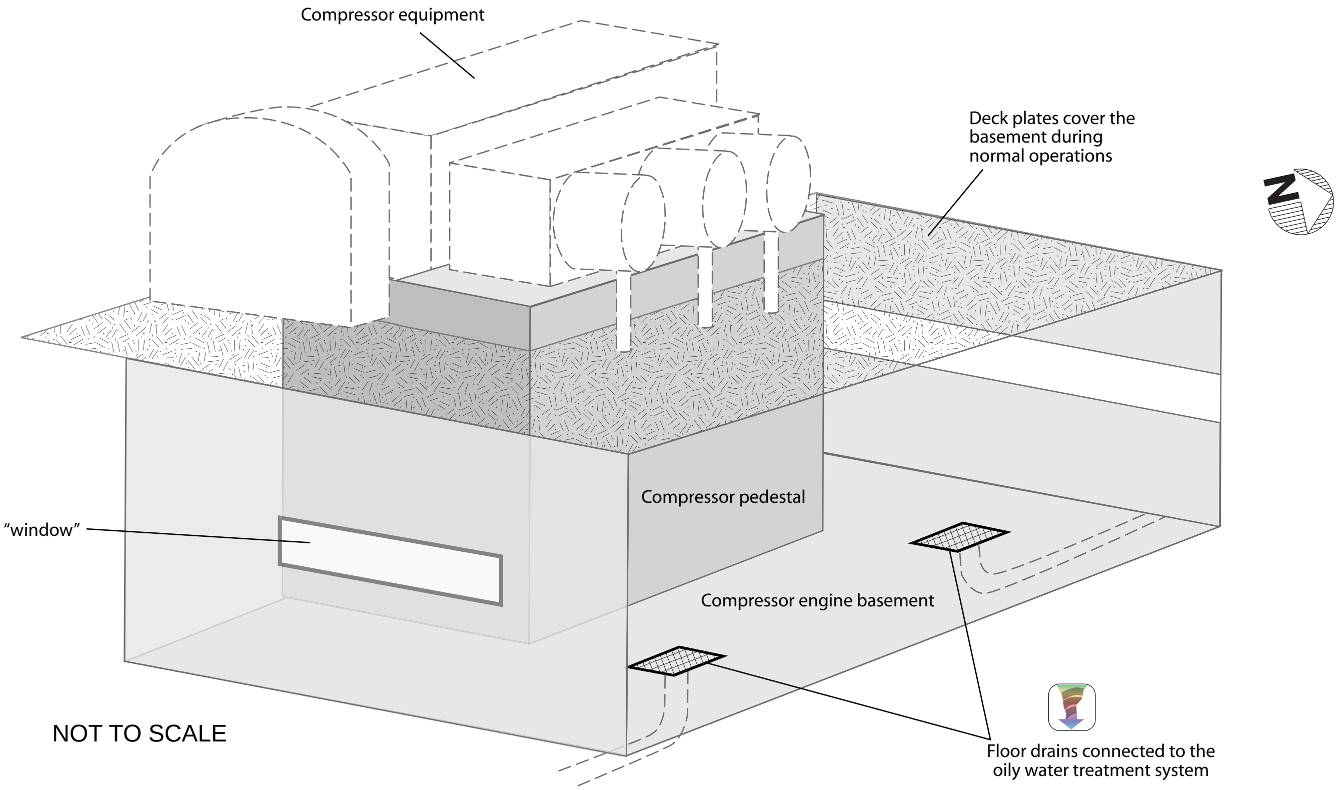
TABLE B22-1
Conceptual Site Model, AOC 25 – Compressor and Generator Engine Basements
Soil Investigation Part B Work Plan,
PG&E Topock Compressor Station, Needles, California

Primary Source	Primary Source Media	Potential Release Mechanism	Secondary Source Media	Potential Secondary Release Mechanism
Potential historical liquids discharges (spills) and leaks (possible discharge to storm drain system and discharge offsite)	Surface Soil	Percolation and/or infiltration	Surface Soil	Wind erosion and atmospheric dispersion of surface soil
			Shallow Soil	Potential volatilization and atmospheric dispersion/ enclosed space accumulation
				Potential extracted groundwater[a]

Notes:

[a] Quantitative evaluation of the groundwater pathway was completed in the groundwater risk assessment (ARCADIS, 2009); Part B data will be reviewed in the data gaps assessment to evaluate potential fate impacts or current localized impacts to groundwater from soil.

Figures



LEGEND

Potential Release Mechanisms

Infiltration

FIGURE B22-1
Conceptual Site Model for AOC25
Compressor and Generator Engine Basements
Soil Investigation Part B Work Plan
PG&E Topock Compressor Station
Needles, California

CH2MHILL.

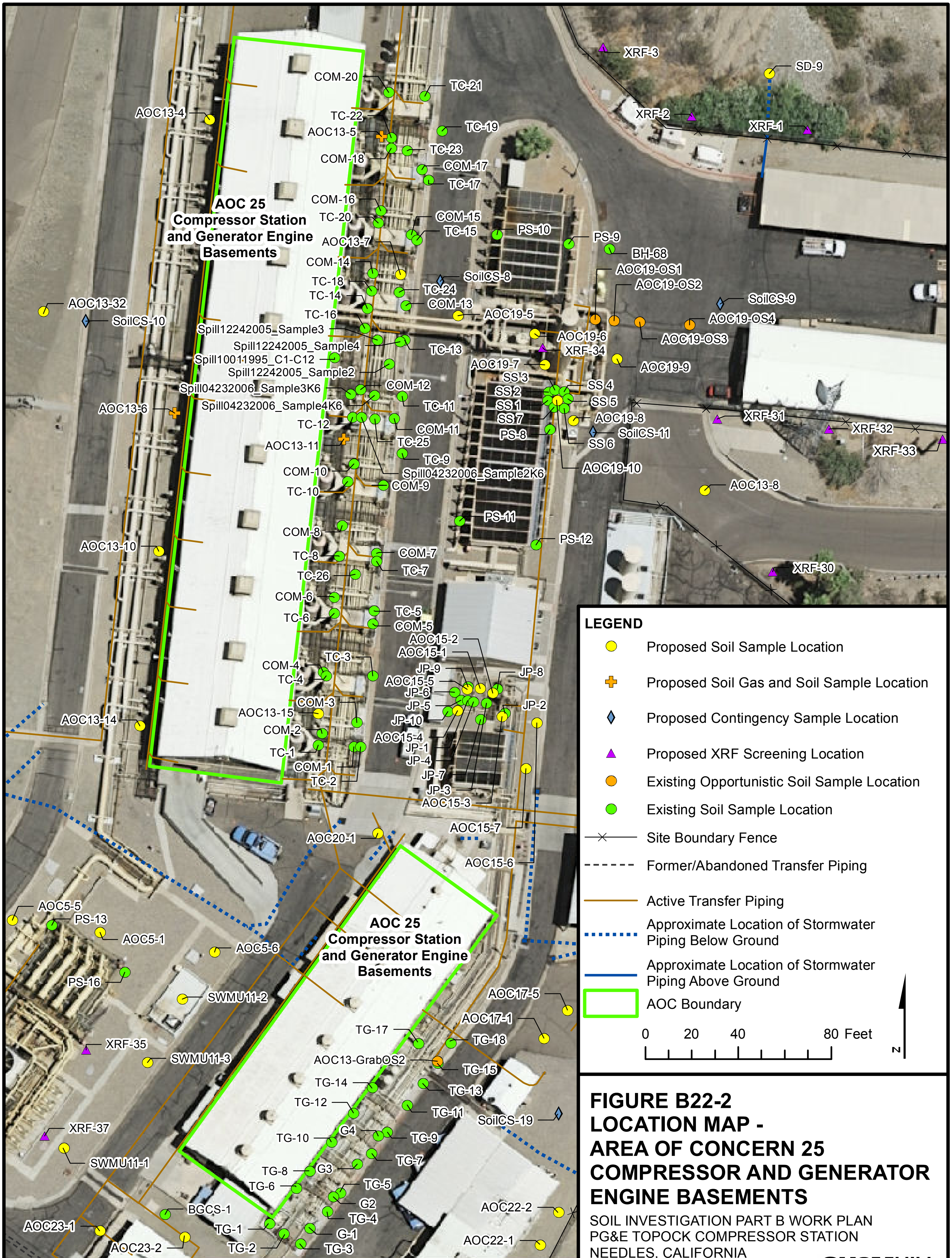


FIGURE B22-2
LOCATION MAP - AREA OF CONCERN 25 COMPRESSOR AND GENERATOR ENGINE BASEMENTS

SOIL INVESTIGATION PART B WORK PLAN
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

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Subappendix B23
AOC 26 – Former Scrubber Oil Sump Investigation Program

Contents

Acronyms and Abbreviations

AOC	Area of Concern
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
BTV	background threshold value
CAM	California Assessment Manual
COPC	chemical of potential concern
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
E&E	Ecology and Environment, Inc.
mg/kg	milligrams per kilogram
mg/L	milligram per liter
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PG&E	Pacific Gas and Electric Company
SVOC	semivolatile organic compound
TPH	total petroleum hydrocarbons
Trident	Trident Environmental Consultants
TRPH	total recoverable petroleum hydrocarbons
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound

SUBAPPENDIX B23

AOC 26 Investigation Program

1.0 Introduction and Background

1.1 Background

Area of Concern (AOC) 26, the Scrubber Oil Sump (scrubber sump) was located in the lower yard south of the south scrubbers and was removed May 15, 1996. AOC 26 was incorporated into this work plan at the request of California Environmental Protection Agency, Department of Toxic Substances Control (DTSC, 2010). The scrubber sump was removed as part of an upgrade of the waste-oil system and was replaced with a pipeline liquids-collection point. Waste oil from the scrubber sump was pumped to the waste-oil sump in the upper yard (part of AOC 32), and pipeline liquids from the collection point continue to be pumped directly to the waste-oil sump.

The scrubber sump consisted of an underground concrete structure with three compartments, each measuring 5 feet wide by 5 feet long (including walls) by 4 feet deep. Drawings uncovered during the engineering file review provide an accurate configuration of the scrubber sump (Pacific Gas and Electric Company [PG&E], 1951), as well as its location relative to existing piping (PG&E, 1994). The location of the scrubber sump is shown in Figure B23-1. The scrubber sump received pipeline liquids removed from two banks of natural gas scrubbers. When the northern compartment of the scrubber sump filled up, the pipeline liquids were either transferred to one of the other two compartments or were pumped directly to the waste-oil sump (Trident Environmental Consultants [Trident], 1996a).

Closure of the sump consisted of the following steps:

- Piping was emptied, disconnected, and capped at abandoned ends.
- Residual liquid was removed from the sump by vacuum.
- Oily sludge in the sump was removed, placed into 55-gallon drums, and disposed of at a Class I landfill as non-RCRA hazardous waste.
- The sump was steam-cleaned after removal of the liquids and sludge and was completely removed from the site.
- Discolored soil was excavated and stockpiled.
- Stockpiled soils were analyzed for California Assessment Manual (CAM) 17 metals; total petroleum hydrocarbons (TPH) using United States Environmental Protection Agency (USEPA) Method 418.1; and benzene, toluene, ethylbenzene, and xylenes (BTEX) using USEPA Method 5030/8020.
- The sludge within the sump was also analyzed for polychlorinated biphenyls (PCBs).

- Additional soil excavation was performed, and four initial confirmation samples were collected at 6 feet below ground surface (bgs) and were analyzed for TPH using USEPA Method 418.1.
- Supplemental excavation was conducted to 10 bgs, and four additional soil samples were collected.

Although TPH was present in the bottom of the excavation, safety considerations precluded further extending or deepening the excavation. High-pressure pipelines are present to the south and west of the excavation area, and the scrubber oil pump foundation and enclosed electrical conduits are present to the north. The electrical conduits prevented removal of the pump foundation. Increasing the depth of the excavation beyond 10 feet bgs was not possible due to the proximity of the high-pressure gas lines and pump foundation. Upon receipt of the closure certification report, the County of San Bernardino requested further delineation of the residual contamination (sidewall samples) and additional data for metals. The results of the additional sampling were submitted in an addendum to the closure certification report (Trident, 1996b).

To further assess the extent of the remaining contamination, platforms were constructed at the corners of the excavation to allow use of a hand sampling tool without having workers enter the excavation. The success of the hand sampling was limited by the very rocky soil encountered in the bottom of the excavation; soil samples were successfully obtained from four locations ranging from 10.4 to 11 feet bgs; at two locations, two soil samples were collected (Trident, 1996b). Although there was residual contamination, closure of the tank was proposed based on leaking underground fuel tank manual criteria, including low rainfall and depths to groundwater exceeding 100 feet, which lead to the conclusion that the residual contamination did not pose a threat. The conclusions presented in the closure certification report remained the same (Trident, 1996b).

On January 16, 1997, Ecology and Environment, Inc. (E&E) conducted a deeper soil investigation; the investigation report indicates that it was completed in accordance with the scope of work reviewed by the County of San Bernardino. Five borings were installed to a maximum depth of 40 feet bgs. Some of the borings had to be relocated slightly from their planned location due to the presence of underground utilities. Borings SS-1, SS-4, and SS-5 were terminated at 25 feet bgs. Boring SS-2 was terminated at 20 feet bgs, and Boring SS-3 was terminated at 40 feet bgs because there was no field evidence of hydrocarbons (odor, staining, or photoionization detector readings) at those depths. Hydrocarbon impacts to soil were present to approximately 35 feet bgs.

The results of this investigation indicated there was little lateral spreading of hydrocarbons, rather, they migrated vertically to 35 to 40 feet bgs. Consistent with the Trident reports, E&E reported that the sump and surrounding impacted soils were removed to 10 feet bgs and also indicated the excavation backfilled with clean material. E&E concluded that because the depth to groundwater is approximately 130 to 140 feet bgs, annual precipitation is very low, it is highly unlikely that remaining total recoverable petroleum hydrocarbons (TRPH) will migrate to groundwater. Therefore, no further action was recommended.

1.2 Conceptual Site Model

A graphical conceptual site model has been developed for AOC 26 based on the above site history and background, as shown in Figure B23-2. Table B23-1 presents primary sources, primary source media, potential release mechanisms, secondary source media, and potential secondary release mechanisms for AOC 26. (All tables and figures appear at the end of this subappendix.) A detailed discussion of the migration pathways, exposure media, exposure routes, and receptors is included in the *Soil Part B Data Quality Objectives Technical Memorandum, PG&E Topock Compressor Station Needles, California* (CH2M HILL, 2011).

The primary sources of contamination at AOC 26 are likely to be incidental spills or leakage at fittings during transfer of the accumulated pipeline liquids, as well as potential leaks through the bottom of the sump. The quantity of pipeline liquids released from the scrubber sump is unknown; however, as documented in the Trident and E&E reports, releases from the sump occurred because contamination was present in and below the excavation.

The primary source medium at AOC 26 is subsurface soil. Residual contamination is present to approximately 35 feet bgs, as discussed in Section 2.0 of this subappendix.

2.0 Summary of Past Soil Characterization

Sampling at AOC 26 included the soil stockpiled from the excavation and the sludge in the bottom of the sump, two sets of confirmation samples, and two rounds of sampling designed to further characterize residual contamination. Sample results for AOC 26 are included in Tables B23-2 and B23-3 and further discussed in this section. The historical data for AOC 26 are all Category 3 because laboratory quality control backup information was not included in the report.

The stockpile samples were analyzed for CAM 17 metals and eight toxicity characteristic leaching procedure (leachable) metals, TPH, and BTEX. In addition to these parameters, the sludge sample was also analyzed for PCBs. Arsenic, barium, total chromium, cobalt, copper, lead, molybdenum, nickel, vanadium, and zinc were detected in the CAM 17 metals analysis. None of the detected concentrations exceeded the commercial screening levels (California human health screening levels or USEPA regional screening levels for commercial/industrial use, as applicable). Total chromium, copper, lead, molybdenum, and zinc were detected at concentrations exceeding their respective background threshold values (BTVs). Total chromium was detected at a concentration of 139 milligrams/kilogram (mg/kg) compared to the BTV of 39.8 mg/kg, lead was detected at concentration of 81 mg/kg compared to a BTV of 8.39 mg/kg, and molybdenum was detected at a concentration of 12 mg/kg compared to a BTV of 1.37 mg/kg. Copper (19 mg/kg) and zinc (64 mg/kg) only barely exceeded their BTVs (16.8 mg/kg, and 58 mg/kg, respectively. Barium was the only soluble metal detected; it was detected a concentration of 1.8 milligrams per liter (mg/L) compared to the toxicity characteristic leaching procedure limit of 100 mg/L. Soluble arsenic, cadmium, total chromium, lead, mercury, selenium, and silver were all nondetect at detection limits ranging from 0.02 mg/L (mercury) to 0.5 mg/L (lead).

Only low concentrations of BTEX compounds were detected. Benzene was detected at 0.008 mg/kg, ethylbenzene was detected at 0.04 mg/kg, toluene was detected at 0.17 mg/kg, and total xylenes were detected at 0.52 mg/kg. TPH-gasoline was detected at

12 mg/kg, and TPH-diesel was detected at 2,500 mg/kg. The laboratory data reports for the sludge sample are not available; the text of the report indicates that PCBs were nondetect; the detection limit was not provided (Trident, 1996a).

At the request of San Bernardino County, the stockpiled soils were subsequently analyzed for soluble hexavalent chromium, total chromium, and lead using the Waste Extraction Test. Soluble hexavalent chromium was nondetect; soluble total chromium and soluble lead were detected at concentrations of 1.3 mg/L, and 0.63 mg/L, respectively, which are well below the applicable soluble threshold limit concentrations of 560 mg/L and 5 mg/L, respectively. A fish bioassay was also conducted. The soil sample passed the fish bioassay (Trident, 1996b).

Based on the results of the soil stockpile and sludge testing, which concluded that "oil" (that is TPH) was the only constituent of concern, confirmation samples were consequently analyzed for TRPH only (using USEPA Method 418.1). The test results from the initial round of confirmation sampling indicated that TRPH concentrations in the four samples ranged from 8,400 mg/kg to 15,000 mg/kg, and additional excavation was performed to 10 feet bgs. Four additional confirmation samples were collected; TRPH concentrations ranged from 2,000 mg/kg to 12,000 mg/kg.

As discussed in Section 1.1 of this subappendix, because further excavation would not have been safe, an attempt was then made to characterize the remaining contamination; however, the rocky soil greatly limited the depth that could be achieved for these supplemental samples. Samples from the southern portion of the excavation were collected at 10.5 (two locations), 10.8, and 11.0 feet bgs. These samples contained TRPH at 1,300 mg/kg (SS-SW-Comp, a composite sample), 780 mg/kg (SS-SE-10.5), 570 mg/kg (SS-SE-10.8), and 400 mg/kg (SS-S-11.0), respectively. Only three samples (SS-NW-10.0, SS-N-10.4 and SS-NE-10) were obtained from the northern side of the excavation at 10.0 and 10.5 feet bgs. These three samples contained TRPH concentrations of 3,700 mg/kg (SS-N-10.4) and 15,000 mg/kg (SS-NE), and 15,000 mg/kg (SS-MW-10.0). There was no visible discoloration of the soil.

At the request of San Bernardino County, additional sidewall sampling was performed. Four sidewall samples (SSWN, SSWE, SSWS, and SSWW) were collected and analyzed for TRPH. The TRPH results were 3,700 mg/kg (SSWN), 1,800 mg/kg (SSWE), 3,100 mg/kg (SSWS), and 9,100 mg/kg (SSWW). Also at the request of the County, metals analyses were performed on the three high-TRPH concentration samples from the bottom and sidewalls of the excavation. The analyses were performed on samples SS-NE-10 and SS-NE-10.5 from the bottom of the excavation and from SS-WW (collected at 8 feet bgs from the sidewall of the excavation). TRPH concentrations in these samples ranged from 6,700 mg/kg to 15,000 mg/kg. The samples were analyzed for total chromium, lead, and hexavalent chromium. Hexavalent chromium was nondetect in all three samples, and total chromium concentrations ranged from 14 to 22 mg/kg (all below the BTV of 39.8 mg/kg). The samples with the highest detected TRPH concentration (SS-NE-10.5) also contained a detectable concentration of lead (12 mg/kg). The detected lead concentration slightly exceeded the BTV for lead (8.39 mg/kg).

The E&E investigation included five borings, sampled every 5 feet. Twenty samples were collected and submitted for analysis for TRPH using USEPA Method 418.1. Detection limits ranged from 20 to 23 mg/kg. Borings SS-2 and SS-3 were installed within the footprint of the excavation. Borings SS-1, SS-4, and SS-5 were installed in the vicinity of the excavation. No hydrocarbons were detected in borings SS-4 and SS-5, located northeast and southwest of the former scrubber sump, respectively. The concentrations in SS-1 ranged from 29 to 78 mg/kg; the deepest sample (from 20 feet bgs) had a concentration of 38 mg/kg. Boring SS-2, located in the southern third of the former excavation, showed elevated concentrations of TRPH in the samples collected at 15 feet and 20 feet bgs (8,600 and 8,800 mg/kg, respectively); no samples were collected below 20 feet bgs from this boring. Elevated concentrations of TPH were detected between 20 feet and 35 feet bgs at Boring SS-3. Concentrations in these samples ranged from 2,800 to 9,700 mg/kg. TRPH was nondetect (< 22 mg/kg) in the sample collected at 40 feet bgs.

3.0 AOC 26 Nature and Extent Data Gaps Evaluation

The following subsection discusses the nature and extent of detected chemicals of potential concern (COPCs) and chemicals of potential ecological concern detected above screening levels at AOC 26. Multiple factors were considered to assess whether the nature and extent of a specific chemical has been adequately delineated. Section 4.0 of this subappendix provides the recommended sampling for this unit.

Based on the site history, background, and conceptual site model, review of the historical data indicates that elevated levels of TPH are present in the subsurface below between approximately 15 to 35 feet bgs. The lateral extent of the deeper TRPH concentrations has not been fully defined. However, it appears that residual contamination is limited to the immediate vicinity of the former scrubber sump because no TRPH was detected in borings SS-4 and SS-5, and only very low concentrations were detected in SS-1, located approximately 16 feet south of SS-1. In addition, the vertical extent of contamination at boring SS-2 has not been defined.

Metals data from the excavation are limited to analysis of hexavalent chromium, total chromium, and lead in three soil samples collected at two locations (SS-NE-10, SS-NE-10.5, and SSWW).

DTSC has also indicated that it considers the lack of volatile organic compound (VOC), polycyclic aromatic hydrocarbons (PAH), semivolatile organic compound (SVOC), and PCB data from actual boring samples (as opposed to stockpile samples) a data gap. Finally, although it was characterized as clean, native backfill (E&E, 1997), the precise source of the backfill for the excavation is unknown.

4.0 AOC 26 Data Gaps and Proposed Sampling

4.1 AOC 26 Data Gaps

Based on the Part B data quality objectives, data gaps were identified for Decision 1:

- Data Gap #1 - Vertical and lateral extents of contamination beneath and immediately adjacent to the former excavation
- Data Gap #2 – Quality of the backfill in the former excavation

Data gaps for Decisions 2 through 5 are discussed in the main text of Appendix B and include:

- **Decision 2:** In general, with the exception of PAHs in shallow soil, existing data are adequate to support exposure point concentration development for detected chemicals that exceeded one or more comparison values. However, since SVOC analysis, which includes PAHs, has been added to most soil samples collected within the fence line, this data gap has been addressed.
- **Decision 3:** Nature and extent (Decision 1) must be defined to fully assess Decision 3. Insufficient information is available to calculate soil screening levels protective of groundwater and to support screening-level groundwater modeling results, where necessary.
- **Decision 4:** Insufficient information is available to characterize the potential migration pathways from the vicinity of the former scrubber sump to areas outside the fence line. Data are required to characterize surface soils in this area.
- **Decision 5:** Various types of data will be needed to support the evaluation of technologies/remedial actions for the corrective measures study/feasibility study and potential interim measures, including soil physical parameters, constituent leachability data and, if remediation is required, waste characterization information and more detailed information on subsurface obstructions.

The proposed sample design is discussed in Section 4.3 of this subappendix.

4.2 AOC 26 Access Constraints

As discussed in Section 3.0 of Appendix B, there are substantial access constraints within the compressor station. AOC 26 is located in Area 2 on Figure B-3, Topock Compressor Station Accessibility Map, in the main text of Appendix B. All proposed sample locations are located within unpaved areas. Sample location AOC26-1 is likely to be accessible by hydrovac and is expected to be accessible by drill rig; all remaining locations, except AOC26-5, are likely accessible by hydrovac. Table B23-4 provides an accessibility assessment for the proposed AOC 23 sampling location. One hundred and thirty-four utility risers, including main gas, gas, electrical, odorant, and water lines, were identified in Area 2. In addition, this area contains an emergency shutoff device, five vaults, a control panel, a utility trench, and a pipe coming from the upper yard. Photographs 57 through 59 in Appendix B26 show the accessibility constraints in AOC 26. Sample locations and depths identified for AOC 26 reflect the identified access constraints and the phased sampling approach described in Section 4.0 of Appendix B.

4.3 AOC 26 Proposed Sampling

Table B23-4 summarizes the proposed AOC 26 sample locations, depths, description/ rationale for each location (that is, the data gaps they would address), and analytes. Proposed sample locations are also shown in Figure B23-1. The proposed AOC 26 sample locations were defined in collaboration with DTSC and the United States Department of the Interior. At the direction of DTSC, a multi-depth soil gas vapor sampling probe will be installed in the former sump area within the boundary of AOC 26 at 5 feet bgs (near the surface), 25 feet bgs (near the depth of contamination), and 50 feet bgs (below the depth of contamination). Two rounds (summer and winter) of soil gas samples will be collected from the three depth intervals and will be analyzed for VOCs. Soil vapor probe installation and soil vapor sampling will be performed as described in Section 2.0 of the main text of the Soil RFI/RI Work Plan and in Standard Operating Procedures #17 and #18 in Appendix G to the Soil RFI/RI Work Plan. During the installation of the multi-depth soil vapor probe at sample location AOC26-1, soil samples will be collected at the 0 to 0.5, 2 to 3, 5 to 6, 9 to 10, 24 to 25, 49 to 50, and 74 to 75 feet bgs depth intervals.

Based on the available information, COPCs for this unit associated with releases from the scrubber sump consist of metals and TPH. Samples from this area will be analyzed for Title 22 metals, hexavalent chromium, VOCs, TPH, SVOCs, PAHs, PCBs, and pH. Samples will be collected at five locations; AOC 26-1 will be collected at multiple depths down to 75 feet bgs, as discussed above. The remaining sample locations (AOC26-2 through AOC26-5) in this unit will initially be sampled at the surface (0 to 1 foot bgs), 2 to 3, 5 to 6, and 9 to 10 feet bgs. Proposed samples for nearby AOCs will also be used to characterize soil for this unit, as shown on Figure B23-1. Ten percent of all samples from the investigation will also be analyzed for the full suite of Target Analyte List/Target Compound List constituents.

To address the data needs associated with Decision 5, one sample will also be analyzed for soil characteristics, including grain size, washes (P200 sieve), Atterberg limits, and gradation. The sample has been tentatively identified in Table B23-4); the specific sample to be analyzed for these parameters will be confirmed in the field. Data will be reviewed and evaluated as described in the main text of Appendix B. In addition, to address potential concerns associated with leaching of COPCs to groundwater, select samples may be analyzed for soluble total chromium and hexavalent chromium using the SW1312 synthetic precipitation leaching procedure. Samples will be analyzed by synthetic precipitation leaching procedure only after initial sample results have been received, evaluated, and compared against the soil screening levels developed for Decision 3.

5.0 References

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Pacific Gas and Electric Company (PG&E). 1951. Engineering Drawing No. 382914, Revision 1: *Scrubber Oil Sump, Topock Compressor Station*. March 3.

__________. 1994. Engineering Drawing No. 481766, Revision 21: *Piping Plan at Scrubber (Typical) and Oil Sump – Area No. 2, Topock Compressor Station*. August 26.

Trident Environmental Consultants (Trident). 1996a. *Scrubber Sump Closure Certification Report, PG&E Topock Compressor Station, Needles, California*. August 26.

__________. 1996b. *Addendum No. 1 to Scrubber Sump Closure Certification Report, PG&E Topock Compressor Station, Needles, California*. October 10.

Tables

TABLE B23-1
Conceptual Site Model – AOC 26 Former Scrubber Oil Sump
Soil Investigation Part B Work Plan,
PG&E Topock Compressor Station, Needles, California

Primary Source	Primary Source Media	Potential Release Mechanism	Secondary Source Media	Potential Secondary Release Mechanism
Potential incidental Spills/ Releases from former sump	Surface Soil	Percolation and/or infiltration	Surface Soil	Wind erosion and atmospheric dispersion of surface soil
			Shallow Soil	Potential volatilization and atmospheric dispersion
				Potential extracted groundwater[a]

Notes:

[a] Quantitative evaluation of the groundwater pathway was completed in the groundwater risk assessment (ARCADIS, 2009); Part B data will be reviewed in the data gaps assessment to evaluate potential fate impacts or current localized impacts to groundwater from soil.

TABLE B23-2

Sample Results: Metals

Area of Concern 26 – Former Scrubber Oil Sump

Soil Investigation Part B Work Plan

Pacific Gas and Electric Company Topock Compressor Station Needles, California

				Metals (mg/kg)		
Commercial Screening Level [1]:				**37**	**NE**	**320**
RWQCB Environmental Screening Level [2]:				**NE**	**NE**	**NE**
Background [3]:				**0.83**	**NE**	**8.39**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Chromium Hexavalent**	**Chromium**	**Lead**
Category3						
SS-NE	09/05/96	10	N	ND (1)	22	ND (5)
	09/05/96	10.5	N	ND (1)	14	**12**
SSWW	09/05/96	8	N	ND (1)	15	ND (5)

Notes:

1 Commercial screening level - commercial DTSC CHHSL. If the commercial DTSC CHHSL is not established, the USEPA regional screening level is used.

2 RWQCB. 2008. "Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater" (Table K-1). May 27.

3 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

4 Commercial screening level is below background value; therefore, arsenic results are only screened against the background value.

Results greater than or equal to the Background value are bolded. Results greater than or equal to the Commercial Screening level or RWQCB ESL are circled.

NE = not established

USEPA = United States Environmental Protection Agency

DTSC = California Department of Toxic Substances Control

RWQCB = California Regional Water Quality Control Board

CHHSL = California human health screening levels

-- = not analyzed

FD = Field Duplicate

ft bgs = feet below ground surface

J = concentration or reporting limit estimated by laboratory or data validation

mg/kg = milligrams per kilogram

N = Primary Sample

ND = not detected at the listed reporting limit

TABLE B23-3

Sample Results: Total Petroleum Hydrocarbons

Area of Concern 26 – Former Scrubber Oil Sump

Soil Investigation Part B Work Plan

Pacific Gas and Electric Company Topock Compressor Station Needles, California

				Total Petroleum Hydrocarbons (mg/kg)	
			Commercial Screening Level [1]:	NE	NE
			RWQCB Environmental Screening Level [2]:	NE	NE
			Background [3]:	NE	NE
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**Total Petroleum Hydrocarbons**	**Total Recoverable Hydrocarbons**
Category3					
SS1	01/16/97	5	N	---	78
	01/16/97	13	N	---	45
	01/16/97	15	N	---	29
	01/16/97	20	N	---	38
SS2	01/16/97	15	N	---	8,600
	01/16/97	20	N	---	8,800
SS3	01/16/97	15	N	---	390
	01/16/97	20	N	---	2,800
	01/16/97	27	N	---	9,700
	01/16/97	30	N	---	8,200
	01/16/97	35	N	---	8,100
	01/16/97	40	N	---	ND (22)
SS4	01/16/97	5	N	---	ND (21)
	01/16/97	10	N	---	ND (23)
	01/16/97	15	N	---	ND (21)
	01/16/97	20	N	---	ND (22)
SS5	01/16/97	5	N	---	ND (21)
	01/16/97	10	N	---	ND (21)
	01/16/97	15	N	---	ND (20)
	01/16/97	20	N	---	ND (22)
SS-N-10.4	09/05/96	10.4	N	3,700	---
SS-NE	09/05/96	10	N	6,700	---
	09/05/96	10.5	N	15,000	---
SS-NW-10.0	09/05/96	10	N	5,700	---
SS-S-11.0	09/05/96	11	N	400	---
SS-SE-10.5	09/05/96	10.5	N	780	---
SS-SE-10.8	09/05/96	10.8	N	570	---
SS-SW-Comp	09/05/96	10.5	N	1,300	---
SSWE	09/05/96	9	N	1,800	---
SSWN	09/05/96	9	N	3,700	---
SSWS	09/05/96	8.5	N	3,100	---
SSWW	09/05/96	8	N	9,100	---

TABLE B23-4
Proposed Sampling Plan, AOC 26 – Former Scrubber Oil Sump
Soil Investigation Part B Work Plan,
PG&E Topock Compressor Station, Needles, California

Location	Depths (feet)	Description/Rationale	Analytes	Accessibility Assessment
AOC26-1[a]	0 to 05, 2 to 3, 5 to 6, 9 to 10, 24 to25, 49 to 50, and 74 to 75	To resolve Data Gaps #1 and #2, vertical and lateral extents of contamination beneath and immediately adjacent to the former excavation and assess quality of the backfill in the former excavation	Title 22 metals, hexavalent chromium, VOCs, TPH, SVOCs, PAHs, PCBs, and pH; also will be analyzed for soil characteristics, including grain size, washes (P200 sieve), Atterberg limits, and gradation.	Suitable for XRF Likely accessible by hydrovac Likely accessible by small drilling rig
AOC26-2	0 to 05, 2 to 3, 5 to 6, 9 to 10, if feasible	To resolve Data Gaps #1, vertical and lateral extents of contamination beneath and immediately adjacent to the former excavation	Title 22 metals, hexavalent chromium, VOCs, TPH, SVOCs, PAHs, PCBs, and pH	Suitable for XRF Likely accessible by hydrovac Likely accessible by small drilling rig
AOC26-3	0 to 05, 2 to 3, 5 to 6, 9 to 10, if feasible	To resolve Data Gaps #1, vertical and lateral extents of contamination beneath and immediately adjacent to the former excavation	Title 22 metals, hexavalent chromium, VOCs, TPH, SVOCs, PAHs, PCBs, and pH	Suitable for XRF Likely accessible by hydrovac Likely accessible by small drilling rig
AOC26-4	0 to 05, 2 to 3, 5 to 6, 9 to 10, if feasible	To resolve Data Gaps #1, vertical and lateral extents of contamination beneath and immediately adjacent to the former excavation	Title 22 metals, hexavalent chromium, VOCs, TPH, SVOCs, PAHs, PCBs, and pH	Suitable for XRF Likely accessible by hydrovac Likely accessible by small drilling rig
AOC26-5	0 to 05, 2 to 3, 5 to 6, 9 to 10, if feasible	To resolve Data Gaps #1, vertical and lateral extents of contamination beneath and immediately adjacent to the former excavation	Title 22 metals, hexavalent chromium, VOCs, TPH, SVOCs, PAHs, PCBs, and pH	Suitable for XRF Likely accessible by hydrovac Likely accessible by small drilling rig

Note:

[a] A multi-depth soil gas vapor sampling probe will be installed at this location at 5, 25, and 50 feet bgs. One round of soil gas samples will be collected from the three depth intervals and analyzed for VOCs.

Ten percent of samples from the investigation will be analyzed for Target Analyte List/Target Compound List constituents.

VOC analysis will not be conducted on surface soil samples (0 to 0.5 foot bgs).

Figures

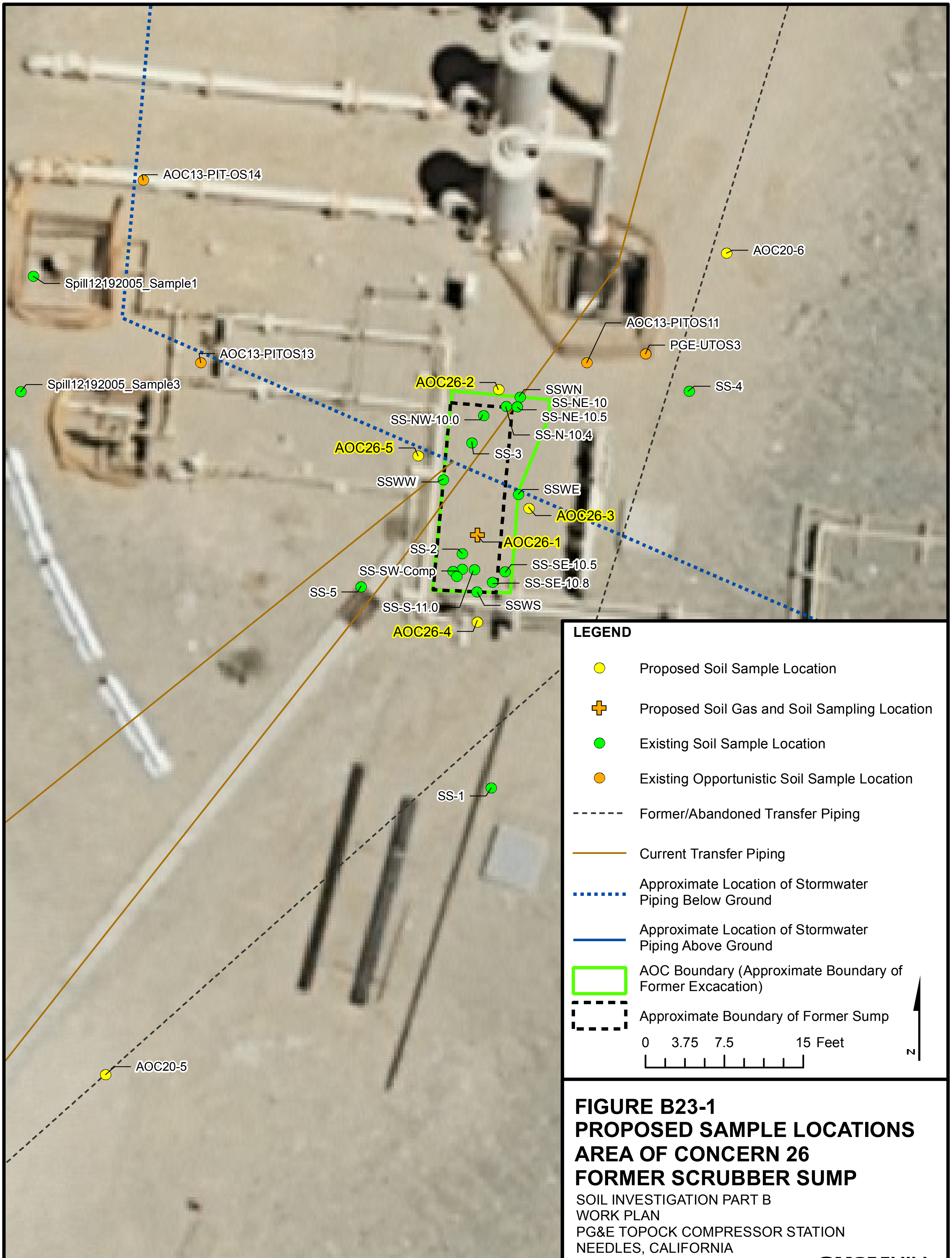

FIGURE B23-1
PROPOSED SAMPLE LOCATIONS
AREA OF CONCERN 26
FORMER SCRUBBER SUMP

SOIL INVESTIGATION PART B
WORK PLAN
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

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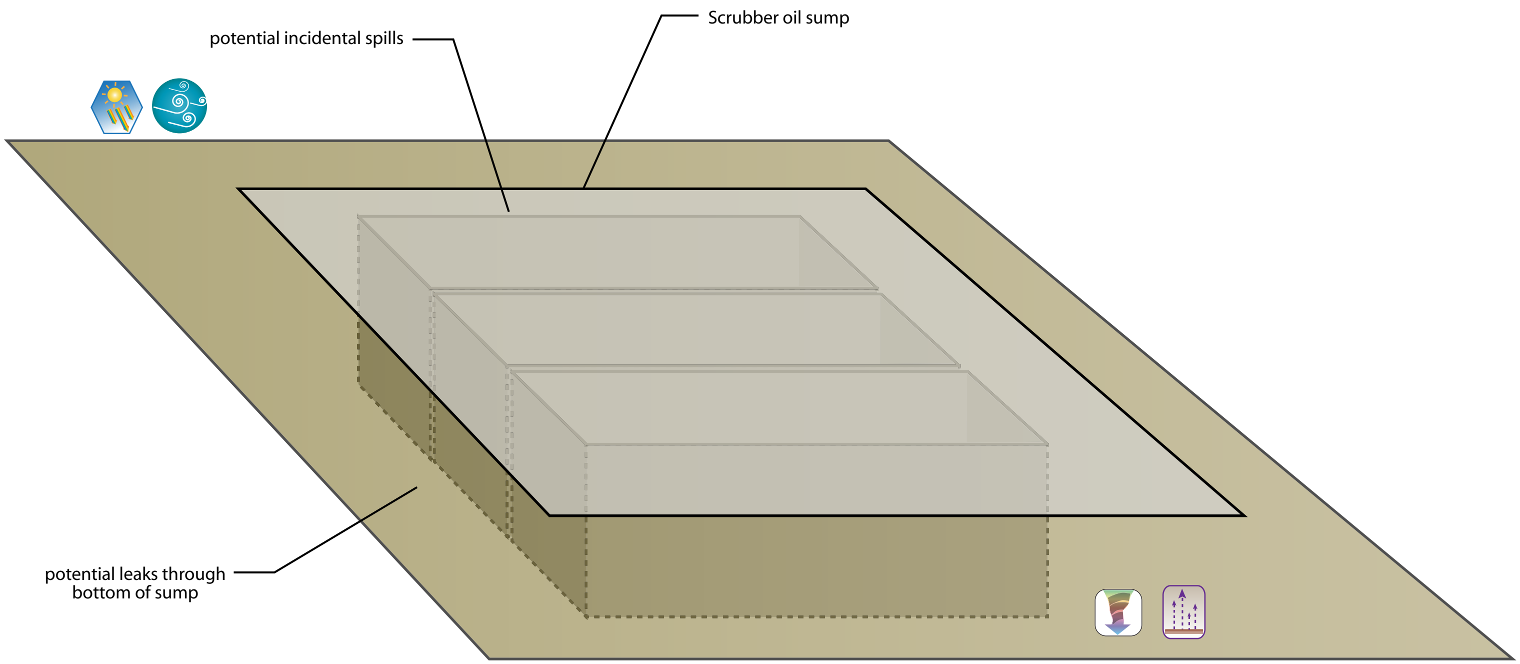

NOT TO SCALE

LEGEND

Potential Release Mechanisms

- Windblown Dispersion
- Volatilization
- Degradation by Heat/Light
- Infiltration

FIGURE B23-2
Conceptual Site Model for AOC26
Former Scrubber Sump
Soil Investigation Part B Work Plan
PG&E Topock Compressor Station
Needles, California

CH2MHILL

AppendixB24
AOC 32 – Oil Storage Tank Area and Waste Sump Investigation Program

Contents

Acronyms and Abbreviations

AOC	Area of Concern
bgs	below ground surface
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
SVOC	semivolatile organic compound
TPH	total petroleum hydrocarbons
Trident	Trident Environmental and Engineering
VOC	volatile organic compound

SUBAPPENDIX B24

AOC 32 Investigation Program

1.0 Introduction and Background

1.1 Background

AOC 32 is the oil storage tank area (which also contains the waste-oil sump) in the upper yard immediately west of the visitor parking lot. This is an active unit. AOC 32 contains five 7,150-gallon-capacity oil storage tanks, the waste-oil sump, and two 150-gallon-capacity lubricating-oil surge tanks (Pacific Gas and Electric Company, 1952). The oil storage tanks and waste-oil sump are part of the original compressor station installation. Four of the five storage tanks contain clean (makeup) oil for the main compressor engines and generator engines. The fifth tank contains waste oil that is removed regularly by a contractor. The tanks and sump are located within a concrete containment structure. The bottom of the containment structure is located approximately 16 inches below the surrounding grade, and the sides of the containment structure are approximately 5 to 8 inches above the surrounding grade. The bottom of the pipe trench located in the containment structure, along the eastern side, is approximately 1 foot below the bottom of the main portion of the containment structure. The sidewalls of the containment structure are apparent in a station photograph taken between 1954 and 1958; however, it is uncertain if the oil storage area has always had a paved floor. It appears from the same photo that the tanks were mounted on foundations; currently the bottoms of the tanks appear to be set level with the floor of the containment.

Associated piping is also located within the containment. The containment structure appears to be in good repair and also appeared to be in good condition during an inspection in 1994. In 1994, a registered civil engineer evaluated the condition of the concrete containment for the oil storage tanks and rated it as being in good to excellent condition, suitable for use as secondary containment. Minor surface cracks were determined to be unlikely to penetrate the concrete. Therefore, the letter concludes that it would be unlikely that an oil spill would penetrate through the containment (Trident, 1996).

The waste-oil sump receives waste oil from the oil/water separator, pipeline liquids collected from the scrubbers, and formerly received used oil from the scrubber sump. The waste-oil sump consists of a steel tank within a concrete liner; the steel tank was installed into the existing waste-oil sump in 1996 (Trident, 1996). Prior to the installation of the steel liner in 1996, the waste-oil sump was emptied and cleaned, and the concrete structure was inspected by a registered civil engineer. The concrete was found to be in good condition, with no cracks in the surface of the concrete and no erosion, pitting, or spalling of the concrete, and the condition of the concrete around the pipe penetrations was sound. The concrete tank was determined to be suitable as secondary containment for the new steel tank (Trident, 1996).

A catch basin is located in the southeast corner of the secondary containment structure. This catch basin is piped to the sump in the pipe trench south of the oil storage tank area. The sump in the pipe trench discharges to the oily water treatment system. In addition, a pipe connection exists from the catch basin to the storm drain line in the area. The valve leading to the storm drain line is closed and locked (chained) shut.

1.2 Conceptual Site Model

A graphical conceptual site model has been developed for AOC 32 based on the above site history and background, as shown in Figure B24-1. (All tables and figures appear at the end of this subappendix.) Table B24-1 presents primary sources, primary source media, potential release mechanisms, secondary source media, and potential secondary release mechanisms for AOC 32. A detailed discussion of the migration pathways, exposure media, exposure routes, and receptors is included in the *Soil Part B Data Quality Objectives Technical Memorandum, PG&E Topock Compressor Station Needles, California* (CH2M HILL, 2011).

The primary sources of contamination at AOC 32 are likely to be incidental releases of new and waste oil stored in this area. The potential type and quantity any oil released in the vicinity this AOC are unknown. The primary source medium at AOC 32 appears to be concrete or asphalt (if releases occurred to outside the secondary containment). If the bottom of the unit was unpaved or if releases occurred outside the secondary containment in earlier times, surface soil could also have been a primary source medium. Oil released in AOC 32 would have been released primarily to concrete, and if the concrete lacked integrity, could have been released to surface soils underlying the concrete.

Any oil that entered surface soil could have infiltrated shallow soil. Oils released to shallow soils could have infiltrated to deeper soils. If surface soil was previously exposed within this area, organic constituents in surface soils could have been degraded by heat and light. Because this unit is now entirely covered with concrete and located within secondary containment, surface soil runoff and wind dispersion are not potential migration pathways.

2.0 Summary of Past Soil Characterization

There are no current data in the immediate vicinity of AOC 32.

3.0 AOC 32 Nature and Extent Data Gaps Evaluation

This AOC has not been previously sampled.

4.0 AOC 32 Data Gaps and Proposed Sampling

4.1 AOC 32 Data Gaps

Based on the site conceptual model and Part B data quality objectives, the following data gap was identified for Decision 1, as follows:

- Data Gap #1 – Lateral and vertical extents of contamination underneath and immediately adjacent to concrete containment structure

Data gaps for Decisions 2 through 5 are discussed in Appendix B and include the following:

- **Decision 2:** In general, with the exception of polycyclic aromatic hydrocarbons (PAHs) in shallow soil, existing data are adequate to support exposure point concentration development for detected chemicals that exceeded one or more comparison values. However, since semivolatile organic compound (SVOC) analysis, which includes PAHs, has been added to most soil samples collected within the fence line, this data gap has been addressed.

- **Decision 3:** Nature and extent (Decision 1) must be defined to fully assess Decision 3. Insufficient information is available to calculate soil screening levels protective of groundwater and to support screening-level groundwater modeling results, where necessary.
- **Decision 4:** For AOC 32, sufficient information is available to characterize the potential current migration pathways from the unit to areas outside the fence line. Due to the nature of the unit, no further characterization of potential migration pathways is required.
- **Decision 5:** Various types of data will be needed to support the evaluation of technologies/remedial actions for the corrective measures study/feasibility study and potential interim measures, including soil physical parameters, constituent leachability data and, if remediation is required, waste characterization information and more detailed information on subsurface obstructions.

The proposed sample design is discussed in Section 4.3 of this subappendix.

4.2 AOC 32 Access Constraints

As discussed in Section 3.0 and Figure B-3 in Appendix B, there are substantial access constraints within the compressor station. AOC 32 is located in Area 11 on Figure B-2, Topock Accessibility Map, in the main text of Appendix B. The AOC 32 boundary is located within an active, concrete-paved unit at the compressor station, making all areas within the AOC boundary inaccessible at this time. Thirty-two utility risers, consisting of wastewater, water, and electrical lines, were identified in Area 11. Photographs 64 to 66 in Appendix B26 show the accessibility constraints in AOC 32.

4.3 AOC 32 Proposed Sampling

No samples are proposed for AOC 32 because this is an active unit, and sampling the unit is not possible without comprising the integrity of the secondary containment. Samples from nearby units will be used to characterize AOC 32. During the April 10, 2012 meeting, sample location AOC13-16 was moved closer to the waste-oil sump in AOC 32, and a soil gas sample will also be collected from this location. A soil gas sampling probe will be installed at a minimum of 4 feet below ground surface (bgs) and will be analyzed for volatile organic compound (VOC). The soil gas sampling probe will be installed and sampled in accordance with the soil gas methodology described in Section 2.0 of the main text of this work plan. Figure B24-2 shows proposed sample locations for surrounding solid waste management units and AOCs. The proposed soil and soil gas sample locations that will be used to characterize AOC 32 were defined in collaboration with the California Environmental Protection Agency, Department of Toxic Substances Control and the United States Department of the Interior and will be optimized and sampled in accordance with the phased sampling approach outlined in Section 4.0 of Appendix B.

Samples from AOC 13-16 will be analyzed for Title 22 metals, hexavalent chromium, VOCs, total petroleum hydrocarbons (TPH), SVOCs, polychlorinated biphenyls (PCBs), PAHs, asbestos, and dioxin and furans. Ten percent of all samples collected during the soil investigation will also be analyzed for the full suite of Target Analyte List/Target Compound List constituents. Proposed samples for nearby AOCs will also be used to characterize soil for this unit, as shown on Figure B24-2.

To address the data needs associated with Decision 5, samples from near-by units will be analyzed for soil characteristics, including grain size, washes (P200 sieve), Atterberg limits, and gradation.

5.0 References

CH2M HILL. 2011. *Soil Part B Data Quality Objectives Technical Memorandum, PG&E Topock Compressor Station Needles, California*. February.

Pacific Gas and Electric Company. 1952. GM 113785: *Topock Compressor Station Post Construction Summary*.

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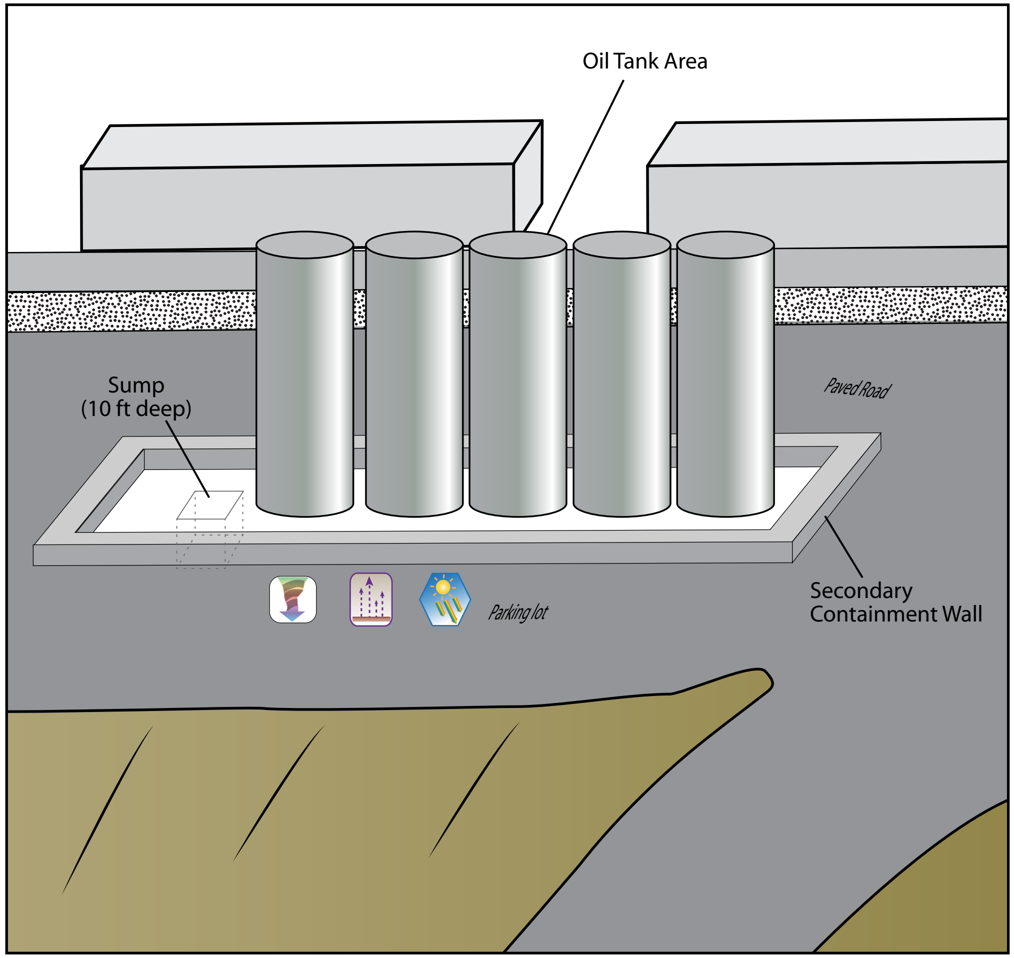
Tables

TABLE B24-1
Conceptual Site Model, AOC – 32 Oil Storage Tank Area and Waste Oil Sump
Soil Investigation Part B Work Plan
PG&E Topock Compressor Station, Needles, California

Primary Source	Primary Source Media	Potential Release Mechanism	Secondary Source Media	Potential Secondary Release Mechanism
Incidental Spills and Releases from new or waste oil tanks, or waste oil sump	Concrete, Surface Soil[a]	Infiltration	Surface Soil, Shallow Soil	Potential release to deeper soil

[a] Surface soil if the bottom of the oil storage tank farm was formerly unpaved.

Figures



NOT TO SCALE

LEGEND

Potential Release Mechanisms

Infiltration

Volatilization

Degradation by Heat/Light

FIGURE B24-1
Conceptual Site Model for AOC32
Oil Storage Tank and Waste Oil Sump
Soil Investigation Part B Work Plan
PG&E Topock Compressor Station
Needles, California

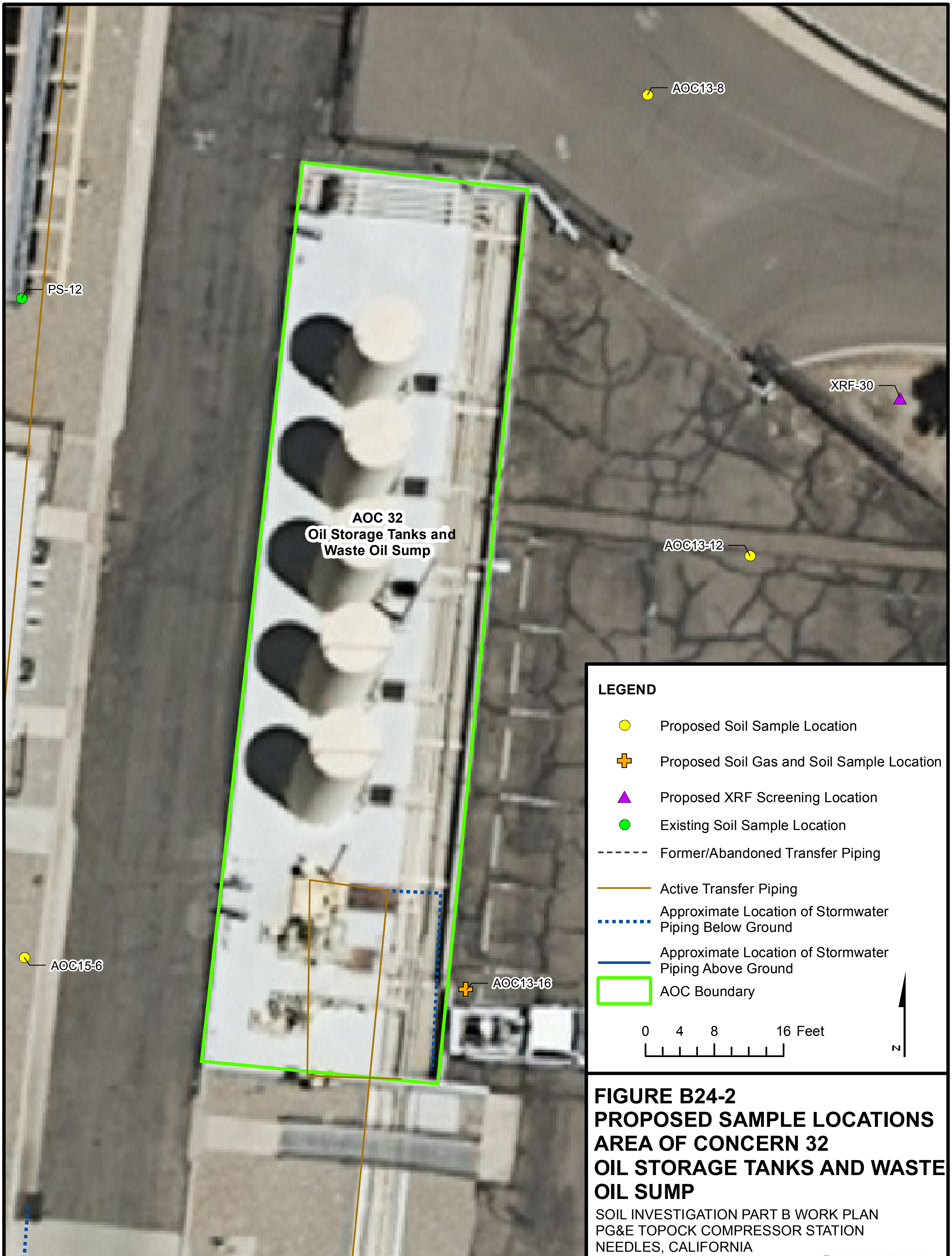


FIGURE B24-2
PROPOSED SAMPLE LOCATIONS AREA OF CONCERN 32 OIL STORAGE TANKS AND WASTE OIL SUMP

SOIL INVESTIGATION PART B WORK PLAN
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\SWP_B\AOC32\AOC32_Proposed_Sample_Locs.mxd Date Saved: 8/30/2012 9:31:30 AM

Subappendix B25
Units 4.3 through 4.5 – Oily Water Holding Tank (Unit 4.3), Oil/Water Separator (Unit 4.4), and Portable Waste Oil Holding Tank (Unit 4.5) Investigation Program

Contents

Acronyms and Abbreviations

AOC	Area of Concern
bgs	below ground surface
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
mg/kg	milligrams per kilogram
OWS	oil/water separator
OWTS	oily water treatment system
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PG&E	Pacific Gas and Electric Company
RFA	*RCRA Facility Assessment, Pacific Gas and Electric Company, Topock Compressor Station, Needles, California*
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
TPH	total petroleum hydrocarbons
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound

SUBAPPENDIX B25

Units 4.3, 4.4, and 4.5 Investigation Program

1.0 Introduction and Background

The former oily water treatment system (OWTS) consisted of the Oil/Water Holding Tank (Unit 4.3), the Oil/Water Separator (OWS) (Unit 4.4), the Portable Waste Oil storage Tank (Unit 4.5), and the interconnecting piping located in the southern portion of the lower yard, as shown in Figures B25-1, and B25-2. The OWTS was located immediately adjacent to Sludge Drying Bed 1 (eastern bed). The old OWTS was apparently constructed between approximately 1967, when the oil/water separator was relocated to the sludge drying beds, and 1970, when the construction of the two-step wastewater treatment system, which was directly connected to the OWTS, was completed (Pacific Gas and Electric Company [PG&E], 1968, 1970a). Closure of these facilities was performed between November 1989 through March 1990 in general accordance with the *Work Plan for Removal of the Oil Water Separator System, Topock Compressor Station* (Mittelhauser, 1989). The former OWS was located slightly west of the current system, shown on Figure B25-1. (All tables and figures appear at the end of this subappendix.)

1.1 Unit 4.3 Former Oil/Water Holding Tank

The Oil/Water Holding Tank was identified by the United States Environmental Protection Agency (USEPA) in the *RCRA Facility Assessment, Pacific Gas and Electric Company, Topock Compressor Station, Needles, California* (RFA) (Kearny, 1987) but was not subsequently designated as a Solid Waste Management Unit (SWMU) or Area of Concern (AOC) by the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). The Oil/Water Holding Tank was reported to have been installed in 1970 (Kearny, 1987), and it is shown on a 1970 as-built drawing (PG&E, 1970a). It consisted of a cylindrical steel tank about 15 feet long and 5 feet in diameter with a capacity of 3,000 gallons. The tank was mounted horizontally on two concrete supports; the area beneath the tank and around the OWTS was unpaved.

The Oil/Water Holding Tank was used to collect oily water from the compressor floor drainage (about 200,000 gallons per year), compressor engine cleaning operations (about 10,000 gallons per year), and steam-cleaning operations (about 10,000 gallons per year) (Kearny, 1987). In general, all oily water was discharged to the oily water system, as is the case today (Russell, 2006). Wastewater that was collected in this tank was discharged by gravity flow via an aboveground 3-inch-diameter steel pipe to the adjacent Unit 4.4.

Chemical analysis data for wastewater processed through the Oil/Water Holding Tank indicate that the wastewater contained up to 48 milligrams per liter oil and grease (Brown and Caldwell, 1986). Detectable concentrations of some metals, including total chromium, were also present in the wastewater. No indication of a release was observed during a facility inspection performed as part of the RFA (Kearny, 1987).

The Oil/Water Holding Tank was removed in conjunction with the sludge drying beds (SWMU 5) between November 1988 and February 1989 (Mittelhauser, 1990a). The steps taken during closure of the Oil/Water Holding Tank included:

- Hydroblasting of the steel tank; the hydroblast water was containerized and disposed of as hazardous waste.
- Removal of the tank from its foundation.
- Demolition of the tank due to the presence of oily sludge deposits in the tank that could not be removed; the tank was disposed of as hazardous waste.
- Removal of the concrete foundation; the tank foundation was not visibly contaminated and was therefore used as fill at the station.

Soils beneath the tank and concrete foundation were inspected and found not to be visibly contaminated; therefore, no confirmation samples were collected from this area.

1.2 Unit 4.4 Former Oil/Water Separator

The former OWS was identified by the USEPA in the RFA (Kearny, 1987) but was not subsequently designated as a SWMU or AOC by DTSC. The former OWS was part of the former oily water treatment system and was located adjacent to the Oil/Water Holding Tank (Unit 4.3) in the southern portion of the lower yard, as shown on Figure B25-1. The OWS was the same API oil/water separator formerly located at AOC 24. GM 488606-R indicates that the installation of a jacket water drain system required the OWS to be relocated to the sludge drying area for proper gravity drainage of the jacket water drain (PG&E, 1968). The relocated OWS is visible in the a 1967 aerial photograph (PG&E, 1967) and is shown as existing on a Drawing 386121 (PG&E, 1982). Drawing 481785 (Revision 27) (PG&E, 1991) also indicates that the API oil/water separator was relocated. Mechanical oil skimming was added in 1970 (PG&E, 1972). Information regarding operation of the OWS prior to 1967 is provided in Appendix B21 (AOC 24).

The former OWS was approximately 4.5 feet deep, 15 feet long, and 6 feet wide and was constructed of 6-inch-thick concrete (Kearny, 1987; PG&E 1970b). It received oily water from Unit 4.3 (Kearny, 1987). The unit was equipped with an underflow weir to control discharges and a suction pump on the effluent end to collect and remove floating oil. The floating oil was transferred by flexible hose to a Portable Waste Oil Storage Tank (Unit 4.5). From 1967 to 1969, effluent from the OWS may have been directed to the former sludge drying beds and processed along with the cooling-water blowdown through the single-step chromium treatment system prior to discharge. From 1969 through October 1985, effluent from the OWS was routed to the chromate reduction tank and was processed along with the cooling-water blowdown through the two-step chromium treatment system prior to being discharged. In November 1985, the chromate reduction tank was converted into a holding tank (Kearny, 1987), and the discharge from the OWS was routed to either the holding tank or the transfer sump prior to discharge.

Chemical analysis data for wastewater processed through the OWS indicate that the wastewater contained up to 60 milligrams per liter oil and grease (Brown and Caldwell, 1986). Detectable concentrations of some metals, including total chromium, copper, and zinc, were also present in the wastewater. No indication of a release was observed during a facility inspection performed as part of the RFA (Kearny, 1987).

The OWS was closed and removed between November 1989 and March 1990 (Mittelhauser, 1990b). The steps taken during closure of the OWS included:

- Hydroblasting the concrete OWS. The hydroblast water was containerized and disposed of as hazardous waste.
- Breaking up the concrete OWS. Due to oily sludge that could not be adequately removed, a majority of the concrete was disposed of as hazardous waste.
- Excavating approximately 14 cubic yards of visibly stained soil. The soil was removed from the area around the former OWS and was disposed of as hazardous waste.
- Collecting three initial confirmation samples (OWS-10, OWS-11, and OWS-12).
- Removing another 5 cubic yards of soil in the vicinity of former sample 1042-55-12; the soil was disposed of as a hazardous waste.
- Collecting another confirmation sample (OWS-12-deeper).
- Backfilling the pit with local material and performing final grading.

After removal of the OWS and visibly stained soil, three soil samples were collected from the excavation (OWS-10, OWS-11, and OWS-12) and were analyzed for total petroleum hydrocarbons (TPH) using USEPA Method 8015. Based on the work plan (Mittelhauser, 1989), the cleanup criterion for soil was established at 10,000 milligrams per kilogram (mg/kg) TPH. Sample 1042-55-12 contained TPH at a concentration exceeding the cleanup criterion, so an additional 5 cubic yards of soil were excavated from that area. A fourth confirmation sample (OWS-12-deeper) was then collected. The locations of the samples are depicted in Figure B25-1.

1.3 Unit 4.5 Former Waste Oil Storage Tank

The Portable Waste Oil Storage Tank was identified by the USEPA in the RFA (Kearny, 1987) but was not subsequently designated as a SWMU or AOC by DTSC. The Portable Waste Oil Storage Tank was located in the southern portion of the lower yard adjacent to the OWS (Unit 4.4), as depicted in Figure B25-1.

The Portable Waste Oil Storage Tank consisted of an enclosed steel tank about 6 feet long and 2 feet in diameter, mounted horizontally on a trailer (Kearny, 1987). The tank was connected to a suction pump within the OWS with a flexible hose. The portable tank was stationed on a concrete pad that was bermed on three sides with a 6-inch-high curb. The fourth side of the pad was left open to allow removal of the unit.

The tank was used to collect floating oil from the OWS. When the tank was full, it was transported to the east side of the facility and placed next to the stationary waste oil storage tank (Unit 4.6). Oil within the portable tank was then transferred to the stationary tank. Starting in 1975, oil within the stationary tank was periodically removed, initially sold for reuse, and later transported offsite for recycling (PG&E, 1980; Riddle, 2004).

The Portable WasteOil Storage Tank was removed from service in 1989. During the removal of the transfer sump (SWMU 9) and the OWS (Unit 4.4), the portable tank was used to temporarily hold waste oil removed from the sump and OWS. The waste oil was subsequently removed from the portable tank, and the tank was then transported offsite to Chemical Transportation in Wilmington (Mittelhauser, 1990a). No indication of a release associated with the portable waste oil storage tank was observed during a facility inspection performed as part of the RFA (Kearny, 1987).

The steps taken during closure of the Portable Waste Oil Storage Tank included:

- Waste oil in the tank was transferred to the waste oil storage tank (Unit 4.6) and was ultimately transported offsite for recycling.
- The empty tank was then transported offsite to Chemical Transportation for disposal or recycling.
- The concrete pad was demolished and disposed of along with the concrete from the OWS.

In addition to the OWS itself, the associated influent piping was closed. Pressure testing suggested that pipe segment I-1 may have been leaking. Complete details regarding the closure of this system are presented in the *Closure Activity Report, Oil Water Separator System, Topock Compressor Station* (Mittelhauser, 1990b). This report includes a description of the closure activities and contains the data from disposal characterization sampling, disposal manifesting information, and ultimate disposal locations. Soil sampling results are provided in Table B25-1.

2.0 Summary of Past Soil Characterization

Three historical subsurface soil samples were collected from three locations (OWS-10, OWS-11, and OWS-12-deeper) in Unit 4.4, as shown in Figure B25-1. The precise depth of the samples is not known; however, the samples were collected from the excavation below the former OWS. Approximately 19 cubic yards of soil were removed from the excavation, suggesting that the soil samples were likely collected at depths between 1 and 2 feet below ground surface (bgs). Historical soil samples were analyzed for TPH-extractables only.

In addition to the samples collected from the excavation beneath the former OWS, two samples were collected underneath piping (I-1 segment) and a valve on the I-1 segment, respectively (OWS PI-1 and OWS Valve PI-1). The I-1 pipe segment was the pipe segment that carried the influent to the Oil/Water Holding Tank. Because pressure testing suggested that this pipe may have leaked, accessible portions were exposed, visually inspected, then removed. Visibly stained soil from around the piping was also excavated and disposed of. Inaccessible piping was capped and left in place. The two I-1 pipelines segment samples were analyzed for TPH-gasoline, TPH-diesel, TPH-motor-oil, and TPH-jet-fuel. TPH-motor-oil was the only TPH constituent detected. This constituent was detected at concentrations of 850 and 1,200 mg/kg, respectively, in the two samples. These concentrations are below the applicable California Regional Water Quality Control Board environmental screening level of 1,800 mg/kg.

Laboratory analytical results for the historical soil samples are presented in Table B25-1. The historical data are considered Category 2.

This unit was closed by DTSC in 1995. Subsequent to this closure, DTSC requested that additional analysis be conducted for Title 22 metals, hexavalent chromium, pH, volatile organic compounds (VOCs), TPH, and semivolatile organic compounds (SVOCs) in soil at Units 4.3, 4.4, and 4.5 (DTSC, 2006). Chemicals of potential concern are anticipated to be limited to soil only (CH2M HILL, 2007). Section 3.0 of this subappendix provides the recommended sampling for this unit.

3.0 Units 4.3, 4.4, and 4.5 Proposed Sampling

3.1 Units 4.3, 4.4, and 4.5 Access Constraints

As discussed in Section 3.0 and Figure B-3 in Appendix B, there are substantial access constraints within the compressor station. Units 4.3, 4.4, and 4.5 are located on the boundary between Areas 3 and 4 on Figure B-3, Topock Compressor Station Accessibility Map, in the main text of Appendix B. Units 4.3, 4.4, and 4.5 are located in or partially located within a paved roadway in the compressor station. Proposed sample locations Unit 4.3-1 and Unit 4.3-2 are located within the paved roadway and likely are accessible by hydrovac. The accessibility assessment the proposed samples in Units 4.3, 4.4, and 4.5 can be found in Table B25-2. Twenty-three utility risers, including gas, odorant, wastewater, electrical, SCADA, and an emergency shutoff device, are located in Area 3. In addition, a utility trench, a cathodic protection anode, and three vaults were identified in Area 3. Twenty-three utility risers, including water, electrical, telecommunications, and cooling-water lines, were identified in Area 4. In addition, the area contains an active and an abandoned cathodic protection anode. Photographs 60 and 61 in Appendix B25 show the accessibility constraints in Units 4.3, 4.4, and 4.5. Sample locations and depths identified for Units 4.3, 4.4, and 4.5 reflect the identified access constraints and the phased sampling approach described in Section 4.0 of Appendix B.

3.2 Units 4.3, 4.4, and 4.5 Proposed Sampling

Although Units 4.3 through 4.5 were closed in 1995, additional sampling for organic chemicals of potential concern and sampling of the fill used to backfill the excavation is proposed, as required by DTSC. Table B25-1 summarizes the proposed Units 4.3, 4.4, and 4.5 sample locations, depths, description/rationale for each location (that is, the data gaps they would address), and analytes. Proposed sample locations are also shown in Figure B25-1. The proposed Units 4.3, 4.4, and 4.5 samples were defined in collaboration with DTSC and United States Department of the Interior and will be optimized and sampled in accordance with the phased sampling approach outlined in Section 4.0 of Appendix B.

Samples will be collected at two locations (Unit 4.3-1 and Unit 4.3-2) and will address all three units. Samples are proposed to be collected at the surface (0 to 1 foot bgs) and from the shallow subsurface interval (2 to 3 feet bgs) in accordance with the phased sampling protocol. Because the area of sampling is covered with concrete or asphalt, the surface sampling interval will begin at the bottom of the concrete/asphalt or gravel subbase. In most cases, this first interval will be from 0.5 to 1 foot below the pavement. Proposed samples for nearby AOCs will also be used to characterize soil for this unit, as shown on Figure B25-1. All samples will be analyzed for Title 22 metals, hexavalent chromium, pH, VOCs, TPH, SVOCs, polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbon (PAHs). As required by the United States Department of the Interior, 10 percent of all samples collected during the investigation will be analyzed for the full Target Analyte List/Target Compound List constituent suite.

4.0 References

Brown and Caldwell. 1986. *Report of Analytical Results, Log No. E86-11-434*. December 16.

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Tables

TABLE B25-1

Sample Results: Total Petroleum Hydrocarbons

Unit 4.3, 4.4, 4.5 – Oil/Water Holding Tank, Oil/Water Separator, and Portable Waste Oil Storage Tank

Soil Investigation Part B Work Plan

Pacific Gas and Electric Company Topock Compressor Station Needles, California

				Total Petroleum Hydrocarbons (mg/kg)				
Commercial Screening Level [1]:				**NE**	**NE**	**NE**	**NE**	**NE**
RWQCB Environmental Screening Level [2]:				**NE**	**540**	**540**	**1,800**	**NE**
Background [3]:				**NE**	**NE**	**NE**	**NE**	**NE**
Location	**Date**	**Depth (ft bgs)**	**Sample Type**	**TPH as jet fuel**	**TPH as diesel**	**TPH as gasoline**	**TPH as motor oil**	**TPH-extractables**
Category3								
OWS PI-1	11/17/89		N	ND (3)	ND (5)	ND (8)	1,200	---
OWS Valve PI-1	11/17/89		N	ND (3)	ND (5)	ND (8)	850	---
OWS-10	11/18/89		N	---	---	---	---	ND (2)
OWS-11	11/18/89		N	---	---	---	---	ND (1)
OWS-12 Deeper	03/20/90		N	---	---	---	---	18

Notes:

1 Commercial screening level - commercial DTSC CHHSL. If the commercial DTSC CHHSL is not established, the USEPA regional screening level is used.

2 RWQCB. 2008. "Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater" (Table K-1). May 27.

3 CH2M HILL. 2009. "Final Soil Background Technical Memorandum at Pacific Gas and Electric Company Topock Compressor Station, Needles, California." May.

Results greater than or equal to the Background value are bolded. Results greater than or equal to the Commercial Screening level or RWQCB ESL are circled.

NE = not established

USEPA = United States Environmental Protection Agency

DTSC = California Department of Toxic Substances Control

RWQCB = California Regional Water Quality Control Board

CHHSL = California human health screening levels

TPH = Total Petroleum Hydrocarbon

-- = not analyzed

FD = Field Duplicate

ft bgs = feet below ground surface

J = concentration or reporting limit estimated by laboratory or data validation

mg/kg = milligrams per kilogram

N = Primary Sample

ND = not detected at the listed reporting limit

TABLE B25-2
Proposed Sampling Plan, Units 4.3, 4.4, and 4.5 – Oil/Water Holding Tank, Oil/Water Separator and Portable Waste Oil Storage Tank
Soil Investigation Part B Work Plan,
PG&E Topock Compressor Station, Needles, California

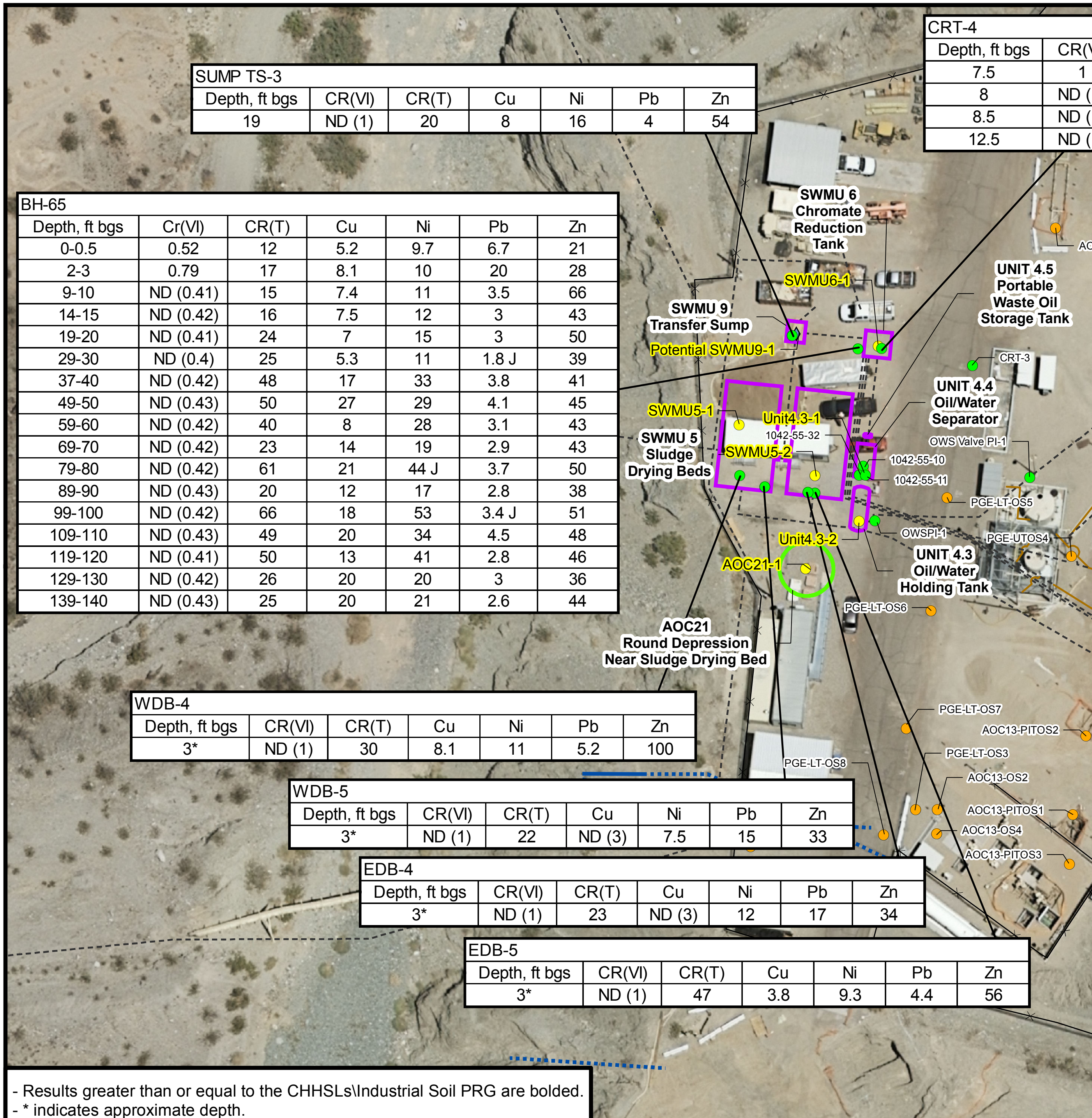
Location	Depths (feet bgs)	Description/Rationale	Analytes	Accessibility Assessment
Unit4.3-1	0-1[a] and 3, if feasible	Collect additional soil samples to analyze for organics	Title 22 metals, hexavalent chromium, pH, VOCs, TPH, SVOCs, PCBs, and PAHs	Not suitable for x-ray fluorescence Likely accessibly by hydrovac
Unit4.3-2	0-1[a] and 3, if feasible	Collect additional soil samples to analyze for organics	Title 22 metals, hexavalent chromium, pH, VOCs, TPH, SVOCs, PCBs, and PAHs	Not suitable for x-ray fluorescence Likely accessibly by hydrovac

Notes:

[a] Surface soil sample intervals in paved areas are approximate. Surface soil samples will be collected beneath the asphalt/concrete and/or sub-gravel base.

Ten percent of samples from the investigation will be analyzed for Target Analyte List/Target Compound List constituents.
VOC analysis will not be conducted on surface soil samples (0 to 0.5 foot bgs).

Figures



SUMP TS-3

Depth, ft bgs	CR(VI)	CR(T)	Cu	Ni	Pb	Zn
19	ND (1)	20	8	16	4	54

CRT-4

Depth, ft bgs	CR(VI)	CR(T)	Cu	Ni	Pb	Zn
7.5	1	120	14	19	6	96
8	ND (1)	23	7	14	2	47
8.5	ND (1)	21	8	18	3	49
12.5	ND (1)	43	8.3	8.1	1.9	59

BH-65

Depth, ft bgs	Cr(VI)	CR(T)	Cu	Ni	Pb	Zn
0-0.5	0.52	12	5.2	9.7	6.7	21
2-3	0.79	17	8.1	10	20	28
9-10	ND (0.41)	15	7.4	11	3.5	66
14-15	ND (0.42)	16	7.5	12	3	43
19-20	ND (0.41)	24	7	15	3	50
29-30	ND (0.4)	25	5.3	11	1.8 J	39
37-40	ND (0.42)	48	17	33	3.8	41
49-50	ND (0.43)	50	27	29	4.1	45
59-60	ND (0.42)	40	8	28	3.1	43
69-70	ND (0.42)	23	14	19	2.9	43
79-80	ND (0.42)	61	21	44 J	3.7	50
89-90	ND (0.43)	20	12	17	2.8	38
99-100	ND (0.42)	66	18	53	3.4 J	51
109-110	ND (0.43)	49	20	34	4.5	48
119-120	ND (0.41)	50	13	41	2.8	46
129-130	ND (0.42)	26	20	20	3	36
139-140	ND (0.43)	25	20	21	2.6	44

WDB-4

Depth, ft bgs	CR(VI)	CR(T)	Cu	Ni	Pb	Zn
3*	ND (1)	30	8.1	11	5.2	100

WDB-5

Depth, ft bgs	CR(VI)	CR(T)	Cu	Ni	Pb	Zn
3*	ND (1)	22	ND (3)	7.5	15	33

EDB-4

Depth, ft bgs	CR(VI)	CR(T)	Cu	Ni	Pb	Zn
3*	ND (1)	23	ND (3)	12	17	34

EDB-5

Depth, ft bgs	CR(VI)	CR(T)	Cu	Ni	Pb	Zn
3*	ND (1)	47	3.8	9.3	4.4	56

- Results greater than or equal to the CHHSLs\Industrial Soil PRG are bolded.
- * indicates approximate depth.

LEGEND

- Proposed Soil Sample Location
- Proposed Contigency Sample Location
- Existing Soil Sample Location
- Existing Opportunistic Soil Sample Location
- AOC Boundary
- SWMU / Unit Boundary
- Site Boundary Fence
- Former/Abandoned Transfer Piping
- Active Transfer Piping
- Approximate Location of Stormwater Piping Below Ground
- Approximate Location of Stormwater Piping Above Ground

0 20 40 80 Feet

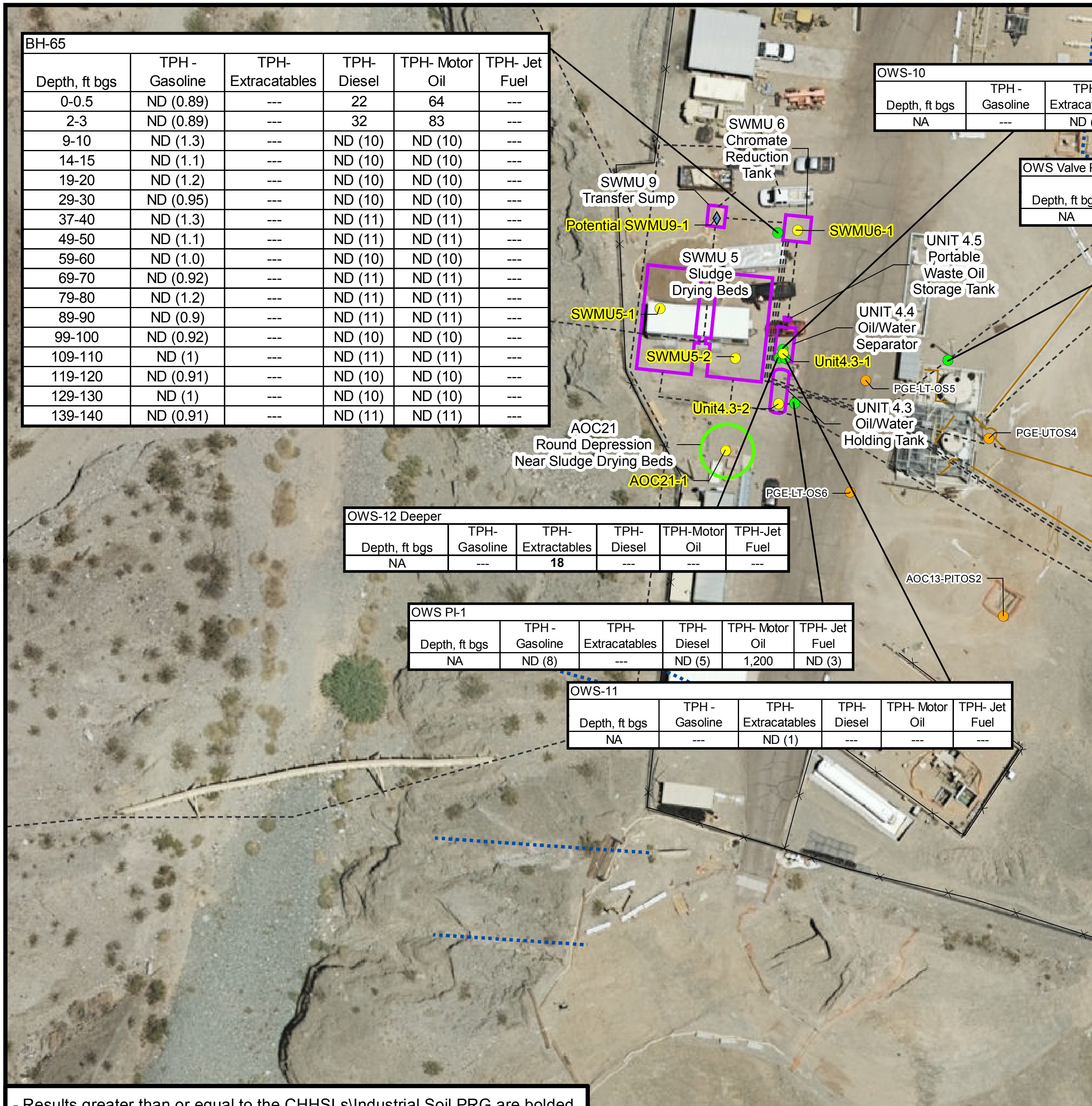
N

FIGURE B5-1
SOIL SAMPLE RESULTS - METALS
SOLID WASTE MANAGEMENT UNITS 5, 6, 9, UNITS 4.3, 4.4, 4.5, AND AREA OF CONCERN 21

SOIL INVESTIGATION PART B WORK PLAN
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\SWP_B\SWMU5-9\SWMU5_9_RESULT_METAL.mxd



BH-65

Depth, ft bgs	TPH - Gasoline	TPH- Extracatables	TPH- Diesel	TPH- Motor Oil	TPH- Jet Fuel
0-0.5	ND (0.89)	---	22	64	---
2-3	ND (0.89)	---	32	83	---
9-10	ND (1.3)	---	ND (10)	ND (10)	---
14-15	ND (1.1)	---	ND (10)	ND (10)	---
19-20	ND (1.2)	---	ND (10)	ND (10)	---
29-30	ND (0.95)	---	ND (10)	ND (10)	---
37-40	ND (1.3)	---	ND (11)	ND (11)	---
49-50	ND (1.1)	---	ND (11)	ND (11)	---
59-60	ND (1.0)	---	ND (10)	ND (10)	---
69-70	ND (0.92)	---	ND (11)	ND (11)	---
79-80	ND (1.2)	---	ND (11)	ND (11)	---
89-90	ND (0.9)	---	ND (11)	ND (11)	---
99-100	ND (0.92)	---	ND (10)	ND (10)	---
109-110	ND (1)	---	ND (11)	ND (11)	---
119-120	ND (0.91)	---	ND (10)	ND (10)	---
129-130	ND (1)	---	ND (10)	ND (10)	---
139-140	ND (0.91)	---	ND (11)	ND (11)	---

OWS-10

Depth, ft bgs	TPH - Gasoline	TPH- Extracatables	TPH- Diesel	TPH- Motor Oil	TPH- Jet Fuel
NA	---	ND (2)	---	---	---

OWS Valve PI-1

Depth, ft bgs	TPH - Gasoline	TPH- Extracatables	TPH- Diesel	TPH- Motor Oil	TPH- Jet Fuel
NA	ND (8)	---	ND (5)	850	ND (3)

OWS-12 Deeper

Depth, ft bgs	TPH- Gasoline	TPH- Extracatables	TPH- Diesel	TPH-Motor Oil	TPH-Jet Fuel
NA	---	**18**	---	---	---

OWS PI-1

Depth, ft bgs	TPH - Gasoline	TPH- Extracatables	TPH- Diesel	TPH- Motor Oil	TPH- Jet Fuel
NA	ND (8)	---	ND (5)	1,200	ND (3)

OWS-11

Depth, ft bgs	TPH - Gasoline	TPH- Extracatables	TPH- Diesel	TPH- Motor Oil	TPH- Jet Fuel
NA	---	ND (1)	---	---	---

- Results greater than or equal to the CHHSLs\Industrial Soil PRG are bolded.

LEGEND

- Proposed Soil Sample Location
- Proposed Contigency Sample Location
- Existing Opportunistic Soil Sample Location
- Existing Soil Sample Location
- Site Boundary Fence
- Approximate Location of Stormwater Piping Below Ground
- Approximate Location of Stormwater Piping Above Ground
- Former/Abandoned Transfer Piping
- Active Transfer Piping
- AOC Boundary
- SWMU / Unit Boundary

0 20 40 80 Feet

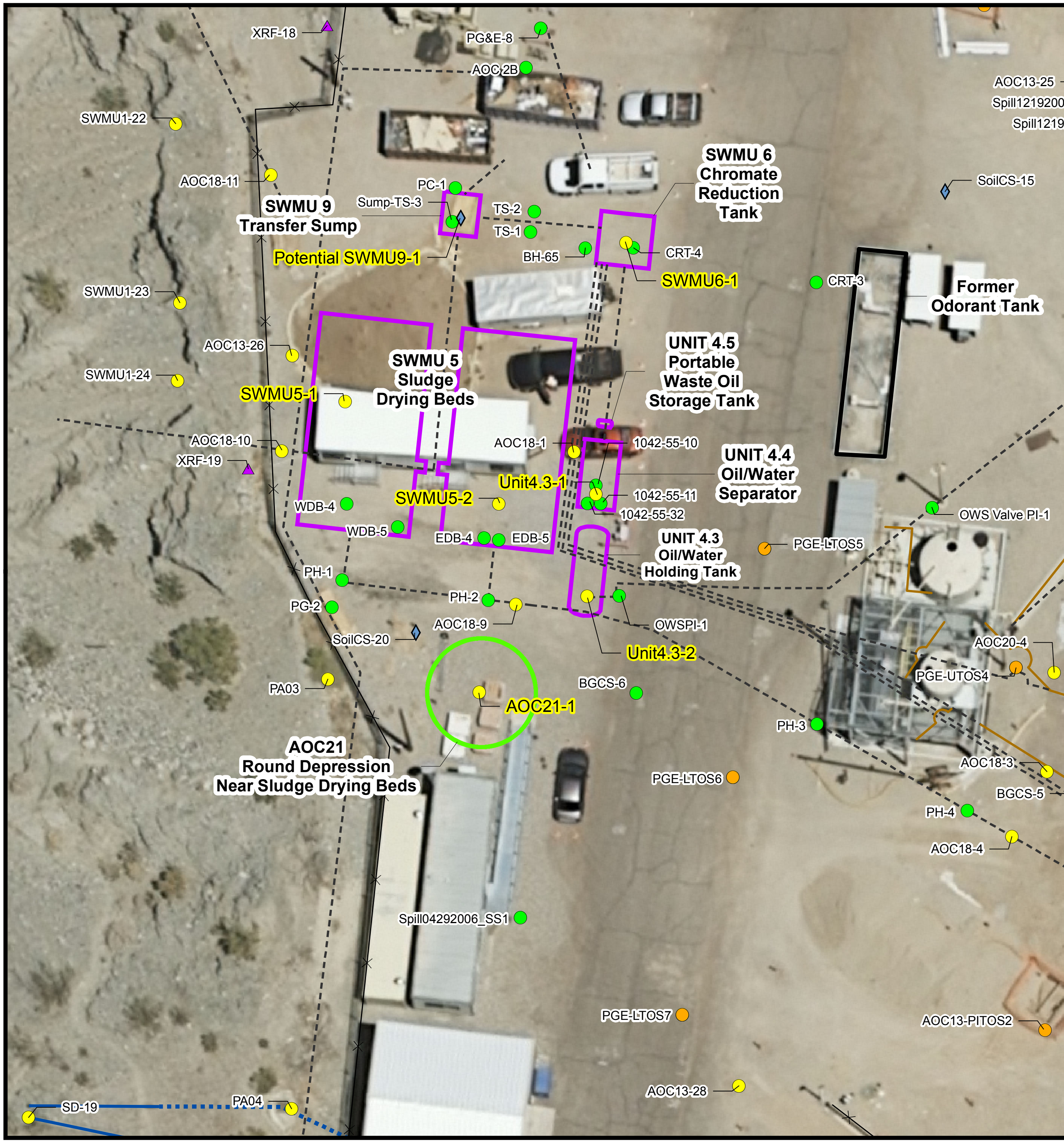
N

FIGURE B25-2
SOIL SAMPLE RESULTS - TOTAL PETROLEUM HYDROCARBONS UNITS 4.3, 4.4, AND 4.5

SOIL INVESTIGATION PART B WORK PLAN
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2012\SWP_B\SWMU5-9\SWMU5_9_RESULT_TPH.mxd



LEGEND

- Proposed Soil Sample Location
- Proposed Soil Gas and Soil Sampling Location
- Proposed Contigency Sample Location
- Proposed XRF Screening Location
- Existing Soil Sample Location
- Existing Opportunistic Soil Sample Location
- Site Boundary Fence
- Former/Abandoned Transfer Piping
- Active Transfer Piping
- Approximate Location of Stormwater Piping Below Ground
- Approximate Location of Stormwater Piping Above Ground
- AOC Boundary
- SWMU Boundary

0 10 20 40 Feet

N

FIGURE B25-3
PROPOSED SOIL SAMPLE LOCATIONS SOLID WASTE MANAGEMENT UNITS 5, 6, 9, UNITS 4.3, 4.4, 4.5, AND AREA OF CONCERN 21

SOIL INVESTIGATION PART B WORK PLAN
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

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Appendix B26
Accessibility Evaluation Photograph Log

Photograph 1: AOC 5 Cooling Tower A, southeast corner looking north, showing control cabinet

Photograph 2: AOC 5 Cooling Tower A, southwest corner looking north

Photograph 3: AOC 5 Cooling Tower A, south side, showing hot basin area

Photograph 4: AOC 5 Cooling Tower A, south side, showing former location of cooling water treatment chemical and sulfuric acid tanks

Photograph 5: AOC 5 Cooling Tower A, southwest corner, looking south, showing hot basin area

Photograph 6: AOC 5 Cooling Tower A, southwest corner, showing main gas line

Photograph 7: AOC 6 Cooling Tower B, east side looking north

Photograph 8: AOC 6 Cooling Tower B, west side, looking north

Photograph 9: AOC 6 Cooling Tower B, looking southeast to northwest

Photograph 10: AOC 6 Cooling Tower B east side, showing former sulfuric acid tank location (SWMU 11)

Photograph 11: AOC 6 Cooling Tower B, east side, showing portion of SWMU 11 Former Sulfuric Acid Tanks

Photograph 12: AOC 7 Hazardous Materials Storage Area and Carpenter Shop, east side, looking northwest

Photograph 13: AOC 7 Hazardous Materials Storage Area and AOC 8 Paint Locker, west side, looking southeast

Photograph 14: AOC 8 Paint Locker, south side, looking northwest toward AOC 23, Former Water Conditioning Building

Photograph 15: AOC 13, Unpaved Areas at the Compressor Station, example of unpaved area on east side of Compressor Building

Photograph 16: AOC 13, Unpaved Areas at the Compressor Station, showing miscellaneous utilities, southeast portion of lower yard

Photograph 17: AOC 15, Auxiliary Jacket Cooling Water Pumps, south side, looking east

Photograph 18: AOC 15, Auxiliary Jacket Cooling Water Pumps, looking north to Control Building

Photograph 19: AOC 15 Auxiliary Jacket Cooling Water Pumps, looking northeast from southwest

Photograph 20: AOC 15 Auxiliary Jacket Cooling Water Pumps, looking north, Control Building in Background

Photograph 21: SCADA cabinets immediately west of AOC 15, Auxiliary Jacket Cooling Water Pumps

Photograph 22: AOC 15, Auxiliary Jacket Cooling Water Pumps, east access, looking west

Photograph 23: AOC 15, Auxiliary Jacket Cooling Water Pumps, looking west

Photograph 24: AOC 15, Auxiliary Jacket Cooling Water Pumps, looking southeast

Photograph 25: AOC 15, Auxiliary Jacket Cooling Water Pumps, looking southeast from SCADA cabinets on west side of unit

Photograph 26: AOC 16,Sandblast Shelter, Utilities along fence line north of unit

Photograph 27: AOC 17,Onsite Septic System, showing southeast side of Steam-cleaning Area, and part of Visitor Parking Lot, looking northeast

Photograph 28: AOC 19, Former Cooling Liquid Mixing Area and Former Hotwell, showing unpaved area north of former hotwell, by temporary compressor engine oil holding tanks

Photograph 29: AOC 19, Former Cooling Liquid Mixing Area and Former Hotwell, northwest corner looking east-southeast

Photograph 30: AOC 19, Former Cooling Liquid Mixing Area and Former Hotwell, Concrete pad area looking down and southeast from former hotwell area

Photograph 31: AOC 19, Former Cooling Liquid Mixing Area and Former Hotwell, unpaved area north of former hotwell, second view

Photograph 32: AOC 19, Former Cooling Liquid Mixing Area and Former Hotwell, west side, looking east

Photograph 33: Obstructions east of AOC 19, Former Cooling Liquid Mixing Area and Former Hotwell, looking east from inside AOC 19

Photograph 34: AOC 19, Former Cooling Liquid Mixing Area and Former Hotwell, east side, looking north, showing utilities, raised foundation in former hotwell area and access

Photograph 35: AOC 19, Former Cooling Liquid Mixing Area and Former Hotwell, east side, looking north, showing utilities and access

Photograph 36: AOC 19, Former Cooling Liquid Mixing Area and Former Hotwell, east side, looking northwest, showing utilities, raised foundation in former hotwell area, and access

Photograph 37: AOC 19, Former Cooling Liquid Mixing Area and Former Hotwell, north side, looking west-southwest

Photograph 38: AOC 19, Former Cooling Liquid Mixing Area and Former Hotwell, south side, looking northeast

Photograph 39: AOC 19, Former Cooling Liquid Mixing Area and Former Hotwell, south side, looking west, showing part of inside of containment for temporary compressor engine oil holding tanks

Photograph 40: AOC 19, Former Cooling Liquid Mixing Area and Former Hotwell, south side, looking west-southwest toward south Jacket Cooler Control Panel

Photograph 41: AOC 19, Former Cooling Liquid Mixing Area and Former Hotwell, west side, looking east, showing access on north side of former hotwell area

Photograph 42: AOC 19, Former Cooling Liquid Mixing Area and Former Hotwell, south side, looking west

Photograph 43: AOC 19, Former Cooling Liquid Mixing Area and Former Hotwell, west side, looking east-northeast

Photograph 44: View of former AOC 22,Unidentified Three-sided Structure, location, west fence line, south side of lower yard

Photograph 45: AOC 23, Former Water Conditioning Building, north side, looking southeast, showing variable foundation heights

Photograph 46: AOC 23, Former Water Conditioning Building, east side, and Fire Pump Building, looking west

Photograph 47: AOC 23, Former Water Conditioning Building, west side, and Fire Pump Building, looking east

Photograph 48: AOC 23, Former Water Conditioning Building, Close-up of Foundation of Water Conditioning Building and adjacent utilities, looking northeast

Photograph 49: Utilities between Fire Pump Building and AOC 23, Former Water Conditioning Building, looking west

Photograph 50: View of AOC 24, Stained Area and Former API Oil/Water Separator, looking southwest from upper yard

Photograph 51: AOC 25, Compressor and Generator Engine Basements, showing pipes entering compressor engine basement

Photograph 52: AOC 25, Compressor and Generator Engine Basements, east side of Compressor Building looking north, showing paved and unpaved areas under piping

Photograph 53: AOC 25 Compressor and Generator Engine Basements, Auxiliary Building, east side, showing utilities, looking south

Photograph 54: AOC 25 Compressor and Generator Engine Basements, Auxiliary Building, east side, looking south

Photograph 55: AOC 25, Compressor and Generator Engine Basements, Auxiliary Building, west side, northern portion, looking northeast

Photograph 56: AOC 25 Compressor and Generator Engine Basements, Auxiliary Building, west side, southern half, looking south-southeast

Photograph 57: AOC 26, Former Scrubber Oil Sump, showing area of former excavation

Photograph 58: AOC 26, Former Scrubber Oil Sump, view into area of former sump, looking southwest

Photograph 59: AOC 26, Former Scrubber Oil Sump, view into area of former sump, showing piping and other access constraints

Photograph 60: View of former Oily Water Treatment System, SWMU 5, SWMU 6, SWMU 9, and AOC 21 area from New Odorant Tank, looking northwest

Photograph 61: View toward former Oily Water Treatment System, SWMU 5, SWMU 6, SWMU 9, and AOC 21 area from valve nest west of south scrubbers, looking southwest

Photograph 62: Overview, looking down on the lower yard from north to south

Photograph 63: Overview of lower yard, showing western portion of lower yard, looking southwest from upper yard

Photograph 64: AOC 32 Oil Storage Tanks and Waste Oil Sump, looking northeast from Control Building

Photograph 65: AOC 32 Oil Storage Tanks and Waste Oil Sump, looking west from Visitor Parking Lot

Photograph 66: AOC 32 Oil Storage Tanks and Waste Oil Sump, looking south along east side of oil storage tank area

Photograph 67: AOC 33, Potential Former Burn Area, looking south from north portion of Visitor Parking lot

Subappendix B27
Documentation of Compliance and Response to California Department of Toxic Substances Control, Fort Mohave Indian Tribe, and Colorado River Indian Tribe Comments on the 2007 Draft Soil Part B Work Plan

Comment No.	2008 DTSC Comment	2010 PG&E Response	2010 DTSC Response	2011 PG&E Response
General 1	The Department of Toxic Substances Control (DTSC) has conducted an evaluation of historic site related photographs provided subsequent to the RFI Part B Work Plan and provided comments in a GSU memorandum dated February 12, 2008. Areas identified in the review memo which occur within the facility fence line should be evaluated as part of the Part B work plan. Please provide a response to address those concerns and revise the workplan accordingly.	Comment acknowledged. Responses to these comments have been included with this comment response document.	No response necessary.	No response necessary.
General 2	The (DTSC) understands the limitations of investigating operating industrial facilities. However, an identification, rationale and discussion of units which cannot be adequately investigated and characterized while the facility is in operation is required. Please provide an evaluation of adequacy of investigation for each Solid Waste Management Unit (SWMU) and Area of Concern (AOC) including the proposed investigation and historical investigation. Additionally, provide a discussion of areas which cannot be characterized under normal operation, but where investigation might be undertaken if operations are offline for maintenance, etc. Additionally, please discuss additional sampling that can be conducted currently at Compressor Number 1. It is understood that this unit no longer operates and will remain offline as it has been used for parts.	The requested information will be provided in the revised Part B Workplan. A map will be developed and included in the Revised Part B Work Plan that will identify various access limitations within the Compressor Station. PG&E recommends a site visit to review proposed sampling locations to understand safety and access limitations to sampling within the Compressor Station. With respect to investigation at Unit 1, the gas compression process was thoroughly evaluated in the Final RFI/RI Volume 1. This included documenting the chemical use and waste generation and management. The compressors were not identified as a SWMU or AOC in the RFI/RI.	Field observations have identified the Compressor Engines as an AOC and shall therefore be designated as AOC 26, Compressor Engines. Large oily sump reservoirs were noted below the engines that were not described in the RFI Volume 1. A field visit is requested to assist in better understanding the unit. PG&E's proposed site visit to address access limitations must be conducted early in the process to assist in developing the work plan.	The Compressor Engines were designated AOC 25.
General 3	Background upper threshold limits (UTLs) for soils are yet to be determined for this project. Prior to any comparisons of site investigation data to background thresholds, an agreement must be achieved on the background dataset and the resultant statistical evaluations. The existing background dataset is useful in assessing the relative concentrations of constituents of potential concern (COPCs) at the site and DTSC acknowledges that additional background investigation is proposed as part of the November 2006 RFI Part A Workplan, however, the timing relationship of the background investigation and the on site Part A investigation should be stated to provide assurance that	The additional background investigation has been completed. The revised final technical memorandum was submitted and accepted by DTSC (*Revised Final Soil Background Investigation at Pacific Gas and Electric Company Topock Compressor Station, Needles, California*; CH2M HILL, May 2009).	DTSC acknowledges receipt of the 2009 background soil technical memorandum.	No response necessary.

Comment No.	2008 DTSC Comment	2010 PG&E Response	2010 DTSC Response	2011 PG&E Response
	the background evaluation will be conducted first and soil data will be compared with the agreed upon background values.			
General 4	Sample depths proposed in the text of the document should be considered default values; however, significant lithologic changes, evidence of impact or other conditions warrant additional samples in place of or in addition to the defined depths.	During sampling if field conditions indicate that a greater sample depth is needed, PG&E will sample to a deeper depth as long as this meets the objectives of the work plan and the deeper samples can be collected safely. The maximum vertical sampling depth may be adjusted (up or down) based on field conditions.	Please note that the original DTSC comment is potentially requiring additional samples as well as potential adjustment of default sample depths. PG&E must ensure that this issue is documented in the text of the revised work plan.	A detailed accessibility evaluation was conducted as part of the work plan preparation process and is documented in Appendix B. Proposed sample locations and depths were determined based on the Part B DQOs evaluation and accessibility constraints.
General 5	If the results of the investigation indicate that contamination is present at any location in the deepest sample collected, additional sampling may be required by DTSC. The investigation will not be complete until the extent of contamination is adequately defined. Please provide a plan to address any areas in which the initial phase of sampling does not define the extent of contamination.	The data evaluation process illustrated in the draft Part B DQO decision flow charts (included in this comment response document) is designed to identify data gaps, if any, after the investigation described in the workplan is completed. Further sampling to fill the data gaps will be determined following the Part B data gaps evaluation and completion of DQO steps 6 and 7.	No response necessary.	No response necessary.
General 6	Each of the tables describing the proposed sampling programs (e.g., 5-3, 5-5, 5-7…) should include the rationale for each proposed boring, not just a description of the location. Please revise the applicable tables to include sampling rationale.	An additional column describing the rationale will be provided.	No response necessary.	No response necessary.
General 7	The work plan states that sampling for individual AOCs will be conducted to the currently defined boundary of the AOC. Any impacts beyond the boundary will be addressed as part of AOC 13. Characterization of AOCs and SWMUs should be completed specific to each unit. Sampling should continue in each area until the limits of impact are defined. The boundary can then be refined to include areas affected by the operation of the unit.	Comment noted. DTSC's proposed approach was agreed to by PG&E and DTSC during our discussion of the work plan assumptions in July 2007.	DTSC reiterates the original comment, characterization of AOCs and SWMUs should be completed specific to each unit. Sampling should continue for each unit, regardless of the current unit boundary, until the limits of impact are defined. The unit boundary can then be refined to include areas affected by the operation of the unit. Please revise the text of the work plan to ensure that the DTSC comment is addressed.	This text was removed from the work plan.
General 8	Uncertainty remains as to the usability of the historic data for characterization or risk assessment purposes. Evaluation of the Data Usability Assessment is ongoing and should be considered in the proposed sampling	Comment acknowledged. The Data Usability Assessment (DUA) has now been completed and accepted by DTSC and DOI (*Final Soil and Sediment Data Usability Assessment Technical Memorandum,*	No response necessary.	No response necessary.

Comment No.	2008 DTSC Comment	2010 PG&E Response	2010 DTSC Response	2011 PG&E Response
	program to ensure that all data are sufficient and adequate for risk assessment purposes. Currently, Category 2 data are not being considered eligible for risk assessment purposes unless the nature of any data deficiencies is clearly specified. A separate table should be included in the work plan to summarize the categories of the historic data. The table will illustrate that Category 2 or 3 data exits for some AOCs (i.e., AOCs 13 and 19) not identified in previous data usability assessments. The work plan should explicitly identify why each data set is assigned to a specific category (this should also be added to the summary table).	*PG&E Topock Compressor Station*; CH2M HILL, 2008). The DUA provides the basis for assigning each historic data point to a specific category (Categories 1, 2, 3). PG&E will provide the data quality categories for the historic data in table format in the workplan. Over 70% of the data within the compressor station fenceline are Category 2 or 3. Only Category 1 will be used for risk assessment, and Category 1 and 2 data will be used for site characterization. Category 3 data will provide additional insights regarding the potential extent of COPCs, but will not be relied upon to define the boundaries of contamination. (See the August 29, 2008 *Final Soil and Sediment Data Usability Assessment Technical Memorandum, PG&E Topock Compressor Station).*		
General 9	Several units that were formerly closed for inorganic constituents are currently being investigated since organic constituents were not included in the original investigation. It is recommended that metals analyses be included along with the organics as part of the scope of the proposed investigation for those closures with existing Category 2 metals data. The Category 2 metals data may be problematic as it may be inappropriate to use those data to assess cumulative risk. Collecting Category 1 metals data for these units will ensure that a risk assessment can be conducted if necessary.	As part of the DQO process (included in this comment response document), a data sufficiency evaluation will be performed to determine if there is adequate Category 1 data to address the various DQO decision statements.	Please revise the text of the work plan to ensure that the DTSC comment is addressed.	Inorganics analysis has been added to the closed SWMUs.
General 10	Field techniques, including x-ray fluorescence (XRF) should be tested at the site to determine if they can assist in locating conventional borings. The Fort Mojave Indian Tribe has specifically requested that field techniques of this nature be considered for Part A soil sampling programs. Conceptually, XRF surface sample data would provide information to place borings to collect conventional samples at proposed depths. Further, a phased approach to sampling could be utilized to limit the number of samples collected as well. Once data are obtained that shows the relative concentrations of COPCs, boring locations can be	The use of various non-invasive field techniques including XRF, will be evaluated for its use to help guide the Part B sampling program and if viable, will be included in the Revised Part B Work Plan.	Please revise the text of the workplan accordingly. Please note that XRF is being used extensively for field screening soils associated with the AOC 4 removal action.	Use of XRF was added as a field investigation methodology for debris in AOCs 10 and 14, and for soil in MW-24.

Comment No.	2008 DTSC Comment	2010 PG&E Response	2010 DTSC Response	2011 PG&E Response
	modified to ensure that additional samples obtain the data necessary for the investigation.			
General 11	Statements are provided that only one drill rig will likely be working within the facility fence line at any one time. The total amount of time for the investigation would be significantly reduced if additional drilling crews worked concurrently. Although drilling crew costs may be higher, savings may be realized for other factors related to the project including regulatory oversight costs. The DTSC recommends not limiting the workforce as part of the workplan process, but rather basing the number of crews on the needs of the investigation.	Due to the high risk posed by subsurface investigations within the boundaries of the compressor station, PG&E requires that 2 monitors be present at each subsurface investigation location. One monitor oversees the overall effort, the other monitor specifically evaluates the progress of the subsurface investigation effort. All boring locations must be hand-dug to 3 or more feet bgs to avoid potential damage to subsurface utilities. The Topock Compressor Station does not have sufficient available personnel or emergency response capability to support more than one investigation location at a time. Further, many of the proposed sample locations will require traffic to be restricted from various areas of the compressor stations and will require re-routing of traffic. Having two rigs working at the same time will not be possible due to internal compressor station traffic and access needs. The primary factor controlling the rate and progress of the investigation will be the need to hand dig every boring to a minimum of 3 feet bgs.	In an effort to increase drilling efficiency, an area can be pre-"cleared" by hand digging to clear an area prior to the arrival of a drill rig (a steel plate could be placed over open holes for safety). Additionally, DTSC notes that PG&E recently had several major pipeline retrofit excavations in 2008 occurring simultaneously onsite and assumes that they where completed safely. Multiple drill rigs on the site is certainly possible, but DTSC understands that one rig at a critical location can be problematic. DTSC again recommends not limiting the workforce as part of the work plan process, but rather basing the number of crews on the needs of the investigation. Please revise the text of the workplan accordingly.	The text was removed from the work plan. Field work will be scheduled as feasible based on PG&E staff resources.
General 12	The presence of above ground and below ground utilities in the vicinity of a proposed boring location may complicate the investigation, but will not automatically result in boring elimination. Relocating specific borings from proposed locations should only be conducted after DTSC approval. PG&E should have identified likely obstructions as part of the work plan preparation process and located proposed borings utilizing this information.	PG&E agrees that the presence of utilities will not necessarily result in boring elimination. PG&E is committed to obtaining DTSC approval to relocate borings, provided however, that such approval does not delay the progress of the field investigation. As described in General Comment 2, a map will be developed and included in the Revised Part B Work Plan that will identify various access limitations within the Compressor Station. Visible obstructions were located during an extensive site walk, and some proposed Part B areas were determined to be inaccessible. Many potential subsurface obstructions/utilities cannot be located via a utility or geophysical survey, therefore cannot be identified in advance and can only be identified during investigation implementation. Further, all boring locations will be hand-excavated to at least 3 feet bgs	DTSC staff will be accessible throughout the work plan implementation process. While DTSC may not be available onsite at all times throughout the implementation, communication via telephone and email will be available. DTSC disagrees that approval to relocate borings may cause a delay. It should be noted that the DQOs will address sample locations prior to mobilization. Unfortunately, if PG&E moves forward without DTSC concurrence, and the action is not consistent with the DQOs, then PG&E may be required to perform additional follow up investigations.	While DQOs were utilized to define proposed sample locations, and known accessibility constraints are also reflected in the proposed sample locations, subsurface obstructions may still be encountered. PG&E will work with DTSC to minimize any potential delays associated with the need to relocate sample locations.

Comment No.	2008 DTSC Comment	2010 PG&E Response	2010 DTSC Response	2011 PG&E Response
		for safety reasons, regardless of the results of a utility survey (see response to General Comment 11, above).		
General 13	Please ensure that the laboratory detection limits for polycyclic aromatic hydrocarbons allow for detection in the range of site specific risk assessment goals.	The laboratory reporting limits for PAHS are below all screening levels. Reporting limits and minimum detection limits may increase for certain samples due to potential of matrix interference and/or lack of resolution due to the presence of other organic compounds.	Please ensure that the revised work plan includes language stating that detection limits will strive to the meet the DQOs.	The proposed methods are the same as for the Part A investigation, and detection limits will be similar. Detection limits achieved for the Part A investigations resulted in usable data.
General 14	Based on a review of historical photographs, an additional AOC has been identified in the lower yard near SWMU 5. An apparent round impoundment area with white material is located to the south of the sludge drying beds. The use of this area is not documented. However, oblique aerial photos from 1955 appear to indicate the area was depressed with berms around the edges. This new AOC will be identified as AOC 21 and should be included in the sampling program within the revised work plan. The COPCs are the same as for SWMU 5.	PG&E proposes to investigate this as a newly identified area. Designation of this area as a new AOC will be evaluated once the sampling data are available (during the data evaluation phase).	Designation as an AOC is not contingent upon the findings of the investigation. Please include this area into the workplan, identified as AOC 21, Unidentified Round Impoundment Area, provide historical information and a proposed investigation specific to historic uses in a revised Part B Work Plan. Also see DTSC 2010 Response for DTSC GSU Comment 3 on the 1950s photographs.	This area was added as AOC 21.
General 15	Based on a review of historical information, an additional AOC has been identified in the upper yard east of the Auxiliary Building. A three sided building type structure with no roof appears in historic aerial photographs. Information is required as to the use of this structure to assess the potential effect on the environment. This AOC will be identified as AOC 22, Unidentified Building. Based on the current unknown historic use, the COPCs will include metals, pH, volatile organic compounds (VOCs), total petroleum hydrocarbons (TPH), and semi-volatile organic hydrocarbons (SVOCs).	PG&E proposes to investigate this as a newly identified area. Designation of this area as a new AOC will be evaluated once the sampling data are available (during the data evaluation phase).	Designation as an AOC is not contingent upon the findings of the investigation. Please include this area into the workplan, identified as AOC 22, Unidentified Building, provide historical information and a proposed investigation specific to historic uses in a revised Part B Work Plan. Also see DTSC Response for DTSC GSU Comment 12 on the 1950s photographs.	This area was added as AOC 22.
General 16	Based on a review of historical information, an additional SWMU in need of closure has been identified in the upper yard near the cooling towers. The former bulk sulfuric acid tanks at each of the cooling towers (A and B) will be added as one SWMU (two tanks at 2,600 gallons each). This SWMU will be identified as SWMU 11, Former Bulk Sulfuric Acid Tanks, and should be included in the sampling program within the revised work	These tanks are included within AOCs 5 and 6. Potential metals contamination resulting from sulfuric acid leaks will be evaluated as part of the overall sampling approach for AOCs 5 and 6.	SWMUs and AOCs are not handled the same from a regulatory perspective and will have to undergo a formal regulatory closure process. The former bulk sulfuric acid tanks are considered a SWMU due to their known historic hazardous material handling activities. Please include this new SWMU 11, Former Bulk Sulfuric Acid Tanks, into the work plan and	The sulfuric acid tanks were added as SWMU 11.

Comment No.	2008 DTSC Comment	2010 PG&E Response	2010 DTSC Response	2011 PG&E Response
	plan. The COPCs will include metals and pH.		provide a proposed investigation specific to current and historic uses.	
General 17	More information is requested regarding past operations at the former Water Conditioning Building (currently identified as the "Storage Building") to determine if environmental samples should be collected from this area. Based on current information, sampling is suggested at this building as it is associated with the white powders at the site that can exhibit elevated chromium concentrations. The building was also adjacent and potentially connected to the Process Pump and Precipitation Tanks that yielded green sludge with high metals content during closure. The building has also treated water used in the closed-loop cooling systems.	PG&E does not have any additional information regarding the operations at this building. Water conditioning operations ceased in 1962, and hazardous waste treatment operations began in late 1968 or early 1969, and ceased in 1986. The available information pertaining to the operations that occurred in this building is discussed in the Final RFI/RI Volume 1. This included available information on chemical use and waste generation and management in the water conditioning process. PG&E has no knowledge that the building specifically treated water used in the closed-loop cooling system. Also, based on data collected from Soil Part A, the white powdery material associated with the water conditioning process (lime sludge) contains only low concentrations of metals (i.e., any metals in this material would be due to metals contained in the incoming well water).	PG&E does have knowledge that the building specifically treated water used in the closed-loop cooling system (see page 3-3 of the RFI/RI Volume 1). Based on PG&E's response, significant uncertainty exists regarding the operations at this building. Therefore, characterization of this area is requested to be included in the revised work plan. This area shall be designated as AOC 23, Former Water Conditioning Building. Also see DTSC Response for DTSC GSU Comment 3 on the 1950s photographs.	This area was added as AOC 23.
Specific 1	Section 1.1 – Background The section indicates that the 2007 RFI Volume 1 identifies all areas AOCs and SWMUs. The section should be revised to acknowledge additional units will be identified in a Volume 1 addendum.	Comment noted. The text will be revised to reflect that additional units will be identified in a Volume 1 RFI/RI addendum.	No response necessary.	No response necessary.
Specific 2	Section 3.5 – Step 4 – Study Boundaries When discussing the boundaries of the investigation, the workplan states "… in areas where bedrock is encountered at depths above 10 feet bgs and/or where subsurface utilities are generally absent below 6 feet bgs, the vertical study boundary will be shallower…". The DTSC is unclear as to the rationale for limiting the depth of investigation based on the current absence of deeper utilities in a particular area or due to the occurrence of bedrock. The drilling program should stay focused on the DQO objectives (e.g., nature and extent of contamination, satisfy risk assessment protocol).	Per DTSC request (via an email dated March 22, 2010), all comments pertaining to DQOs and the associated data evaluation (decision) process have been set aside, and no response is required. The Soil Part B DQOs will be redeveloped and presented to Agencies in a Soil Part B DQO Technical Memorandum similar to the Soil Part A Phase 1 DQO TM. A draft of the DQO table and associated decision flowcharts are included with this response to comments.	Revision of the work plan is still necessary to address and clarify this issue. Ultimately, DTSC expects the workplan to be revised in accordance with the DQOs.	The work plan has been prepared in accordance with the DQOs presented in the Soil Part B DQO Technical Memorandum.

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	Revision of the work plan is requested to address this issue.			
Specific 3	Section 3.6 – Step 5 – Decision Rule The intent of the first complete paragraph on page 3-5 of the work plan is unclear and needs to be revised. The paragraph states that upper confidence (95 percent) limits of the mean for each unit of interest will be compared to risk-based thresholds (i.e., CHHSLs/PRGs). The work plan should clearly state that discrete sample data from individual locations will be compared to risk based comparison values and/or background soil concentrations to assess if sufficient data points have been collected to characterize risk and the extent of contamination.	See Response to DTSC Specific Comment 2	DTSC expects the workplan to be revised in accordance with the DQOs.	The work plan has been prepared in accordance with the DQOs; the data evaluation process is described in the Soil Part B DQO Technical Memorandum.
Specific 4	Table 3-1: Summary of Data Quality Objectives • AOC 5 should also be included with AOCs 6, 15, 17, and 19 for deeper sampling due to site history and similarity with AOC 6. • Clarification is requested regarding the intent of the Step 3 comment on cultural resource impacts associated with each remedial technology. It seems that this comment should be dismissed since a remedy has not yet been selected. • Problem 3, Step 4: Target analytes should also highlight and include soil constituents that have potential to impact groundwater. Step 5 should also consider potential for soil to impact groundwater. • Problem 5, Step 5, Decision Rule 5B and 5C: These decision rules imply that if migration pathway can be stopped, then there is no need to assess the extent of contamination from historic migration. This is contrary to Problem 6: Delineation to Characterize the Nature and Extent of COPCs. In practice, PG&E must identify the extent of contamination, define the current risk, then conclude if additional action is warranted, which includes evaluation of possible means of control.	See Response to DTSC Specific Comment 2.	DTSC expects the workplan to be revised in accordance with the DQOs.	The work plan has been prepared in accordance with the DQOs presented in the Soil Part B DQO Technical Memorandum.

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	Under the RFI, PG&E can not and should not limit its investigation because the "migration pathways can be controlled by approved means." The objective of an RFI is to define the nature and extent of contamination, not remedy. • Problem 6, Characterization of the Nature and Extent of COPCs: As identified in previous DTSC comments on Part B DQOs, characterization may require evaluating trends in data (e.g., three samples in linear array) especially where the source of a release is uncertain. The workplan should address this issue.			
Specific 5	Section 4.2.2 – Decision Process for Problem Statement 2 The groundwater recharge rate quoted in the text (<0.1 millimeters per year) does not agree with the findings of the United States Geological Survey (USGS) Water Resources Investigation Report 03-4090 of 2.8 millimeters per year. The sample calculation on page 4-5 does utilize an appropriate conversion (0.1 inches per year). Please ensure that the appropriate value is utilized in presentation of this data. Also, please note that this groundwater recharge rate has not been agreed upon by the DTSC. While the value provides an acceptable starting point, DTSC and other interested parties have not evaluated the USGS report and its applicability to the subject study area.	See Response to DTSC Specific Comment 2.	Response noted; DTSC expects the workplan to be revised in accordance with the DQOs; however, part of the original DTSC comment refers to an error in the units, please ensure that the appropriate value is utilized.	The work plan has been prepared in accordance with the DQOs presented in the Soil Part B DQO Technical Memorandum. The appropriate value will be used in the evaluation.
Specific 6	Section 4.2.6 – Decision Process for Problem Statement 6 Determinations of the adequacy of delineation will be made in concert with DTSC. The DTSC will evaluate the dataset and determine if it is sufficient to adequately demonstrate decreasing concentrations in soil. Further, DTSC and the federal agencies will ultimately determine if data collected as part of any additional soil investigation will affect decisions for the risk assessment or Corrective Measures Study/Feasibility Study.	See Response to DTSC Specific Comment 2.	DTSC expects the workplan to be revised in accordance with the DQOs	The work plan has been prepared in accordance with the DQOs presented in the Soil Part B DQO Technical Memorandum.

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Specific 7	Section 5.3.2 – SWMU 5 – Sludge Drying Beds Review of historical site photos and aerial photos identifies the presence of white material extending beyond the boundaries of SWMU 5. Sampling programs for SWMUs and AOCs adjacent to this SWMU (SWMUs 5 and 9 and Units 4.3, 4.4 and 4.5) should include all of the same COPCs. This is to ensure that releases attributable to SWMU 5 that extended beyond its current boundary are evaluated.	SWMU 5 and units adjacent to this SWMU (SWMU 9, Units 4.3, 4.4, and 4.5) have been previously closed based on inorganic data. Sampling to further evaluate inorganic COPCs at SWMU 5 and units adjacent to it are not warranted. The approved RFI/RI Volume 1 documents the organic COPCs identified by PG&E and the additional COPCs identified by DTSC for these units.	As cited in the original comment, the additional information reviewed by DTSC as part of the Part B work plan evaluation indicates that additional investigation is warranted. Please include the additional COPCs for the SWMU and AOCs identified.	Inorganics analysis has been added to the closed SWMUs.
Specific 8	Section 5.3.2 – SWMU 5 – Sludge Drying Beds Per DTSC's March 29, 2006 letter, the COPCs for this unit shall include Title 22 metals, hexavalent chromium and pH in addition to total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs) and semi-volatile organic compounds SVOCs.	The referenced letter distinguishes between COPCs and constituents requiring further evaluation. The Final Soil Investigation Part B Workplan will be revised to more clearly describe this distinction. Furthermore, the approved RFI/RI Volume 1 documents the organic COPCs identified by PG&E and the additional COPCs identified by DTSC for these units.	The list of COPCs is the inclusive list of constituents expected to be potentially present in each SWMU or AOC. The constituents requiring further evaluation were generated based upon review of existing data. At this point, following the DQO process should yield the same list of compounds (identified in this DTSC comment) which require further evaluation.	Inorganics analysis has been added to the closed SWMUs.
Specific 9	Section 5.3.5 – SWMU 5 – Sludge Drying Beds The proposed boring locations do not adequately characterize the elevated historic COPC concentrations. PG&E should include additional borings to properly characterize the area.	The proposed boring locations and sample depths will be reviewed and adjusted as needed for consistency with the Part B DQOs, once approved by the agencies.	DTSC will review proposed boring locations in a revised workplan to ensure historically elevated concentrations are evaluated.	Per DTSC direction, both organic and inorganic analysis has been proposed in the work plan. However, based on the conceptual site model, historical samples were collected in the appropriate locations and depth. No further sampling for inorganic constituents is merited.
Specific 10	Section 5.4.4 – SWMU 6 – Chromate Reduction Tank Per DTSC's March 29, 2006 letter, the COPCs for this unit shall include Title 22 metals, hexavalent chromium and pH in addition to TPH, VOCs and SVOCs.	See response to Specific Comment 8.	See DTSC's response to Specific Comment 8.	Per DTSC direction, both organic and inorganic analysis has been proposed in the work plan. However, based on the conceptual site model, historical samples were collected in the appropriate locations and depths. The lateral and vertical extents of inorganic constituents have been adequately defined. No further sampling for inorganic constituents is merited.
Specific 11	Section 5.5.4 – SWMU 8 (Unit 4.10) – Process Pump Tank Per DTSC's March 29, 2006 letter, the COPCs for this	See response to Specific Comment 8.	See DTSC's response to Specific Comment 8.	Per DTSC direction, both organic and inorganic analysis has been proposed in the work plan. However, based on the conceptual site model,

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	unit shall include Title 22 metals, hexavalent chromium and pH in addition to TPH, VOCs and SVOCs.			historical samples were collected in the appropriate locations and depths. The lateral and vertical extents of inorganic constituents have been adequately defined. No further sampling for inorganic constituents is merited.
Specific 12	Table 5-7 – SWMU 8 (Unit 4.10) – Process Pump Tank Footnote number 3 states that samples will not be collected at 0.5 to 1 foot bgs due to the previous excavation activities. This statement does not agree with the text in section 5.5.5 regarding sample collection. Due to unknown sources of backfill material during historic remediation activities, samples should be collected at 0.5 to 1 foot bgs related to SWMU 8 and analyzed per the text in section 5.5.5.	The text will be revised as requested by this comment.	No response necessary.	No response necessary.
Specific 13	Section 5.6.1 – SWMU 9 (Unit 4.8) – Transfer Sump The physical description of the tank appears inconsistent with the closure plan, which contains photographs depicting the tank as a box shape rather than the cylinder describe in the text. Please confirm the construction and assess the sampling program to ensure that the existing data and proposed sampling program are adequate.	This unit is closed, and any further sampling will be limited to organic constituents only. Available information regarding tank construction will be rechecked and verified in the Final Part B Work Plan to evaluate whether additional sampling is appropriate.	Limiting the proposed sampling based upon whether the unit was previously closed is not appropriate. Use of the DQO process is necessary to assess the adequacy of the investigation program. Based on the uncertainty in the description of the unit, additional sampling is necessary, including analysis of inorganic constituents. Include additional sampling for this unit.	Per DTSC direction, both organic and inorganic analysis has been proposed in the work plan. However, based on the conceptual site model, the historical sample was collected at the appropriate location and depth (immediately beneath the bottom of the former tank), and the lateral and vertical extents of inorganic constituents have been adequately defined. No further sampling for inorganic constituents is considered merited.
Specific 14	Section 5.6.4 – SWMU 9 (Unit 4.8) – Transfer Sump Per DTSC’s March 29, 2006 letter, the COPCs for this unit shall include Title 22 metals, hexavalent chromium and pH in addition to TPH, VOCs and SVOCs.	See response to Specific Comment 8.	See DTSC’s response to Specific Comment 8.	See response to Specific Comment 13.
Specific 15	Section 5.7.3 – AOC 5 – Cooling Tower A The proposed boring locations do not adequately characterize the elevated historic COPC concentrations. PG&E should include additional borings to provide proper lateral and vertical characterization of the area. Additionally, potential contaminant source material may exist below the cooling tower structures and will not be	The proposed boring locations and sample depths will be reviewed and adjusted as needed for consistency with the Part B DQOs. . All proposed locations will be evaluated based on access limitations and safety concerns. An assessment of conditions beneath the cooling towers will be	Include an evaluation of areas where limited or no sampling can be performed in the revised Part B work plan.	A detailed accessibility evaluation was conducted as part of the work plan preparation process and is documented in Appendix B. Proposed sample locations were determined based on the Part B DQOs evaluation and accessibility constraints.

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	evaluated based on the proposed sampling program. PG&E should evaluate methodologies, including angle borings, to assess beneath the cooling towers.	attempted only if it is feasible and safe.		
Specific 16	Figures 5-5 and 5-6 – AOC 5 – Cooling Tower A • The figures should be revised to depict: • location of the historic chemical storage shed • location of the identified stained soil • identify current and historic unpaved areas	The document will be revised to reflect this comment.	No response necessary.	No response necessary.
Specific 17	Figure 5-6 – AOC 5 Cooling Tower A Additional soil boring locations are required to more adequately characterize this area. The previously identified elevated chromium concentrations should be defined in both lateral and vertical directions. Please revise the proposed sampling program for AOC 5 to provide adequate lateral coverage.	See response to Specific Comment 15.	The work plan should be revised to address the DTSC Comment. Also see DTSC's response to Specific Comment 15	See response to Specific Comment 15.
Specific 18	Section 5.8.4 – AOC 6 – Cooling Tower B The proposed boring locations do not adequately characterize the elevated historic COPC concentrations. PG&E should include additional borings to properly characterize the area. Additional lateral coverage is warranted surrounding the tower. Potential source material may exist below the cooling tower structures and will not be evaluated based on the proposed samples. PG&E should also evaluate methodologies, including angle borings, to assess beneath the cooling towers.	See response to Specific Comment 15.	The work plan should be revised to address the DTSC Comment. Also see DTSC's response to Specific Comment 15.	See response to Specific Comment 15.
Specific 19	Figures 5-7 and 5-8 – AOC 6 – Cooling Tower B • The figures should be revised to depict: • location of the historic chemical storage shed • identify current and historic unpaved areas	The document will be revised to reflect this comment.	No response necessary.	No response necessary.

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Specific 20	Section 5.9.7 – AOC 7 and AOC 8 – Hazardous Materials Storage Area and Paint Locker Based on historical data, the current maintenance building was formerly used as the chemical storage building. This area should be investigated as part of AOC 7. Please include borings inside and around the maintenance building to address the historic chemical materials storage use.	The proposed boring locations and sample depths will be reviewed and adjusted as needed for consistency with the Part B DQOs.	This is a known data gap that should be addressed as part of the revised Part B work plan.	The footprint of AOC 7 was expanded as requested. See also response to Specific Comment 15.
Specific 21	Section 5.9.7 – AOC 7 and AOC 8 – Hazardous Materials Storage Area and Paint Locker Although the alluvium/bedrock contact is anticipated to be shallow (less than 10 feet) in this area, the collection of a soil sample at 10 feet bgs should be included in the sampling program. The soil sampling program should not be limited prior to field mobilization based on expectations. If the actual depth to bedrock precludes collection of a soil sample at 10 feet bgs, comments should be included in the RFI Report. However, if sampling is possible, the data should be collected and reported in the report. Also see General Comment 4.	The proposed boring locations and sample depths will be reviewed and adjusted as needed for consistency with the Part B DQOs.	This is a known data gap that should be addressed as part of the revised Part B work plan.	See response to Specific Comment 15.
Specific 22	Table 5-16 - AOC 13 – Unpaved Areas within the Fence Line The data category of the historic data should be confirmed. Some of the samples appear to indicate inconsistent notes (i.e., BGCS-2 at 0.5 feet is identified as Category 2, but BGCS-2 at 1 foot is identified as Category 1). Please confirm the sample data category and revise the table as necessary. Pages 5, 6, and 7 of Table 5-16 list samples, but the associated data have not been presented on the table. The table should be revised to address this issue. Text on page 5-28 indicates that two spill samples detected polychlorinated biphenyls (PCBs), yet the data contained Table 5-17 does not support this statement. Appropriate revisions should be made to the work plan to reconcile this discrepancy.	The data categories will be confirmed and the table revised as necessary.	No response necessary.	No response necessary.

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Specific 23	Figure 5-14 – AOC 13 – Unpaved Areas Within the Fence Line Additional rationale should be provided in the text and tables for the proposed sampling program. DTSC acknowledges the grid type sampling proposed (particularly in the lower yard), however, historic leaks, spills, drainages, low points, etc., should be preferentially sampled as well.	The proposed boring locations and sample depths will be reviewed and adjusted as needed for consistency with the Part B DQOs.	This comment requested sampling rationale for samples to be collected within AOC 13 which should be provided as part of a revised Part B work plan.	Comment noted.
Specific 24	Section 5.11 – AOC 15 – Auxiliary Jacket Cooling Water Pumps In order for DTSC to fully assess the proposed sampling program, AOC 15 should be better described, including photographs, to illustrate unit configuration (e.g., illustrate pump and valve seals that have leaked in the past), surface drainage directions/low points, and relationships to trenches, storm drains, and historic data. Formerly unpaved areas mentioned in Section 5.11.1 should also be delineated on figures and samples should be proposed in the unpaved areas where releases from the unit would have traveled.	PG&E will redraw this figure to more clearly show the locations of pipelines and other nearby obstructions. PG&E will identify accessible and inaccessible areas on the figure for this AOC and provide the requested photographs. Specific information regarding which pump seals leaked is not available. The entire site, except the roads, was previously unpaved. All pumps are located within a small, contiguous area on an elevated pad. The area underneath pumps is covered by gravel as are the adjacent areas to the east and west.	No response necessary.	No response necessary.
Specific 25	Figure 5-15 and 5-16 – AOC 15 - Auxiliary Jacket Cooling Water Pumps The historic sample locations identified with green dots on Figures 5-15 and 5-16 are not plotted in the same locations on each figure and require confirmation of the true sample location. Additionally, the pipe trench and storm drain identified in Section 5.11.1 are not identified on either figure and should be added. The figures will need to be revised to properly address these issues.	To the degree this information is available, the figures will be revised to address these issues.	Ensure that various figures depicting the same boring location agree in location in figures submitted as part of the revised Part B work plan.	The figures have been made consistent.
Specific 26	Figure 5-16 – AOC 15 - Auxiliary Jacket Cooling Water Pumps Additional sample locations appear warranted based on the existing information presented in the text. The five historic samples with chromium exceeding industrial screening criteria are not adequately bounded with step out borings. Sampling along the pipe trench and storm	The proposed boring locations and sample depths will be reviewed and adjusted as needed for consistency with the Part B DQOs.	This is a known data gap that should be addressed as part of the revised Part B work plan.	AOC 15 is in a different location than the actual auxiliary jacket water coolers which were reported to have leaked. The auxiliary jacket water coolers are adjacent to the Auxiliary Building. The pipe trench and drain will be evaluated as part of the storm drain investigation program. See also response to

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	drain appears warranted, as leaks from AOC 15 have been documented to have entered these structures. The proposed sampling plan should be revised to address these issues			Specific Comment 15.
Specific 27	Section 5.12.1 – AOC 16 – Sandblast Shelter Additional information is required related to the age of the sandblast shelter. Please provide an approximate date when the feature was installed. Further, discuss where similar operations were conducted prior to construction of the sandblast shelter.	The sandblast shelter was installed in about 1995. Some sandblasting activity had occurred in this area in the past. As described in the RFI/RI, however, sandblasting also occurred in situ, as much of the painted equipment at Topock cannot be moved. The age of the sandblast shelter will be added to description of this unit in the workplan.	Include COCs associated with sandblasting activity to all AOCs/SWMUs in which the activity was conducted as part of the revised Part B work plan. Please identify where similar operations were conducted prior to construction of the 1995 sandblast shelter, and evaluate these areas for characterization.	Title 22 metals are the COPCs associated with sandblasting and are included in all sample analyses proposed for the Part B investigation. Prior to 1995, ex situ sand blast activities occurred in the same area as the sand blast shelter.
Specific 28	Section 5.12.1 – AOC 16 – Sandblast Shelter Additional information is required as to the abrasive materials used at the sandblast shelter. During recent site visits to the area, at least two distinct materials were present. One light colored and one dark colored. The composition of each and potential effect on the environment should be presented in the background information for this unit.	These questions will be researched and if this information is available in existing reports, it will be added to the revised work plan.	DTSC awaits PG&E's response.	Two types of sand blast material have typically been used in the past several years: KleenBlast and Monterey 30 Mesh. , PG&E has not found any historical Topock-specific records regarding the use of sand blast grit. Information regarding the two types of sand blast grit has been included in the work plan.
Specific 29	Section 5.12.4 – AOC 16 – Sandblast Shelter The actual soil surface with sandblast grit should be sampled. For this AOC, the 0.5 to 1 foot samples proposed should be revised to true surface samples collected from the soil sandblast grit mixture on the surface. This is requested to address potential risk associated with loose surface material that may be more accessible and more easily transported via wind or storm events.	The proposed boring locations and sample depths will be reviewed and adjusted as needed for consistency with the Part B DQOs.	This is a known data gap that should be addressed as part of the revised Part B work plan.	Four surface soil samples total will be collected from the areas with apparent sand blast grit. Three of the samples will be collected from the 0.0 to 0.5-foot interval in association with the previously proposed sample locations; a fourth surface (0.0 – 0.5 foot bgs) sample was added to further assess the constituents potentially present in the sand blast grit.
Specific 30	Section 5.13.1 – AOC 17 – Onsite Septic System A geophysical survey or other technique should be conducted to establish the actual location of the subsurface leach lines. A single historic source of a hand drawn sketch does not provide the certainty necessary to conduct a useful investigation. Please	Comment noted. A geophysical survey will be performed in an attempt to more precisely locate the septic system leach field.	No response necessary.	No response necessary.

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	provide for the more precise location of the septic system leach field.			
Specific 31	Section 5.14.1 – AOC 18 - Combined Wastewater Transference Pipeline Additional information is required to describe the pathway of the waste water pipelines related to Cooling Towers A and B. The wastewater pipelines from the towers do not appear to be described in the text or identified on figures. Please provide a discussion and route of the pipelines. Additional piping layout from the 1990 Closure Plan and 2004 RFI Report should be incorporated into the work plan.	This information will be provided where available but available pipeline information is limited and schematic.	In the absence of a known location of piping, an expanded investigation program may be necessary to properly evaluate this AOC. A pipeline location survey may also need to be conducted.	Additional information regarding the pipelines was added to the work plan.
Specific 32	Section 5.14.1 – AOC 18 - Combined Wastewater Transference Pipeline Pages 5-35 and 5-36 of the work plan discussing the letter / number designation of pipelines (pipe sections A to H) are confusing. A figure similar to that presented in the 1990 Closure Plan or 2007 RFI, Volume 1 should be used to link the pipeline designations to site locations. Pages 5-35 and 5-36 indicate that Pipeline H is vitrified clay pipe, yet Table 5-28 indicates that it is cast iron. This discrepancy should be resolved.	A figure equivalent to those referenced will be included in the workplan. The discrepancy in pipe materials will be researched, and any additional or more definitive information found will be added to the revised work plan.	DTSC awaits PG&E’s response.	A figure similar to the 2007 RFI has been added to the work plan. In addition, most of pipeline H was vitrified clay; the first 60 feet of H-1 were cast iron. The information about pipeline H has been added to the work plan.
Specific 33	Section 5.14.1 – AOC 18 - Combined Wastewater Transference Pipeline The original rationale for sample collection during closure should be evaluated. That evaluation should be taken into account when proposing additional investigation to ensure that the AOC is properly characterized. Additionally, elevated concentrations at PH-2 should be further characterized to determine the extent of contamination.	The rationale for sampling during closure is discussed in Section 5.14.3. The sample locations targeted points along the pipelines with the highest likelihood of a release based on results of pressure testing, locations of valves and joints, and visual evidence of leaking (e.g., visibly stained soils). Soil found during the closure activities to be impacted was removed during the pipeline closure work, as documented in the closure report, the 2005 RFI/RI and the Final RFI/RI Volume 1. This information was taken into account in the work plan.	This is a known data gap that should be addressed as part of the revised Part B work plan.	All samples associated with AOC 18 were collected from beneath pipelines. The majority of the pipelines were uncovered and removed. Impacted soils were then removed, and confirmation samples were collected after removal of impacted soil. Another location has been added in the vicinity of AOC18-2 to address this request. Samples associated with Units 4.3 – 4.5, SWMU 5, and AOC 21 will also provide information on the possible nature and extent of contamination associated with location PH-2.

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Specific 34	Section 5.14.1 – AOC 18 - Combined Wastewater Transference Pipeline Sampling should be conducted on the "outlet" side of the wastewater treatment system. Historic sampling has all occurred on the "inlet" side of the units. For the purposes of the Part B Workplan, samples should be collected from the units to the fence line.	The outlet side of the wastewater treatment system was Bat Cave Wash (i.e., a pipeline discharged directly to Bat Cave Wash, as is visible in Figure 3-14 of the Final Volume 1 RFI). The area in Bat Cave Wash beneath the discharge pipe location is within the boundary of SWMU1, and has been extensively sampled. The proposed boring locations and sample depths will be reviewed and adjusted as needed for consistency with the Part B DQOs.	PG&E needs to adequately respond to the comment. The area between the wastewater treatment system and the fenceline is a known data gap that should be addressed as part of the revised Part B work plan.	Three sample locations AOC 13-29, AOC18-10, and AOC18-11 are proposed in the area between the waste water treatment system and the fence line.
Specific 35	Figure 5-20 and 5-21 – AOC 18 - Combined Wastewater Transference Pipeline The method of differentiation between removed pipelines and in place pipelines should be revised. The text provides discussion of the pipe removal and sampling program; however, for ease of evaluation, distinction should be made visually as well on the figures.	The figures will be revised.	No response necessary.	No response necessary.
Specific 36	Section 5.14.4 – AOC 18 - Combined Wastewater Transference Pipeline An effort should be made to ensure existing sample data is adequate in areas where previous pipe removal operations identified stained soil or soil was removed. Some data does exist for these pipelines, however, it is not clear if an evaluation has been made on the adequacy of the dataset. Please provide detailed justification for omitting specific samples in areas previously identified as impacted.	The proposed boring locations and sample depths will be reviewed and adjusted as needed for consistency with the Part B DQOs.	Please note that additional boring locations may be necessary.	Comment noted.
Specific 37	Section 5.14.4 – AOC 18 - Combined Wastewater Transference Pipeline The section indicates that the pipelines were below-grade structures. The depths of the lines will need to be disclosed to ensure appropriate sample horizons are selected for characterization. If the depths or locations of the pipelines are uncertain, then trenching should be considered to adequately locate sample points relative to a pipeline.	The closure reports indicate that sampling occurred below some pipes and joints. Some (but not all) depths are provided in the reports and will be included in a table in the workplan. This available information was considered when establishing proposed sampling depths. Additional assessment of pipeline depths will be evaluated and if feasible, will be proposed in the revised work plan.	Manual excavation of pipelines may be necessary to uncover pipelines and ensure that samples are collected at appropriate depths.	All samples associated with AOC 18 were collected from beneath pipelines or were confirmation samples collected after removal of impacted soil. Depths are shown on Table B15-2. None of the samples were collected beneath 6 feet bgs, indicating all pipelines and subsequent excavations were in the top 6 feet. Based on the information in the transference pipeline closure report (Mittlehauser, 1990), all pipes were installed above – 6 feet. A detailed

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				accessibility evaluation was conducted as part of the work plan preparation process and is documented in Appendix B. Proposed sample locations were determined based on the Part B DQOs evaluation and accessibility constraints. Manual excavation of the pipelines was not proposed in the work pan.
Specific 38	Table 5-27 – AOC 18 - Combined Wastewater Transference Pipeline It is unclear whether the single asterisk referring to sample collection after soil removal applies to this table. Please confirm the applicability of the single asterisk for this table.	This information will be revised in the work plan.	No response necessary.	No response necessary.
Specific 39	Table 5-30 – AOC 19 - Former Cooling Liquid Area Page 5-40 and Table 5-30 of the work plan indicate that all seven AOC 19 samples are Category 2. Specific deficiencies and limitations of the seven Category 2 samples should be stated in this section of the work plan to allow assessment on how the data can be used. In general, additional samples would be warranted if the existing Category 2 data have significant deficiencies.	To avoid redundancy, PG&E chose to not restate the limitations on data use for each investigation area. PG&E will prepare a table with this information per the response to General Comment #8.	No response necessary.	No response necessary.
Specific 40	Figures 5-22 and 5-23 – AOC 19 - Former Cooling Liquid Area The proposed sampling plan cannot be adequately evaluated without an accurate depiction of the AOC. Revised or additional figures are requested at appropriate scales so that site features and sample locations can be accurately depicted (e.g., at a scale similar to Figure 5-15). Currently, site features are not illustrated and historic boring locations overlap one another. At a minimum, the figure(s) should identify: the former Hot Well; Jacket Cooling Water (JCW) tanks; JCW pumps and valves (especially ones that have leaked); the former cooling additive mixing shed/current pad; unpaved areas; the two current 1,426 gallon above ground reusable engine oil tanks; the three existing	PG&E will provide a more detailed figure to show placement of pipelines and other obstructions, and include available information regarding the former locations of various features. Known underground piping will be shown in the figure, however, other underground piping may be present as well. Photographs will also be included in the workplan..	No response necessary.	No response necessary.

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	above ground chemical storage tanks (one 200 gallons and two 400 gallons); underground and aboveground piping; surface drainage directions and depressions; and potential or known routes of former releases and leaks especially ones that would travel to the visitors parking lot/warehouse and down the main entrance road. Photographs of the AOC are also suggested.			
Specific 41	AOC 19 - Former Cooling Liquid Area The proposed sampling plan appears focused on the eyewash pad (see the "Description" column on Table 5-31) and not the other units within the area (see comment above). Certainly, samples from around and beneath the Hot Well and around leak areas are warranted. Based on evaluation of Figure 5-22 and 5-23, additional samples east of the AOC appear warranted to bound eastward contamination and to characterize documented releases towards the visitors parking lot, warehouse, and entrance road.	The proposed boring locations and sample depths will be reviewed and adjusted as needed for consistency with the Part B DQOs.	This is a known data gap which should be addressed as part of the revised Part B work plan.	Samples have been added in the vicinity of the hot well. See also response to Specific Comment 15.
Specific 42	AOC 19 - Former Cooling Liquid Area Section 5.15.2 - Summary of Soil Characterization: The first paragraph discusses results of a Hot Well cleanup project. The work plan should include a table of all Hot Well cleanup sampling data from this particular project including the Title 22 metals for the greenish liquid sample discussed in the second paragraph of section 5.15.2. If a Hot Well cleanup document exists, it should be provided to DTSC. The first paragraph of section 5.15.2 also inappropriately refers to Figure 5-22 regarding the Hot Well cleanup data. This should be corrected in the revised work plan.	The hotwell closure report will be provided to DTSC. Most of the hot well cleanup data pertain to disposal characterization. The hot wells were removed and the sampling and clean up were focused on remnants of the hot well that were to be disposed of, i.e., concrete from the former hot well and sediments contained within the remnant hot well. No data were collected outside of the hot well footprint. It should be noted that most of the requested information is provided in the Final RFI/RI Volume 1. The text will be corrected.	DTSC awaits PG&E's submittal of the closure report.	The Hotwell Closure Report was submitted to DTSC on May 3, 2011
Specific 43	AOC 19 - Former Cooling Liquid Area The section mentions darkly stained concrete and concrete with elevated chromium that has exceeded hazardous waste criteria. PG&E should indicate how stained concrete and asphalt will be managed and if it plans to characterize the stained materials during this investigation. If so, the work plan should be modified	To prevent access to the affected area, PG&E has covered the stained concrete as described in the workplan. There is no asphalt located in the AOC 19 footprint; asphalt is present in plant roads east and west of AOC 19. There is no visible staining emanating from AOC 19 onto this asphalt. PG&E is planning to conduct additional characterization	No response necessary.	No response necessary.

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	accordingly.	to determine whether the remainder of the concrete exceeds hazardous waste criteria, and is currently evaluating the feasibility of removing the pad. If feasible, PG&E will seek DTSC's permission to remove the pad.		
Specific 44	Section 5.16.1 – AOC 20 - Industrial Floor Drains The last paragraph of this section should indicate that approximately 220,000 gallons a year of oily waste water is transmitted through the floor drain system. The section could be misread to suggest the floor drains only collect incidental drips and spills and occasional floor washing liquids.	The work plan will be revised to clarify this information. It should be noted that this equates to a very low flow system (220,000 gallons per year implies an average flow of 0.4 gpm from all sources combined).	No additional response necessary. It should be noted that 220,000 gallons per year is substantial and over the course of several years the cumulative total would be in the millions of gallons.	No response necessary.
Specific 45	Section 5.16.3 – AOC 20 - Industrial Floor Drains Per DTSC's May 9, 2007 letter, the COPCs for this unit shall include PCBs in addition to Title 22 metals, hexavalent chromium, TPH, VOCs and polycyclic aromatic hydrocarbons.	Comment Noted, PCBs will be added to the analyte list for AOC 20.	No response necessary.	No response necessary.
Specific 46	Section 5.16.3 – AOC 20 - Industrial Floor Drains The section indicates that the floor drains are primarily below-grade structures located at varying depths. The depths of the drain lines will need to be disclosed to ensure appropriate sample horizons are selected for characterization.	The depths of most of the oily water lines are not known. Because sampling will be occurring in the immediate vicinity of a subsurface utility, hand excavation will be required until the lines are physically encountered, to ensure that the lines are not damaged by the sampling effort. Thus, although the general requirement is to hand excavate to a minimum depth of 3 feet bgs, hand-digging will be required to the oily water line depth(s) at AOC 20.	No response necessary.	No response necessary.
Specific 47	Figure 5-24 – AOC 20 – Industrial Floor Drains To ensure appropriate sample coverage for this feature, soil boring locations should be placed at approximately 100 foot centers along pipe runs and at each angle joint. Please revise the proposed boring locations to adequately address lateral coverage.	The proposed boring locations and sample depths will be reviewed and adjusted as needed for consistency with the Part B DQOs.	The work plan should be revised to address the DTSC Comment.	See response to Specific Comment 15.
Specific 48	Section 5.18 – Monitoring Well Installation Area 1: If unsaturated alluvial conditions are encountered in the first borehole proposed in the area,	Per DOI and DTSC's direction on February 24, 2010 (*PG&E Topock Compressor Station Remediation Site – Groundwater Characterization Requirements for the East Ravine and Compressor Station Areas*),	The proposed groundwater monitoring investigation is no longer contained within the Part B soils investigation work plan and is being addressed as a separate groundwater	No response necessary.

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	then PG&E should contact DTSC for direction on whether a new borehole should be drilled to the north/northwest. DTSC may direct PG&E to complete the well in the shallow portion of the conglomerate in lieu of drilling an additional borehole depending on the proximity to the water table and the character of the conglomerate. While unlikely, if the alluvial sequence is much larger than anticipated, DTSC may require a shallow and deep well be completed in this area. Area 2: If the alluvial sequence is larger than anticipated, DTSC may require a shallow and deep well be completed in this area. While unlikely, if significant saturated alluvial materials are encountered in Area 2, DTSC may direct PG&E to install a well further south closer to potential source areas (e.g., AOC 19). Area 3: To be consistent with the hydrogeologic characterization methodology used over the entire site, a shallow, middle, and lower well is requested for this area provided that the anticipated thickness of the saturated alluvial material is encountered in Area 3. Additionally, the work plan should include soil sample collection and analyses (for both COPCs and various soil parameters) from the deeper zones during borehole drilling for these wells.	groundwater investigation inside the compressor station will be combined with additional characterization at the East Ravine area. Therefore, no response to this comment will be provided in the Part B Soil Investigation Work Plan.	investigation.	
Specific 49	Section 6.3.1 – Monitoring Well Installation, Drilling requirements Borehole diameters should not be limited to eight inches in diameter. Nested wells will require, at a minimum, a 10-inch diameter borehole to allow emplacement of sufficiently thick annular seals. The text should be revised accordingly.	See response to Specific Comment 48.	See DTSC's response to Specific Comment 48.	No response necessary.
Specific 50	Section 6.3.3 – Depth-specific Groundwater Sampling When running chromium confirmation samples on Isoflow® samples at certified laboratories, hexavalent chromium should also be conducted as the 24-hour holding time should no longer be an issue due to	See response to Specific Comment 48.	See DTSC's response to Specific Comment 48.	No response necessary.

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	updated analytical methodologies.			
Specific 51	Section 6.3.4.1 – Monitoring Well Specifications Although the text specifies 2-inch Schedule 40 polyvinyl chloride (PVC) casing for wells less than 300 feet, DTSC may require alternative well construction materials based on site specific conditions.	See response to Specific Comment 48.	See DTSC's response to Specific Comment 48.	No response necessary.
Specific 52	Section 6.3.4.5 – Casing Grout Specifications As indicated in previous DTSC correspondence, Type I Portland cement is not recommended due to elevated sulfate concentrations on site. A Type II or V cement is necessary.	See response to Specific Comment 48.	See DTSC's response to Specific Comment 48.	No response necessary.
Specific 53	Section 6.3.6 – Well Completion Diagrams Please also include the borehole diameter on well completion diagrams.	See response to Specific Comment 48.	See DTSC's response to Specific Comment 48.	No response necessary.
Specific 54	Figure 6-3 The figure should be revised to incorporate the minimum 10-inch diameter borehole requirement previously discussed for nested wells.	See response to Specific Comment 48.	See DTSC's response to Specific Comment 48.	No response necessary.

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1	Photographs identified as PG 153, PG 154, PG 160, and PG 161 from the Photo File reveal what the GSU presumes is an aboveground wastewater clarifier within the lower yard of the compressor station. The figure below (PG 153) illustrates the clarifier within the northern scrubber area. This figure shows dark staining on the sides of the clarifier and in soils down slope of the unit. Figure 3-15 from RFI – Volume 1 (attached) illustrates prominent soil staining associated with this unit at least 40 to 50 feet in length. PG&E will need to identify the unit, and discuss its operation and closure as it is not described in the RFI – Volume 1 (CH2M HILL, 2007). Soil sampling below and around this unit is recommended due to observed releases.	This unit is most likely an API Oil/Water separator. The pipe exiting the bottom of the hill lines up with the routing of the current and historic oily water piping. It is possible that this OWS location preceded the known (current) OWS location. In 1958 or 1959, the three scrubbers shown in the photo were expanded to a bank of six scrubbers. The northern-most current scrubber appears to be located approximately where this OWS was formerly located. The existing workplan calls for two samples in this area. PG&E will increase the AOC 13 sample density by two sample locations in this area to address this concern.	PG&E has failed to properly identify this unit that has obviously released wastes to the environment. DTSC must now direct PG&E to include this unit as a separate AOC – AOC 24, Former Oil/Water Separator. Based on the limited input from PG&E, this AOC shall be identified as the “Former Oil/Water Separator” and will require evaluation and sampling as a unique AOC. It is not to be included as part of AOC-13 (Unpaved Areas at the Compressor Station) as it is a unique unit with documented releases. PG&E is again directed to gather more information on this unit and submit it to agencies as soon as possible including its operation and closure. Description of AOC 24, Former Oil/Water Separator shall also be included in the RFI – Volume 1 Addendum. PG&E needs to accurately locate and map the former OWS as well as the documented releases that emanated from the unit. Photograph PG 160-4 illustrates that the unit was located just north of the trench for the “scrubber inlet header”. PG&E must note that the unit is located some distance away from the bank of scrubbers. All six scrubber header lines (including the stubs of yet to be installed scrubbers) can be seen in PG 154. Figure 3-15 from the RFI – Volume 1 also illustrates the relative location of the unit and associated soil staining. The total number of samples needed for this unit will be based upon locating the unit with certainty. Trenching / potholing is also requested to find and track soil staining away from the unit. Additional sample locations and trenching are needed based on the minimal information provided by PG&E.	This unit and the associated staining were added as AOC 24. Available information was included in the work plan. Given the available photographic information PG&E does not believe that trenching or potholing is required to accurately locate potential sampling points.
2	The Photo File contains photographs (PG 154 – Photos 4 and 5) that exhibit discolored soil in the lower yard northern scrubber area. Photo 4 (PG 154) exhibits dark stained soil in a small area just north of the scrubbers (see red oval on the next page). This same area still exhibits stained soil one year later as illustrated in Figures 3-14 and 3-15 from RFI – Volume 1 (CH2M HILL, 2007). Photo 5 (PG 154) exhibits darkened soil around the northern scrubber unit with the majority of the darkened area south of the unit (see photo on next page).	The staining by the pole mentioned in this comment is apparent in Photo 4 and the 1995 aerial photos, but does not appear in Photo 5. The bigger staining is apparent only in Photo 5. This indicates that the “staining” in Photo 5 was of very short duration. It also appears that significant grading has occurred between the times associated with Photos 4 and 5; it is likely that the larger “staining” is water used to condition the soil and control dust during grading and/or aid in compaction of the soils. The smaller stain may be associated with the oil bath filters that were formerly part of the scrubbers. The proposed boring locations and sample depths	PG&E needs to describe the oil bath filter process that is suggested for causing the smaller soil staining noted in the comment. Samples will need to occur at this area (Photo 154-4) after an understanding of the process is documented by PG&E. No samples are currently proposed for this area. This stained area should be accurately located on a map/figure to aid in site characterization. Characterization is warranted as the staining noted in this area persisted for at least a years time and can be noted from aerial observations. Samples of the darkened soils from the groomed area in Photo 154-5 area are requested to ensure waste oil or other similar fluid was not used to prepare the site. No	Samples have been added in AOC 13 to address the larger discolored area, and the smaller stained area.

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	Soil sampling within the areas of discolored or darkened soil is recommended due to potential contamination associated with the discolored soils.	will be reviewed and adjusted as needed for consistency with the Part B DQOs.	samples are currently proposed for this area. PG&E should document that a portion of the darkened soil is still visible a year later in 1955 aerial photographs (Figure 5-13 and 5-14). Please note that photographs on the adjacent oil/water separator indicate that waste oil is being collected in a container and, therefore, could have been utilized for preparing or maintaining site soils.	
3	Photo 5 (PG 154) also pictures the white colored sludge drying beds in the background. Another white area and probable impoundment is located beyond the sludge drying bed in Photo 5 (PG 154). Figures 3-14 and 3-15 from RFI – Volume 1 (CH2M HILL, 2007) also illustrate this second white area. Soil sampling within the second white area is recommended due to potential contamination associated with the white material. PG&E should document the operation and any closure associated with this unit adjacent to the sludge drying beds.	This white area is described in Volume 1 of the RFI/RI. At the time of the aerial photo review for the RFI/RI, it was interpreted to be a mound of white material. It is important to distinguish between the two types of sludge that were dried in the sludge drying beds: lime softener sludge and hazardous waste treatment system sludge. The material in this area is most likely lime softener sludge from the plant water conditioning system. Until 1962, Topock used the Permutit® system to remove excess minerals from the plant water, and dried the sludge associated with this process in the sludge drying beds. As shown from the sampling conducted in AOC 14 (which received lime softener sludge), concentrations of Cr(T) and Cr(VI) in the softener sludge are low (well below industrial CHHSLs/PRGs). Because 2-phase treatment of the chromium-containing waste water did not begin until late 1968 or early 1969, it is not possible for the material in the photographs to be hazardous waste treatment system sludge. As reported in the RFI/RI Volume 1, lime softener sludge from the water conditioning system was transported to AOC 14 and sprayed on the ground for disposal. It is likely that the round area served as an interim storage area for the sludge. There is no record of any “secondary storage” associated with the hazardous waste treatment system. Because of the site history information described above, this area was not identified in the Final RFI/RI Volume 1 as a unit specifically requiring investigation.	PG&E cannot say with any certainty if the white sludge formerly located south of SWMU 5: Former Sludge Drying Beds is not contaminated. Please note that white powder sampled from AOC 14: Railroad Debris Site does contain elevated concentrations of hexavalent chromium. In fact, it exhibits the highest hexavalent chromium of all the 2008 AOC 14 soil samples. Additionally, other white powders sampled from both Bat Cave Wash and the East Ravine contain significantly elevated chromium concentrations. Therefore, soil sampling within this white area is warranted (see General Comment 14). The Final RFI/RI Volume 1 only briefly discusses this white area. Figure 3-14 from RFI – Volume 1 (CH2M HILL, 2007) clearly shows that the unit is a bermed, bowl-like, impoundment. PG&E should respond to the original comment and document the operation and any closure associated with this former unit.	This area was added as AOC 21. Available information was incorporated into the work plan.

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4	The Photo File contains two photographs (PG 40 – Photo 5 and PG 41 – Photo 1) that are titled “Cleaning interior of engine with solvent spray.” As illustrated below, the photos show the large compressor engines being cleaned with a jet spray system. PG&E should attempt to determine how often this cleaning was performed and what type of solvent was used. These photographs appear to contradict the RFI – Volume 1 (CH2M HILL, 2007) which indicates that solvent use was only incidental and used in small quantities.	The standard practice during operations was to steam clean the exterior of the compressor engines. The referenced activity is part of the construction effort to remove a protective coating. The compressor engines typically were shipped to the station with a protective coating to prevent damage during transport after manufacture and before operation. There is no information from any former employees indicating that solvent spraying was a standard means of cleaning the compressor engines when the plant was in operation, and actually was prohibited by PG&E safety rules. Thus, this solvent cleaning was likely a one-time occurrence following the original installation of the compressor engines.	DTSC requests that PG&E fully respond to the comment by indicating what type of solvent was used and an estimate of the total volume that would have been used to clean one engine. Also describe how the solvents were disposed (e.g., Did they flow to the sump below the engine?).	There are no records regarding the precise type or volume of solvent used. Collection or management of solvents after spraying/use is unknown. VOC analysis is proposed at SWMUs 5, 6, 8, and 9, and AOCs 7, 8, 13, 17, 18, 20, 22, 23, 24, and 26, and Units 4.3. In addition, 10 percent of all samples on the station are being analyzed for TAL/TCL compounds, which includes VOCs; thus if any VOCs were released during this activity, they will be identified through the sampling program.
5	The Photo File contains several photographs (PG 110, 111, 164, 165, and 167) of gas headers being forcefully purged as illustrated below in PG 165 – Photo 1. PG&E should describe the purging operation including why and how the purging is conducted, how often it was/is done, and what fluids were injected/ejected during the process.	The purging of the lines depicted in this photo was done to remove all air and water from the lines prior to moving natural gas through the lines. Pipes were tested for leaks by filling them with water and pressurizing them. This was and continues to be the standard practice every time modifications are made to piping. The reason that the purging appears to discharge a waste material is because the high pressure and velocity during the purging aerosolize any water released, and the moisture contained in air purged from the pipelines is frozen due to the sudden decompression as it exits the pipeline. The purged material is always forced upward, because it is highly pressurized. Due to the high pressure and speed of the purged material, it would represent a significant danger to people if it where to hit somebody. If the line being purged was previously in use, the purged material could have contained small amounts of pipeline liquids. Although any associated impacts to the Topock Compressor Station are unlikely, they would be addressed by the sampling already proposed for AOC 13.	To complete the response, PG&E should indicate how often this practice is conducted and if it is done in specific areas.	This practice is infrequent during new construction to remove all air and water from the lines prior to moving natural gas through the lines. This type of purging has occurred an estimated five to 10 times since the start of station operations. Exact locations of these purges are unknown, but would be unique to each time a section of pipeline was repaired or constructed. In addition, pipeline purging or “blowing down” is also done as part of the compressor station operation and maintenance. These blow-downs occur several times a year at fixed stack-pipes for plant safety and maintenance.
6	The Photo File contains several photographs of transformers mounted to twin telephone poles (PG 18, 19, 126, 156, 157, and 163). It is assumed that these transformers would have used polychlorinated biphenyls (PCBs).	PCBs will be added to the analyte list for those AOCs where used transformers or used oil may have been stored or in exposed areas where oil may have been applied to the ground surface. As previously documented in the March 1, 2006 memorandum to DTSC (entitled *Background*	PG&E should document where PCB use and disposal occurred on the site in light of detecting PCBs in AOC 4: Debris Ravine and other AOCs. Documentation of the use of PCBs should be included as an Addendum to RFI/RI Volume 1 to appropriately update the PCB discussion currently contained in the RFI/RI Volume 1 document.	Documentation of the use of PCBs will be included as an Addendum to the RF/RI Volume 1. The reference to UA-1 should be to UA-2 (the Former 300B Pipeline Liquids Tank). The pipeline drip legs are simply valves with an unusual name, and there is no evidence of any leakage (e.g., staining) at the two drip

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	Additionally, and more importantly, PCB occurrence in natural gas pipelines and pipeline condensate is well documented (USEPA, 2004; Kennedy, 1993). In the past, PCBs were used in oils for some compressor lubricants, as valve sealants, and used in a pipeline process known as "oil fogging" during the 1940s through the 1960s (USEPA, 2004). Therefore, PG&E should include PCBs as a constituent of potential concern (COPC) and include soil samples for PCB analyses in the following areas: former transformer area; chemical storage areas; used oil storage areas; pipeline drip legs/tanks, and areas where used oil may have been applied to the ground surface.	*Information Concerning PCBs and Naturally-Occurring Radioactive Materials at PG&E's Topock Compressor Station*), PCBs related to natural gas pipelines and pipeline condensate are not expected to be of concern at the Topock Compressor Station. DTSC has previously concurred with these findings. Therefore, PCB sampling is not proposed for areas associated with pipeline drip legs or tanks	New information cited in DTSC Comment 6 and the widespread detection of PCBs in AOC 4 warrant that sampling for PCBs occur at pipeline drip legs and tanks. UA-1 has already been sampled for PCBs in 2008 and in the 1990s.	legs that are within the area of potential effects (APE). PCB analysis has been proposed in applicable Part A and Part B SWMUs and AOCs.
7	The Photo File contains photographs of blasting that occurred during construction of the site (PG 2, 4, 80). PG&E should determine if explosives were stored in a designated area at the station for lengthy periods of time. If an explosives storage area is identified, PG&E should include explosives as a COPC for the storage unit and have soil samples collected from the area.	There is no record of any storage of explosives at the Topock Compressor Station, nor did any former employees mention any such practice during any of the interviews. Furthermore, blasting was not required during the operation of the station. Blasting would simply pose too much of a risk at an active gas compression facility.	Comment noted.	No response necessary.
8	The Photo File contains a photograph, dated April 16, 1951 (see Photo 4 - PG 86), of excavation activities for the waste oil sump that is located south of the tank farm. The RFI – Volume 1 describes this sump as measuring approximately 15 to 20 feet deep and 6 feet square. It was originally constructed as a concrete sump, but is now equipped with an inner steel liner and the original concrete structure acts as secondary containment (CH2M HILL, 2007). As this large waste sump has been in operation for over 50 years, it is recommended that environmental samples (soil matrix and/or soil gas) be collected to assess potential releases to the environment.	The tank farm and waste oil sump are active units, and therefore not part of the Corrective Action program. This request is similar to the inclusion of the Waste Oil Storage Tank in the RFA (it was identified as Unit 4.6). As documented in the Final RFI/RI Volume 1, the Waste Oil Storage Tank was removed from the Corrective Action program because it is an active unit. Neither the waste oil sump nor the tank farm were ever identified as SWMUs or AOCs. Furthermore, there is no exposed soil in these areas, groundwater is at a depth of 200 feet or more, the constituents in this area have low mobility, and bedrock may be present above first encountered groundwater. The tank farm currently has full containment and the tanks are fully above ground. There are no records of leaks from the tank farm; however, no records are kept to track inventory.	Based on PG&E's response environmental samples are warranted for both the tank farm and waste sump. Both units have the potential for releases. DTSC will determine if the operation of a particular unit makes it problematic to characterize soils. Just because a unit is active, does not necessarily eliminate it from being investigated and characterized in a timely manner. As requested, PG&E should provide the scrubber sump closure report to DTSC as soon as possible.	A detailed accessibility evaluation was conducted as part of the work plan preparation process and is documented in Appendix B. The tank farm and waste sump area is identified as unsafe for collection of surface and subsurface soil samples, see Topock Compressor Station Accessibility Map Figure B-2. However, proposed soil sample locations are located to the east and north of this area as part of the AOC 13 and AOC 19 investigation. Additionally, a monitoring well is being installed downgradient of this area (Site 3 in the East Ravine/TCS monitoring well installation investigation) to assess groundwater conditions in this area. The scrubber sump closure report was provided to DTSC on January 18, 2011.At the direction of DTSC, the Scrubber Sump was added to the work plan as AOC 26.

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	Additionally, environmental sampling of the adjacent tank farm may be warranted as it has also been in operation for over 50 years. PG&E should provide information to DTSC regarding the tank farm (e.g., documents of tank conditions, inspections, replacement, releases) to properly assess the need to characterize potential releases from the unit. The complete closure report is also requested for the former scrubber sump to ensure an appropriate analytical suite was used during its closure. PG&E should consider investigation of this area absent information regarding its closure.	As DTSC is aware, the scrubber sump was located in the lower yard. The only potential COPCs associated with the scrubber sump were pipeline liquids drained from the scrubbers. Information on the scrubber sump was included in the 2005 Draft RFI and the Final RFI/RI Volume 1, and DTSC has previously received a copy of the closure report. Another copy of the closure report will be provided to DTSC.		
9	The Photo File contains photographs of a “Lube Oil Drain Tank” as it is being readied for underground installation (Photo 2, PG 39 - see next page). PG&E should determine if this tank has been accounted for in the RFI Volume 1 (CH2M HILL, 2007). If it hasn’t, then environmental sampling should be conducted for the unit. Photo File 95 (Photo 5) shows an emergency gasoline driven fire pump. PG&E should determine if the source of gasoline came from an underground storage tank that has not been previously identified.	The “Lube Oil Drain Tank” is one of the USTs referred to as the Reusable Engine Oil USTs in the RFI/RI Volume 1 (Section 3.1.5.1). These tanks were removed, closed, and replaced by ASTs. No further action is necessary. The emergency fire pump is incorrectly identified as a gasoline driven pump. The pump was a natural gas fueled pump that was decommissioned in the 1990’s	Based on review of section 3.1.5.1 of RFI/RI Volume 1, it is not clear if the “Lube Oil Drain Tank” is one of the three former oil USTs located adjacent to the compressor and auxiliary buildings. Clarification is requested. Closure reports for these former tanks should be provided. PG&E should double check if the fire pump was always powered by natural gas. In an emergency, it would seem that an alternate fuel source would be desired. The radiator cowling pictured on Photo File 95 (Photo 5) suggests that the engine is a “Buda” which certainly could have run on gasoline or diesel.	The Topock compressor station contained four fuel USTs as well as three below ground lube oil drain tanks. All seven USTs have been removed and replaced with ASTs. PG&E is unable to find the closure reports for the former USTs, and a record search at the San Bernardino County Fire Department also failed to turn up the files. The Buda fire pump used natural gas as its primary fuel source. The backup fuel source was a propane gas cylinder located along the north outside wall of the fire pump building.
10	The Photo File contains a photograph (see Photo 4 from PG 115 on the following page) describing a view of the “acid house” as it is being erected. This building appears to be located at the southern end of the southern cooling tower in 1955 Figures 3-14 and 3-15 of the RFI Volume 1 (CH2M HILL, 2007). A similar structure is noted in Figure 3-15 for the northern cooling tower. Page 3-23 of the RFI Volume 1 refers to chemical storage sheds located near the cooling towers which may be equivalent to the “acid house” noted on PG115. PG&E should ensure environmental samples are collected from the footprint of both “acid houses”.	These “acid houses” are the chemical sheds located in AOCs 5 and 6 and are included in the sampling plans for these units.	Comment noted.	No response necessary.

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11	The Photo File contains several 1953 photographs of the “chemical storage building” (PG 122, 123, 124, 125, and 126). The “chemical storage building” is visible in the 1955 Figures 3-14 and 3-15 of the RFI Volume 1 (CH2M HILL, 2007). It is the most southeasterly building in the 1955 photographs. Very close examination of Figure 3-15 illustrates storage, possibly drum storage, along a fence to the north of the “chemical storage building”. Currently, the “chemical storage building” is identified as the “Maintenance Shop” in Figure 3-1 of the RFI Volume 1. Environmental samples in and around the “chemical storage building”/”Maintenance Shop” is warranted based on the findings discussed above. Area of Concern 7 - Hazardous Materials Storage Area identified in RFI Volume 1 is located adjacent and south of the “chemical storage building”/”Maintenance Shop”.	The characterization approach to this building will be reviewed and adjusted as needed for consistency with the Part B DQOs.	Characterization of the chemical storage building and surrounding area is obviously required. The Work Plan must ensure appropriate samples are collected from this unit.	This area was added as AOC 23. Proposed sampling described for this unit is described in the work plan.
12	The 1955 Figures 3-14 and 3-15 of the RFI Volume 1 (CH2M HILL, 2007) illustrate an unknown structure northeast of the chemical storage building. The structure had three wooden walls and the soils associated with the unit were lighter in color than surrounding soils. PG&E staff have indicated that they are uncertain what operations occurred at the structure. Without further information, it is recommended that environmental samples be collected from this former unit.	The characterization approach to this building will be reviewed and adjusted as needed for consistency with the Part B DQOs	The location of this building should be accurately located in figures to ensure soil samples are appropriately collected from this AOC.	This structure was added as AOC 22. Proposed sampling to evaluate potential impacts associated with this structure is described in the work plan.
13	The Photo File includes photographs of the “Hot Well” including the one pictured on the next page that shows the concrete Hot Well structure (circled in red) to the right of the main jacket water cooling tower. As it has been documented that the Hot Well was constructed 5 feet below grade and periodically overflowed (CH2M HILL, 2007), PG&E should ensure that the unit is appropriately characterized.	The hot well is included in the description of AOC 19. The characterization of AOC 19 will be reviewed and adjusted as needed for consistency with the Part B DQOs.	The location of the former Hot Well should be accurately plotted on AOC 19 figures so that soil samples are appropriately collected for this unit.	The location of the hot well was added to the figure for AOC 19. Access for sampling in this area is extremely limited.

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14	The Photo File includes two photographs (PG 110 and PG165) of a lube oil flushing system. PG&E should describe the operation of this unit and indicate if it had potential to release COPCs to the environment.	The lube oil flushing system was an ad hoc system used during construction to flush out the lube oil transfer lines prior to operation. The photo on Pg 110 shows the system used for flushing the lube oil system for Units K-1 through K-6 in 1951. The flushing system was located next to the lube oil sump in the tank farm area. The photo on Pg 165 shows a similar ad hoc system used to flush the lube oil system for Units K-7 through K-9 a few years later. It was located in the access road area between K-8 and the fin fan coolers. PG&E does not have detailed information about the use of both of these temporary systems but believes that the basic mode of operation would be to discharge the waste oil collected into the readily available waste oil sump. PG&E has no reason to believe that any releases to the environment occurred during this short-term operation more than fifty years ago. In fact, this system is designed to prevent releases and capture the oil in the waste oil system.	Comment noted.	No response necessary.
15	The Photo File includes several photographs related to installation of transite siding, roofing, and pipe conduit during construction of compressor station buildings and pipe galleys. Transite is identified in the following photographs in the Photo File: pages PG 41, PG 56, PG 91/92, PG 99, and PG 102. This comment supplements the RFI – Volume 1 (CH2M HILL, 2007) which discusses asbestos and transite noted in debris around the facility, but makes no mention as to where this material originated. PG&E should evaluate all Areas of Concern (AOC) and Solid Waste Management Units and determine if asbestos should be included as a COPC. For example, it is recommended that AOC 13 include asbestos analyses as transite debris has been noted in the lower yard and site fill. Future RFI reports discussing transite should identify that the compressor station was constructed with transite and is a probable source.	ACM has been included as a COPC in areas with transite (e.g., AOC 4). The transite material can be easily identified when it is encountered in the field and it is generally in good condition (not friable). Sampling for asbestos in the lower yard in areas where transite has been observed will be added to the AOC 13 sampling plan.	Comment noted. PG&E should also include analyses for asbestos in other areas when transite is identified in the field (e.g., Bat Cave Wash, AOC 14).	Seventy-two samples from AOC 14, which is the most likely area to have received wastes containing ACM, were analyzed for ACM. Only 2 samples were confirmed to have ACM, both at trace levels (less than 0.1%). Further general sampling for ACM is not warranted; however, samples from the mouth of Bat Cave Wash will be analyzed for ACM.

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16	The following photographs have been repeated in the Photo File: pages PG 18/19, PG 23/24, PG 91/92, PG 98/100, and PG 99/101. It is assumed that one of the pages from each preceding pair has not been scanned and included in the Photo File. Therefore, PG&E should include the omitted pages in a revised Photo File to be submitted to DTSC.	PG&E has reviewed the Photo file and found that no photos were omitted from the historic photo binder at TCS. Apparently the individual who scanned the photos duplicated a few of the pages.	Comment noted.	No response necessary.
17	The Photo File does not contain pages PG 140, PG 143, and PG 151. PG&E should clarify if this was intentional and if any photographs were omitted. If photos were omitted, they should be included in the revised Photo File to be provided to DTSC.	PG&E has reviewed the Photo file and found that no photos were omitted from the historic photo binder at TCS. Apparently the individual who scanned the photos did not number all of the pages in sequence.	Comment noted.	No response necessary.
18	PG&E's cover letter to the Photo File, dated August 22, 2007, indicates that some of the photographs came from the draft Route 66 National Register of Historic Places nomination report. It is not apparent if any of the photos came from this source. PG&E should clarify, in the revised Photo File itself and/or the associated cover letter, the source of each photograph.	PG&E will provide the requested information.	DTSC awaits PG&E's response.	No response necessary.
19	Photographs A and B on the next page are included in this memorandum in hope of identifying the nature of the earthen structure DTSC staff observed on June 19, 2007. The structure is located along a wash that connects to the East Ravine. The East Ravine parallels the main access road leading up to the Topock Compressor Station. Some staining was noted inside the structure and a layer of asphalt occurs in front of the earthen hollow, but the asphalt is not visible in the photos. In June 2007, DTSC questioned both PG&E and federal agency representatives if they knew what the earthen structure might be. Formal responses are still pending. PG&E should determine if the structure was used as part of site operations to assist in determining if environmental analyses are now warranted.	No information is available about this structure, which is not on PG&E property and does not appear to have any connection to PG&E. A speculative theory for this structure is that it was for dynamite storage for Route 66 construction in 1931, Arch Bridge construction in 1931, or Red Rock Bridge construction in 1889. This structure had only been discovered by PG&E personnel a few weeks prior to DTSC's site visit.	Based on PG&E's response, the structure could also have been used to store explosives during the construction of the compressor station. Therefore, it is requested that this unit be characterized and include sampling for explosives and TPH. The unit shall be designated AOC 25, Potential Explosives Storage Area. This AOC shall be described in the RFI Volume 1 Addendum.	Per recent discussion DTSC and DOI, this unit will not be designated as an AOC. No further investigation is required.

Comment No.	2008 HERD Comment	2010 PG&E Response	2010 DTSC Response	2011 PG&E Response
General	Overall, the development of the DQOs shows a significant improvement compared to the DQOs that were developed in the Soil Investigation Workplan, Part A.	See Response to DTSC Specific Comment 2	No response necessary.	No response necessary.
Specific 1	**Section 2.2.2, Potentially Exposed Receptors** As stated in Section 2.2.1, chemicals of potential concern (COPCs) could potentially move outside the fence line via sheet flow. Therefore HERD recommends that potential exposures of ecological receptors outside the fence line be evaluated if it is determined that COPCs that this transport mechanism did occur. Table 3-1, Problem 1 should be modified to incorporate this comment.	See Response to DTSC Specific Comment 2	No response necessary.	No response necessary.
Specific 2	**Section 2.2.3, Potential Exposure Depth Intervals** HERD recommends that the depth interval for surface soil exposures be from 0 to 0.5 foot below ground surface (bgs), rather than 0 to three feet bgs. If the site-specific potential exposures of the construction and maintenance workers would not be more than six feet bgs, then inclusion of chemical concentrations at depths deeper than six feet bgs could dilute the exposure point concentrations for subsurface depths. HERD recommends that potential exposures to soils at depths deeper than six feet bgs be included only if the chemical concentrations are higher than those detected from 0 to 3 feet bgs. By doing so, occasional exposures to soil at depths to 10 feet bgs are also addressed.	PG&E agrees with this recommendation, and it was incorporated into the Risk Assessment Workplan, which was approved by both DTSC and DOI	No response necessary.	No response necessary.
Specific 3	**Comments on Table 3-1** The following comments on Table 3-1 should be addressed and incorporated into the discussion in the text, wherever it is appropriate.	See Response to DTSC Specific Comment 2	No response necessary.	No response necessary.

Comment No.	2008 HERD Comment	2010 PG&E Response	2010 DTSC Response	2011 PG&E Response
	Problem 1, Inputs to Decisions Cultural resources impacts associated with each remedial technology are not inputs to deciding whether sufficient data had been collected to evaluate human health risk within the fence line. This information is more relevant during the feasibility study, as stated in Section 3.4, and should be deleted from this section of Table 3-1.			
	Problem 1, Study Boundaries HERD defers to the Geological Services Unit (GSU) on how the lateral delineation will be determined. However, should industrial CHHSLs/PRGs be considered potential criteria for lateral delineation, HERD had previously indicated that the CHHSL/PRG for each individual constituent should be adjusted to account for cumulative risk/hazard index. **Problem 1, Decision Rule** Another option for Decision 1b is to use the maximum concentration, rather than additional data collection, if the number of samples is inadequate for calculating a statistically-based exposure point concentration. This comment is consistent with the statement in the first paragraph of Step 6. **Problem 2 Inputs to Decision** Since beneficial use of groundwater is the stated problem whereas human health risk and/or hazard associated with groundwater use is not, the contribution to carcinogenic and noncarcinogenic risk is not an appropriate input to the decision. The lateral and vertical extent of COPCs that contribute to an excess risk would be relevant if one of the stated problems is the unknown risk associated with a specific use of groundwater. HERD recommends that this specific input to decision be deleted.	See Response to DTSC Specific Comment 2	No response necessary.	No response necessary.

Comment No.	2008 HERD Comment	2010 PG&E Response	2010 DTSC Response	2011 PG&E Response
	Problem 4, Stated Problem The stated problem indicates that the standard for clean closure had not been defined. If so, PG&E should clarify whether the assumption that clean closure of SWMUS 5, 6, 8, or 9 will be based on industrial use standards (Step 2, Identify the Decisions) is being proposed for consideration by DTSC.			
	Problem 4, Inputs to the Decision Although one of the assumptions in Problem 1 implies that risk may be one of the factors in the RCRA closure of SWMUS 5, 6, 8, and 9 (Problem 4), this was not stated in Problem 4. Consequently, all inputs pertaining to risk should be deleted if health risk is not one of the decision criteria for RCRA Closure of SWMUs 5-9.	See Response to DTSC Specific Comment 2	No response necessary.	No response necessary.
	Problem 6, Study Boundaries HERD does not agree with the statement that target analytes will be determined by the risk assessment. Target analytes are analytes that were detected in previous investigations. The risk assessment cannot identify COPCs that are significant contributors to risk unless the GSU has agreed that the characterization is adequate. In addition, the discussion on target analytes should be in "Inputs to the Decision" rather than in "Study Boundaries."	See Response to DTSC Specific Comment 2	No response necessary.	No response necessary.
Specific 4	**Section 4.2** As indicated in the preceding comments, the CHHSLs/PRGs should be adjusted in order to account for cumulative risk and/or hazard index.	See Response to DTSC Specific Comment 2	No response necessary.	No response necessary.
Specific 5	**Figure 4-3 and Section 4.2.2** Step 13B states that if there is a potential risk of leaching to groundwater, this pathway will be addressed through the risk assessment and/or remedial action. One of the Inputs to Decision	See Response to DTSC Specific Comment 2	No response necessary.	No response necessary.

Comment No.	2008 HERD Comment	2010 PG&E Response	2010 DTSC Response	2011 PG&E Response
	shown in Table 3-1, Problem 2, is "Beneficial Uses of Groundwater," which is usually the maximum contaminant level (MCL) in drinking water. Clarification should be provided whether addressing through risk assessment means that alternative use of groundwater will be proposed for concurrence and that risk-based concentrations based on this alternative use will be developed.			
Specific 6	**Figure 4-4A** It is HERD's understanding that each of the decision boxes (shaded in gray) indicates that the data set from each SWMU will be evaluated separately from the entire data set inside the fenceline. Clarification should be provided because the magnitude of the remediation, if any, to support closure of each RCRA SWMU could be different from the remediation required for the entire area inside the fenceline.	See Response to DTSC Specific Comment 2	No response necessary.	No response necessary.
Specific 7	**Figure 4-5, Table 3-1, Problem 4, and Section 4.2.4** If the lateral study boundaries for SWMUs 5, 6, 8, 9 consist of the footprint of each SWMU, it would be more straightforward to evaluate the risk for each SWMUs rather than for the entire area within the fenceline, as shown in Step 3. Therefore, Steps 3 and 4, and the relevant discussion in Section 4.2.4 should be modified accordingly.	See Response to DTSC Specific Comment 2	No response necessary.	No response necessary.

Comment No.	2008 HERD Comment	2010 PG&E Response	2010 DTSC Response	2011 PG&E Response
	The described approach is confusing. If the number and the locations of the samples to be collected in order to address Problem 4 were truly premised on the DQO process, the decision rule should specify whether the maximum concentration or a statistically-based concentration within the boundaries of each SWMU will be applied. Consequently, Steps 5 and 6 in Figure 4-5 can be eliminated. The discussion in Section 4.2.4 should be modified for consistency with the revisions to Figure 4-5 based on HERD's comments.			
Specific 8	**Figure 4-6, Problem Statement 5** Step 4 indicates that potential leaching to groundwater will be evaluated if there is a potentially complete migration pathway to areas outside the fenceline. However, this is not stated in the decision rule for Problem 5 and not clearly explained in Section 4.2.5. Additional discussion should be provided for clarification. It should also be explained whether the action to go to Figure 4-3A refers to Figure 4-3 or to Step 3A in Figure 4-3.	See Response to DTSC Specific Comment 2	No response necessary.	No response necessary.

Comment No.	Comment Location	Type[a]	Comment	Comment Response
Per DOI Request, responses to DOI comments are not provided.				

Comment No.	2007 FMIT Comment	2010 PG&E Response	2010 DTSC Response	2011 PG&E Response
1 (General)	Primarily, the Tribe wishes to express its concern over this incremental disturbance to sacred grounds. The Tribe has repeatedly provided comments relating to the offensiveness of the many, many intrusions, disturbances, and violations of the sacred grounds that have accrued to date. Indeed, this workplan represents yet another significant level of disturbance. In commenting on the Part A Soils Workplan, the Tribe strongly petitioned for the DTSC to apply an alternative approach to minimize sampling and to try in every way possible to minimize the number of samples to be collected.1 In response, DTSC indicated that it did not understand why the Tribe would consider the number of samples proposed as excessive. DTSC pointed to the large number of non-contiguous sites covering "vast acreages" that were impacted historically by discharges.2 Indeed, this characterization highlights the basis of the Tribe's concern: that there seems to be no degree of characterization that the DTSC considers to be enough or excessive. Indeed, the Tribe is aware that "DTSC is mandated to evaluate any such potentially impacted areas to ensure protection of human health and the environment through reasonable science." At the same time, the Tribe questions whether "reasonable science" is so prescriptive as to necessitate such a degree of inflexibility in DTSC's approach to assessment. The DTSC further points out that it cannot "predetermine" a remedy without such information, yet the Tribe notes that the U.S. Environmental Protection Agency (EPA) has embraced the concept of presumptive remedies "… to streamline site investigations and accelerate the selection of cleanup actions…."3 A presumptive remedy is defined as "… a technology that EPA believes, based upon its past experience, generally will be the most appropriate remedy for a specified type	The FMIT perspective expressed in this comment is that the work plan is too extensive and includes too many samples. This perspective is in conflict with the comments received from the other parties. Clarification was requested in an April 21, 2008 email from PG&E to DTSC and DOI. The following response was provided in the DTSC's response dated March 10, 2010 (*Part B Soil Investigation Clarification Comments and Additional Direction, Pacific Gas and Electric Compressor Station Needles, California (EPA ID No. CAT080011729*): <u>DTSC Response:</u> PG&E should first address all comments based on the technical needs of the project. DTSC is open to approaches that can minimize impacts to the area caused by the characterization activities. However, the initial characterization proposal must be based on sound science. Tribes and stakeholders will have the opportunity to provide input regarding the proposed plan and discuss all of their concerns with the agencies and PG&E. Additional revisions to the proposal are anticipated and will be needed to address comments obtained from the stakeholders. If applicable, DTSC recommends that PG&E reconsider using XRF and other screening techniques to potentially reduce investigation impacts and hopefully also expedite certain phases of the investigation. DTSC understands that PG&E is currently utilizing the XRF for the AOC-4 removal activities.	DTSC recognizes and respects the Tribe's views regarding the sacredness of the area. DTSC understands the Tribe's concern regarding the potential physical and cultural disturbance from the proposed sampling and will continue to work actively with all the tribes and stakeholders to minimize potential disturbances. DTSC notes that changes have occurred in the general approach for the soils investigation since the submittal of the draft 2007 Part B RFI Workplan. More emphasis will be given to the use of data quality objectives (DQOs) to guide the investigation. A DQO's technical memorandum will be developed to help guide the formulation of a revised draft Part B RFI Workplan. DTSC believes that the DQO's that are currently being developed, along with the comments on the draft 2007 Part B Workplan, will result in a revised workplan that may be substantially different from the draft 2007 Part B RFI Workplan. Regardless of the changes to the next version of the draft workplan, it will be distributed to all stakeholders to solicit additional comments. It is DTSC's hope that the discussions with the tribes and stakeholders will result in a final workplan that will present a streamlined approach and minimize potential physical and cultural impacts.	No additional response necessary.

Comment No.	2007 FMIT Comment	2010 PG&E Response	2010 DTSC Response	2011 PG&E Response
	of site."4 If the concept of presumptive remedies can be used to facilitate remedy selection based on site to-site similarities at geographically different facilities, why can't the same concept be applied to the "non-contiguous" areas with similar operational histories across the Topock Site? It seems that this may lessen sampling requirements. With full recognition of the value of data abundance in decision making, the Tribe understands that there will be residual uncertainty with any level of characterization sampling. In its comments, the DTSC also stated that it "… must balance the need to properly define the nature and extent of contamination with minimal site disturbance." The Tribe is wondering how the DTSC in fact achieves this "balance," moreover how it views its performance along this line. As pointed out in EPA's principles for Superfund reauthorization: "The Administration's goals for Superfund reauthorization continue to be to: protect human health, welfare and the environment; maximize participation by responsible parties in the performance of cleanups; ensure effective State, Tribal and community involvement in decision making; and promote economic redevelopment or other beneficial reuse of sites, all in a manner that increases the pace of cleanups, improves program efficiency and decreases litigation and transaction costs, and which does not disrupt or delay ongoing progress." [emphasis added]5 From this policy, it would seem that human health, welfare, and the environment are all factors that must be appropriately weighed in the decision process. At this point, other than DTSC's claim, the Tribe does not understand how or at what point the DTSC exercises the balance between that it claims to be achieving. It seems that DTSC is not recognizing that the			

Comment No.	2007 FMIT Comment	2010 PG&E Response	2010 DTSC Response	2011 PG&E Response
	issue that the Tribe is raising relates to the disruption of cultural values of the Tribe, not merely to "site disturbance." 1. Hargis + Associates, Inc., 2007. Comments to DTSC dated February 9, 2007 on Part A Soils Workplan. 2. DTSC, 2007. Response to Fort Mojave Indian Tribe (FMIT) Comments on the RFI / RI Soil Sampling Work Plan – Part A. June 2007. 3. EPA, 1999. "Presumptive Remedy for Metals-in-Soils Sites." EPA 540-F-98-054. URL accessed at: http://homer.ornl.gov/oepa/guidance/cercla/metalsinsoil.pdf 4. FRTR, no date. 2.1 Presumptive Remedies, Remediation Technologies Screening Matrix and Reference Guide, Version 4.0. URL accessed at: http://www.frtr.gov/matrix2/section2/2_1.html 5. EPA, 2007. Superfund Reauthorization Principles. URL accessed at: http://www.epa.gov/superfund/policy/congress/princple.htm			
2	In addition to the issues raised above regarding the number of samples, the Tribe is wondering if there is any estimate of the total number of soil characterization samples collected to date. Also, has there been any quantification with regard to the volume of soils removed and disturbed historically and with respect to this proposal? Finally, is there any plan to repatriate these soils?	An estimate of the total number of historic soil samples can be developed and will be included in the workplan; however repatriation of soils removed during historic sampling is not feasible. For soil removed from borings in the future, consistent with current practice, PG&E will collect the soil and stockpile it until the sample collection is completed and borings will be grouted. After the collected soil has been evaluated, PG&E will work with the Tribe to determine if another appropriate re-use of the soil is feasible.	DTSC defers to PG&E regarding the specific number and volume of samples collected. For future sampling, DTSC agrees with the proposal to potentially re-use soils to the extent possible.	An estimated 1,002 soil samples from 480 locations have been collected in and around the compressor station to date. This estimate does not include recent samples collected pursuant to maintenance activities within the fence line of the compressor station. The volume of samples collected and soil removed cannot be quantified. Quantities of investigation-derived waste have not been recorded during prior investigations.

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3	It is unclear from Figure 6-1 whether the alternative staging areas are on already disturbed areas and if so, what the prior disturbances are. In any case, those staging areas seem to be larger than need be and may unnecessarily disturb additional land.	All staging areas were selected because they are already disturbed ground. The size of the areas was defined to ensure that all equipment that may be required (e.g., a long-reach excavator) could be located entirely within the staging area/on previously disturbed ground.	The Tribe's comment is noted. As indicated above, due to the anticipated substantial revision in the revised workplan, all issues, including staging areas, will be re-evaluated.	No additional response necessary.
4	As you are aware, the Tribe has already commented on the December 11, 2007, PG&E Work Plan for the East Ravine Groundwater Investigation. Comments were transmitted to you on December 28, 2008. Within those comments, the Tribe asserted its opposition to the proposal to drill new monitoring wells in the East Ravine area based on the violation that they represent to its sacred grounds. Specifically, the Tribe's comments indicated that "…the need to do further characterization at this time (as opposed to some time in the future that may indicate the need for a separate remedy component) is not fully justifiable." Noting that this work plan also includes a proposal to construct up to three additional monitor wells for investigating groundwater within the fenced area, the Tribe reasserts its opposition to the proposed additional wells on the same grounds as previously stated for the East Ravine area.	This comment is in conflict with the direction received from the agencies. Specifically, DTSC provided the following response in DTSC's response letter dated March 10, 2010 (*Part B Soil Investigation Clarification Comments and Additional Direction, Pacific Gas and Electric Compressor Station Needles, California (EPA ID No. CAT080011729*): DTSC Response: PG&E should first address all comments based on the technical needs of the project. DTSC is open to approaches that can minimize impacts to the area caused by the characterization activities. However, the initial characterization proposal must be based on sound science. Tribes and stakeholders will have the opportunity to provide input regarding the proposed plan and discuss all of their concerns with the agencies and PG&E. Additional revisions to the proposal are anticipated and will be needed to address comments obtained from the stakeholders. If applicable, DTSC recommends that PG&E reconsider using XRF and other screening techniques to potentially reduce investigation impacts and hopefully also expedite certain phases of the investigation. DTSC understands that PG&E is currently utilizing the XRF for the AOC-4 removal activities.	DTSC notes that the groundwater investigation component of the Part B soils investigations have been removed and will be addressed separately in the East Ravine/Topock Compressor Station Groundwater Investigation. The Tribe's comment will be addressed as part of the East Ravine groundwater investigation.	No additional response necessary.
5	In recognition that these comments raise significant concerns and issues on behalf of the Tribe, we offer our availability for further discussion to facilitate resolution of these comments as well as the many related site activities that comprise the cumulative adverse impacts to the sacred grounds. Please contact me if I can provide further information and/or arrangements along these lines.	Comment acknowledged. PG&E appreciates the Tribe's willingness to participate in this manner. PG&E defers to the agencies on the detailed process for stakeholders and tribal involvement,	DTSC appreciates the Tribe's participation and looks forward to working with the tribes and stakeholders in resolving all concerns and issues.	PG&E will continue to notify the Tribe regarding proposed investigation activities to ensure that the Tribe has the opportunity to provide input.

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1	Overall EMC found the Work Plan to be well written, organized and followed a logical progression and presentation of information with well documented tables and figures.	Comment acknowledged.	No response necessary.	No additional response necessary.
2	Section 1.1 Background describes that the investigation and remedial activities at the Topock Compressor Station are being performed under both the Resource Conservation and Recovery Act (RCRA) corrective action process and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). In February 1996, PG&E and the California Department of Toxic substances Control (DTSC) entered into a Corrective Action Consent Agreement. It is further stated that the United States Department of Interior (DOI) is the lead agency on land under its jurisdiction, custody and control, and that the DOI is responsible for oversight of the response actions being conducted by PG&E pursuant to CERCLA. Not referenced in this document is the additional voluntary corrective action cleanup agreement that may exist with the Arizona Department of Environmental Quality (ADEQ) who is responsible for the investigation and clean up activities in Arizona. EMC understood that DTSC was the sole responsible regulatory agency and final decision maker related to all corrective action and technical activities being conducted at the Topock site, regardless if activities were on federal lands or activities being conducted in California or Arizona. It would be helpful to provide additional clarification regarding the authorities and responsibilities of each of the three regulatory agencies, since it appears that there may be three separate regulatory agencies with separate decision making authority and responsibilities. It would also be helpful to understand if a Memorandum of Understanding (MOU) has been executed between these agencies to streamline and expedite the corrective action process.	The Arizona Department of Environmental Quality (ADEQ) has accepted PG&E's application for the ADEQ Voluntary Remediation Program (VRP). The VRP is not mentioned in RFI/RI documents because the RFI/RI documents are specifically prepared to meet the requirements of the RCRA Corrective Action and CERCLA. Separate documents are required by the VRP. DOI and DTSC continue to oversee the larger study area as part of the RCRA and CERCLA investigations. The VRP remains active as a stakeholder in these investigative activities as they relate to potential future impacts that could affect water quality under the jurisdiction of the State of Arizona There is not a Memorandum of Understanding between the agencies enforcing RCRA Corrective Action, CERCLA, and the VRP.	DTSC is the lead regulatory agency under the Resource Conservation and Recovery Act (RCRA) for the corrective action activities related to the PG&E Topock facility. DTSC shares regulatory lead responsibility with DOI which operates under the authority of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). DTSC defers to PG&E regarding its voluntary agreement with the ADEQ. DTSC does not have any memorandum of agreement with the other agencies related to the PG&E Topock project; however, because RCRA and CERCLA requirements are often very similar, it is in the best interest of all parties that DTSC and DOI work closely to ensure that PG&E satisfy all regulatory requirements simultaneously to the extent possible.	No additional response necessary.
3	Section 3.1 describes the overall objectives of the soil	The DQOs process is being conducted in accordance with the requirements of DTSC and DOI. The Part B	DTSC agrees with the Tribe in expediting the investigation and remedial activities related to soils at	PG&E appreciates the Tribes' input on the Part A Data Gaps Evaluation and looks

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	investigation program as: 1. sufficiently characterize the investigation areas and; 2. minimize the number of samples and associated disturbance within the facility and facility operations. EMC noticed the absence of the significant basic objectives such as “expedite the final remedy selection” “reduce the length of time’ or “eliminate delays in completing the investigation”. It appears to the reader that the basic conceptual approach continues to be, minimize the samples and potentially conduct multiple phases of investigations over a long period of time. While EMC agrees that the Data Quality Objectives (DQO) process is a recognized procedure and the Environmental Protection Agency (EPA) has provided guidance on the DQO process, it appears that PG&E and the agencies are trying to fit the Topock project into the standard DQO process rather than using the DQO process to beneficially move the project forward and reach a final remedy as quickly as possible.	DQOs are being redrafted. The goal of the DQO process is to ensure that data collected at each stage of the investigation process are of sufficient quantity and quality to enable the specified decisions to be made.	the PG&E Topock facility. DTSC hopes that the soils-related activities will gain momentum now that the groundwater related activities are moving towards remedy design. DTSC believes that the DQO’s that are currently being developed, along with the comments on the draft 2007 Part B Workplan, will result in a revised workplan that may be substantially different from the draft 2007 Part B RFI Workplan. It is DTSC’s hope that the continuing discussions with the tribes and stakeholders will result in a final workplan that will present a streamlined approach and minimize potential physical and cultural impacts.	forward to continued participation by the Tribes.
4	Section 3.6 states that the existing values for background concentrations of metals are preliminary and that refined background concentrations will be evaluated pursuant to the Part A Work Plan. EMC agrees with this statement and believes that the previous background metal data set is not representative of actual background conditions and that separate background values should be developed for each lithologic unit within the study area.	The additional background investigation has been completed. The revised final technical memorandum was submitted and accepted by DTSC (*Revised Final Soil Background Investigation at Pacific Gas and Electric Company Topock Compressor Station, Needles, California*; CH2M HILL, May 2009). Statistical evaluation of the background data indicated that the differences between the lithologic units were not significant enough to merit defining separate background data values for each unit. All background data were combined into one data set and used to develop the background threshold value (BTV) concentrations.	DTSC defers to PG&E’s response to the Tribe’s comment.	No additional response necessary.
5	EMC believes that direct active onsite participation by one of the regulatory agencies would greatly assist in	DTSC and DOI have the authority to be on-site for some or all of the sampling, and will make	DTSC agrees with the Tribe that expedited field decisions are valuable and will help streamline the	No additional response necessary.

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	expediting completion of the investigation activities. It would seem appropriate that an appropriate regulatory agency commit the necessary qualified professional staff and resources to actively observe drilling and sampling activities so that expedited field decisions could be made related to the inclusions of additional samples for analysis or the modification or addition of sample locations.	determinations regarding the value of having a representative in the field throughout the investigation program.	investigation process; however, DTSC unfortunately does not have the resources to commit staff to be present for all field activities. DTSC makes every effort to coordinate with DOI in sharing field oversight duties. In addition, DTSC is available via electronic mail and telephone should field personnel require immediate attention and response from DTSC.	
6	Section 5.7 (AOC 5 Cooling Tower) Considering the elevated chromium concentrations at PS-IS and PS-16, minimal sampling effort is being proposed in these areas. Additional sampling locations appear to be warranted.	The existing sampling data are classified as Category 1. The proposed sampling analysis will augment that sampling data and will provide sufficient data for characterization of the AOC.	DTSC concurs with the Tribe's comment and has provided comments to PG&E requesting additional sampling at the cooling towers.	Additional sampling at the cooling towers has been proposed in the work plan (see proposed sampling at AOCs 5 and 6).
7	Section 5.8 (AOC 6 Cooling Tower) Considering the elevated chromium concentration at PS-3, PS-4, and PS-S it would appear that additional sampling effort would be justified along the western boundary of the AOC.	The existing sampling data are classified as Category 1. The proposed sampling analysis will augment that sampling data and will provide sufficient data for characterization of the AOC.	DTSC concurs with the Tribe's comment and has provided comments to PG&E requesting additional sampling at the cooling towers.	Additional sampling at the cooling towers has been proposed in the work plan (see proposed sampling at AOCs 5 and 6).
8	Section 5.11 (AOC 15 Auxiliary Jacket Cooling Water Pumps) Elevated chromium concentration occur at JP-6 and JP-10 and show an increasing trend west of JP-5. Additional sampling locations along the western boundary appear to be appropriate. Elevated chromium concentrations occur at JP-9, JP-8 and JP-2. Additional sampling locations appear to be warranted. The sample locations on Figure 5-15 do not match Figure 5-16. Sample location JP-9 is shown to be located at a different location on each map.	The proposed boring locations and sample depths will be reviewed and adjusted as needed for consistency with the Part B DQOs. Figures 5-15 and 5-16 will be revised.	DTSC concurs with the Tribe's comment and also acknowledges PG&E's response to take the appropriate actions.	Proposed sampling at AOC 15 is described in the work plan.
9	While great effort was used to evaluate the Precision, Accuracy Representativeness, Comparability and Completeness of Laboratory data that ultimately placed the data into three usability categories, was there a similar QA/QC process to evaluate and determine the fundamental basic accuracy of previous sample locations.	The sample locations shown in the RCRA Facility Investigation (RFI) and RFI work plans are based on the best available information, including surveyed sample locations, descriptions of the sample locations, and/or sample locations shown in figures provided with published reports. In most cases, the approximate location is known, and sufficient additional samples are proposed in the Part A and Part B work plans to ensure that areas of potential concern are adequately	DTSC defers to PG&E's response to the Tribe's comment.	No additional response necessary.

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		evaluated and delineated. The degree of uncertainty as to the precise location of a historic sample must always be evaluated in conjunction with the degree of precision deemed appropriate for the original sampling. The inability to locate a precise sampling position does not, in itself, mean that the data from that sampling are unusable or of limited usability, provided that the location can be determined with confidence to exist within an area for which no one point was more or less appropriate to accomplish the goals of the original sampling.		
10	The Tribes would like to be notified, in advance, of any scheduled sensitivity training. The Tribes have previously requested to be contacted in advance of any field activities and may choose to provide Tribal Monitors.	PG&E is committed to involving the tribes in the RFI/RI program at the compressor station, and will notify the tribes in advance of any field activities. Furthermore, prior to each major phase of field activities, PG&E holds a project initiation meeting at the compressor station and invites tribes/stakeholders/agencies and pertinent contractors to attend. During these project initiation meetings, tribes and agencies are invited to discuss/ share their viewpoints relating to the project. Such open discussion of viewpoints and sharing of information have enhanced the understanding of the project sensitivity for all participants.	DTSC will continue to coordinate with PG&E in notifying the tribes, and all stakeholders, in advance of all field activities.	No additional response necessary.