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APPENDIX A O C 9
POST- SOIL NON-TIME CRITICAL REMOVAL ACTION HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT FOR AOC 9 EXPOSURE AREA

Topock Compressor Station
Needles, California

May 2026

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ACRONYMS AND ABBREVIATIONS

µg/dL	microgram per deciliter
2019 HHERA	2019 Soil Human Health and Ecological Risk Assessment Report
2,3,7,8-TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
4,4-DDE	4,4-dichlorodiphenyldichloroethylene
AOC	Area of Concern
AOC 10a	AOC 10 Subarea a
Arcadis	Arcadis U.S., Inc.
BAF	bioaccumulation factor
B(a)PEQ	benzo(a)pyrene equivalent
bgs	below ground surface
BTAG	Navy/Biological Technical Assistance Group
CDI	chronic daily intake
COPC	constituent of potential concern
COPEC	constituent of potential ecological concern
D/F	dioxin/furan
DOI	U.S. Department of the Interior
DTSC	Department of Toxic Substances Control (California)
EC	exposure concentration
EPC	exposure point concentration
ERA	ecological risk assessment
HHERA	human health and ecological risk assessment
HHRA	human health risk assessment
HI	hazard index
HQ	hazard quotient
ILCR	incremental lifetime cancer risk
LOAEL	lowest-observed adverse effects level
LOE	line of evidence
main report	Post-Soil Non-Time Critical Removal Action Soil Human Health and Ecological Risk Assessment Report
mg/kg	milligram per kilogram

NA	not applicable
ng/kg	nanogram per kilogram
NOAEL	no-observed adverse effects level
NTCRA	non-time-critical removal action
OEHHA	Office of Environmental Health Hazard Assessment
OHV	off-highway vehicle
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PG&E	Pacific Gas and Electric Company
RAWP	Human Health and Ecological Risk Assessment Work Plan
RBRG	risk-based remedial goal
site	Pacific Gas and Electric Company Topock Compressor Station site
SUF	site use factor
SWMU	solid waste management unit
TAA	target action area
TCS	Topock Compressor Station
Technical Memo	Soil Risk Assessment Addendum: Proposed Approach to Update the Human Health and Ecological Risk Assessment after Completion of the 2023 Non-Time Critical Removal Action
TEQ	toxicity equivalent
TPH	total petroleum hydrocarbon
TRV	toxicity reference value
UA	undesignated area
UCL	upper confidence limit
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
WOE	weight of evidence

1 INTRODUCTION

This appendix presents the human health and ecological risk assessment (HHERA) for the Area of Concern 9 (AOC 9) potential exposure area located outside the Topock Compressor Station (TCS) in Needles, California. The risk characterization presented herein evaluates the current conditions in AOC 9 following completion of the non-time-critical removal action (NTCRA) in 2023. Consistent with the approach for the Post-NTCRA HHERA detailed in the January 30, 2024 Soil Risk Assessment Addendum: Proposed Approach to Update the Human Health and Ecological Risk Assessment after Completion of the 2023 Non-Time-Critical Removal Action (Technical Memo; Arcadis U.S. Inc. [Arcadis] 2024) to U.S. Department of the Interior (DOI) and Department of Toxic Substances Control (California) (DTSC), the updated risk characterization is presented only for risk-driving receptors.

The AOC 9 potential exposure area, shown on Figure AOC 9-1.1, is approximately 1.6 acres in total. Table AOC 9-1.1 presents historical sample locations evaluated in the 2019 Soil Human Health and Ecological Risk Assessment Report (2019 HHERA; Arcadis 2019) as well as recent samples collected in 2023 as part of a NTCRA as described in the text that follows. Samples were collected from locations in AOC 9, AOC 10 Subarea a (AOC 10a), and AOC 10 proximate to AOC 10a (as described in this section). In accordance with the final Human Health and Ecological Risk Assessment Work Plan (RAWP) documents (Arcadis 2008, 2009, 2015), this AOC 9 risk assessment does not include samples related to AOC 10 Subareas b, c, and d and surrounding areas, which are evaluated as part of the AOC 10 potential exposure area (see Appendix AOC 10).

The 2019 HHERA (Arcadis 2019) identified potential risk to three human recreator receptors (campers, hikers, and off-highway vehicle [OHV] riders) associated with potential exposure to dioxin toxicity equivalent (TEQ) and hexavalent chromium at some locations within the AOC 9 potential exposure area. Potential risk was also identified for one ecological receptor (desert shrew) associated with total chromium, copper, and dioxin TEQ at some locations. The NTCRA targeted soil removals in areas where excess risk was identified. The NTCRA soil removal areas in AOC 9 and current in-place sample locations (i.e., historical and NTCRA confirmation samples remaining in place) are shown on Figure AOC 9-1.2.

Details of the NTCRA are presented in Section 2.2.3 of the Post-NTCRA HHERA Report (the "main report"), to which this appendix is attached, and are summarized in Section 1.2 as relevant to AOC 9. A summary of the updated human health risk assessment (HHRA) and the ecological risk assessment (ERA) results are also presented in Sections 5 and 6, respectively, of the main report. This Post-NTCRA HHERA refers to "HHRA" when discussing specific information for assessing risks to human health, "ERA" when discussing specific information for assessing risks to potential ecological receptors, and "HHERA" when discussing topics that are common to both the HHRA and the ERA.

Descriptions of the physical location and characteristics of the AOC 9 potential exposure area and the HHERA methodologies are provided in the main report and the final RAWP documents (Arcadis 2008, 2009, 2015) and are not repeated in this appendix. Detailed discussions of the historical uses and sampling and analysis are presented in the 2019 HHERA (Arcadis 2019).

This Post-NTCRA HHERA summarizes use of the Pacific Gas and Electric Company (PG&E) TCS site (site), data evaluation, potential receptors, potential exposure pathways and updated results of the HHERA risk characterization for soil in the AOC 9 potential exposure area for risk-driving receptors following completion of

the NTCRA. Tables and figures specific to the AOC 9 potential exposure area HHERA are also presented in this appendix.

1.1 Summary of Site Use

AOC 9, also referred to as the Southeast Fence Line is located entirely on property owned by PG&E in the southeast portion of the TCS east (outside) of the facility fence line and just south of the visitor parking lot on a steep slope as shown on Figure AOC9-1.1. In accordance with the RAWP (Arcadis 2008), and due to its proximity and topography, AOC 10a has been included as part of the AOC 9 evaluation for the HHERA and this Post- NTCRA HHERA. Since AOC 10a and AOC 9 are close to each other, the same small wildlife populations can be expected to forage across both AOCs as a consolidated exposure area. In accordance with DTSC's directions in 2017 (DTSC 2017), this combination of AOCs identified for the ERA in the final RAWP documents (Arcadis 2008, 2009, 2015) was evaluated also for the HHRA.

The primary sources of contamination for AOC 9 are runoff from the TCS and discharge to shallow soil of chromium-containing cooling water from the facility via a broken stormwater discharge pipe. In 2000, the broken stormwater drainage pipe and stained soil were found in the area, and the stained soil was removed. The staining most likely originated from incidental leaks near the Auxiliary Building that entered a pipe trench leading to a storm drain. The stained soil was excavated, a new stormwater drainage pipe was installed, and the area was backfilled with 1 to 2 feet of clean soil.

Although the actual depth of the pipe break is not known with certainty, based on similar site facilities and the limitations from the steep slope at this location, it is expected to have been between 1 to 3 feet below ground surface (bgs). The quantity of liquid released from the broken storm drain is assumed to be relatively small since—with the exception of storm events—the drain would have only captured small incidental leaks or spills from various systems at the TCS. Soil samples have been collected throughout AOC 9, including at the top of the slope near the TCS, near the bottom of the slope, and near the broken storm drainpipe, with confirmation samples also being collected following the excavation.

In 2011, a PG&E employee indicated a second storm drain might have been located in this area. The exact location of the former storm drain line is uncertain, and in 2012 the footprint of AOC 9 was extended 100 feet to the north to ensure it addresses both potential locations. The primary source media are surface and shallow soils.

If volatile organic compounds (VOCs) were released in surface soils, they would be expected to have been degraded by heat and light and are likely not present in significant quantities. Potential sources of dioxins and furans in the vicinity of the TCS may include historical industrial activities as well as other sources unrelated to TCS activities (i.e., unauthorized dumping and burning; regional wildfires; combustion of diesel and leaded gas; and exhaust from cars, trucks, and trains) (CH2M 2017).

AOC 10a, now part of AOC 9, was noticed during a site visit in May 2006. A storm drain was noted leading from the southeastern portion of the TCS and discharging into the East Ravine. A small area of stained soil (possibly old hydrocarbon staining), approximately 3 feet by 3 feet, was noted at the discharge of the storm drain. This is shown in Figure AOC9-1.1 as AOC 10a. Although discharge from the steam-cleaning area has always been directed to the oily water treatment system, this storm drain may have captured some runoff from the steam-cleaning area before the steam-cleaning area was fully bermed (CH2M Hill Inc. 2006). Dark soil—

what appears to be stained soil—is present along the west side of AOC 9 in a May 19, 1955 aerial photograph.

The primary source media at AOC 9 are surface and shallow soils. Liquids released to these areas could have infiltrated to deeper soils and/or flowed downhill in surface or shallow subsurface runoff. These flows would have entered the East Ravine. Due to the steep angle of the slope at AOC 9, infiltration is likely to be a less significant pathway than surface runoff. Constituents in residual contamination in the area of the former broken stormwater discharge pipe could have migrated to deeper soils. However, due to the relatively small quantity of liquid released, the angle of the slope, and shallow depth of the release of cooling water, leaching to groundwater from this area is unlikely.

For AOC 9, a potential secondary release pathway is windblown dust contamination, which could have occurred as a result of dust being transported from the AOC. Windblown contamination, if any, would be limited to surface soils.

1.2 Summary of NTCRA in AOC 9

As summarized in the NTCRA Completion Report (Jacobs 2025), the DOI selected a removal action of excavation of contaminated soil and debris at target action areas (TAAs) within the site, located in Needles, California (DOI 2021). PG&E commenced the NTCRA soil removal action on July 25, 2022, according to the DOI-approved Soil NTCRA Work Plan (Jacobs 2022), which incorporated comments from stakeholders, including DOI, U.S. Bureau of Land Management, and tribal stakeholders.

The removal action consisted of the following activities:

- Soil excavation;
- Mechanical separation and size separation of rocks, debris, and soil; and
- Disposal of the contaminated soil and debris in approved and permitted landfills.

Work associated with the NTCRA was completed on May 20, 2024.

In AOC 9, removal activities associated with the NTCRA were completed at one TAA associated with AOC 9 and one TAA associated with AOC 10a. The TAAs, extents of the NTCRA removal areas (including step-out locations), and confirmation samples remaining in place are presented on Figure AOC9-1.2. Details of the removal actions, remaining contamination (if any), and confirmation sampling are presented in Section 3 of the NTCRA Completion Report (Jacobs 2025) and summarized briefly for each AOC 9 TAA in the following list.

- AOC 9 TAA1: AOC9 TAA1 is located south of the TCS visitor parking area and immediately east of the facility fence line on a steep slope between the TCS fence line and B-Line Road. AOC9 TAA1 received discharges from a stormwater drainpipe and surface disposal of debris. Historical soil sample results indicated soil impacted by metals and dioxin/furan (D/F) was present within the TAA, with the greatest contaminant concentrations within 3 feet of the surface. Removal activities at AOC9 TAA1 began in July 2023 and were completed in September 2023, resulting in the removal of approximately 90 cubic yards of contaminated soil (Section 3.7 of the NTCRA Completion Report [Jacobs 2025]). Contamination consisted of orange and white discolored soils at depths up to 3 feet bgs throughout the TAA. The discolored soil contained dioxin TEQ at concentrations exceeding the numerical removal action goals (RAGs). Debris, not associated with the stained soils, was also present. Seven

confirmation samples were collected from the TAA and the approved step-out locations in the excavation sidewalls and floor. Due to the steep, dry, sandy, unconsolidated nature of the hillsides, geotextile was placed under riprap in the excavated areas.

- AOC 10 TAA1: AOC 10 TAA1 is located immediately southeast of the TCS visitor parking area on a steep slope between the TCS fence line and East Ravine. AOC 10 TAA1 received historical waste discharge from the TCS, including discharge from stormwater drainpipes, surface disposal of debris onto the slope, and incidental overflows of wastewater from the former trench drain along the TCS access road. Yellow and white discolored soil was present on the surface of the TAA. Historical chromium and hexavalent chromium concentration data for the yellow discolored soil indicated the soil had the potential to be hazardous waste, and metal- and D/F-contaminated soil was also present, with the greatest contaminant concentrations within 2 to 3 feet of the surface. Removal activities at AOC 10 TAA1 began in July 2023 and were completed in November 2023, resulting in the removal of approximately 2,311 cubic yards of contaminated soil (Section 3.8 of the NTCRA Completion Report [Jacobs 2025]). The discolored soil encountered at AOC 10 TAA1 was removed, except for the white material in the northwest under the TCS visitor parking lot, because this area is inside the TCS and outside the NTCRA work area boundary. White material also remains in some areas to the southeast in the channel heading toward East Ravine where it was not excavated due to concerns of undermining an active high-voltage electrical line. Forty confirmation soil samples were collected from AOC 10 TAA1 and the approved step-out locations in the excavation sidewalls and floor. In the steeply sloped areas, geotextile was placed under riprap in the excavated areas. Flat areas of the TAA requiring backfill, particularly the western edge of the TAA along the TCS fence line and the area southeast of TAA boundary, were backfilled with aggregate base material from Campbell's Quarry near Lake Havasu City, Arizona.

Soil exceeding the numerical removal action goals (RAGs) or debris remain in a few places associated with Soil NTCRA removals as well as a few isolated locations outside of the Soil NTCRA removal areas because it was beyond the maximum removal depth of the NTCRA or removing it may have presented a hazard to workers, undermined critical infrastructure or utilities, or encroached upon culturally sensitive resources. At the AOC 9 potential exposure area, depth-weighted location concentrations exceeding RAGs for hexavalent chromium, copper, and dioxin TEQ remain in place. Section 3 of the NTCRA Completion Report (Jacobs 2025) describes the remaining contamination in each target action area and provides a list of individual confirmation samples (i.e., non-depth-weighted) exceeding the RAGs (Table 3-16 of the NTCRA Completion Report). Figure 2-4 and Table 2-1 of the main Report provide the locations and concentrations, respectively, of the depth-weighted historical and confirmation sample concentrations exceeding the RAGs which include the following:

- Hexavalent chromium: AOC10a-1, AOC10a-3, AOC9-7, and AOC9-16;
- Copper: AOC10a-1; and
- Dioxin TEQ: AOC10a-3, AOC9-16, and AOC9-21.

2 DATA EVALUATION

This section summarizes the data considered for the AOC 9 potential exposure area Post-NTCRA HHERA and presents the constituents of potential concern (COPCs) for human health and constituents of potential ecological concern (COPECs) identified as risk drivers in the 2019 HHERA (Arcadis 2019) as well as non-risk-driving COPCs/COPECs evaluated for AOC 9.

For AOC 9, the 2019 HHERA (Arcadis 2019) identified potential exposure to dioxin TEQ and hexavalent chromium in surface (0 to 0.5 foot bgs) and shallow (0 to 3 feet bgs) soils as having risk above de minimus levels (i.e., 1 x 10^{-6} for excess lifetime cancer risk and 1 for noncancer hazard index [HI]; see Section 4) for one or more human recreational receptors. The 2019 HHERA identified total chromium, copper, and dioxin TEQ in surface soil (0 to 0.5 foot bgs) as having the potential for unacceptable risk to desert shrew in AOC 9 based on hazard quotients (HQs) greater than 1 and supporting lines of evidence (LOEs) indicating potential for risk (see Section 5). The soil samples associated with unacceptable risk were located primarily along the TCS fence line in the area of AOC 10a.

Consistent with the approach detailed in the January 30, 2024 Technical Memo (Arcadis 2024), the HHRA evaluated post-NTCRA exposures (i.e., considering NTCRA-related excavation and placement of backfill) to hexavalent chromium, total chromium, copper, and dioxin TEQ, and pre-NTCRA exposures for the remaining non-risk-driving COPCs (i.e., using exposure point concentrations [EPCs] from the 2019 HHERA [Arcadis 2019]). For the ERA, ecological receptor exposure was evaluated individually for each COPEC; evaluation of COPECs is limited to hexavalent chromium, total chromium, copper, and dioxin TEQ (identified as risk-driving COPECs in one or more site AOCs).

The data evaluation steps for these risk-driving and non-risk-driving COPCs/COPECs are described in the sections that follow. Additionally, some additional data for non-risk-driving COPCs/COPECs were collected on a limited basis as part of the NTCRA and were evaluated as described in the sections that follow.

2.1 Data Evaluation for Risk-Driving COPCs and COPECs

For risk-driving COPCs (dioxin TEQ and hexavalent chromium) and COPECs (total chromium, copper, and dioxin TEQ) identified for AOC 9 in the 2019 HHERA (Arcadis 2019), all soil sampling locations currently in place (i.e., not excavated as part of the NTCRA) at AOC 9 were evaluated in this Post-NTCRA HHERA. The Post-NTCRA HHERA dataset for AOC 9 includes results for in-place samples evaluated in the 2019 HHERA (Arcadis 2019) and in-place NTCRA confirmation samples. It should be noted that additional NTCRA data for other non-risk-driving constituents are discussed in Section 2.3.

All soil sampling locations currently in place at AOC 9 (and AOC 10a) are presented on Figure AOC9-1.2 and in Table AOC9-1.1. Details of the soil sampling and analysis conducted as part of the NTCRA are presented in the NTCRA Completion Report (Jacobs 2025); details of the soil sampling and analysis for the remaining samples are described in the RAWP documents (Arcadis 2008, 2009, 2015) and 2019 HHERA (Arcadis 2019). For the baseline scenario, only soil data from 0 to 3 feet bgs were evaluated in this Post-NTCRA HHERA to account for potential soil exposures for risk-driving receptors (i.e., camper, hiker, OHV rider, and desert shrew), which may occur at surface soils (e.g., 0 to 0.5 foot bgs) or shallow soils (e.g., 0 to 3 feet bgs). Because potential soil contact does not extend below 3 feet bgs for the baseline scenario, deeper soil data (i.e., greater than 3 feet bgs) were excluded from the risk evaluation, as noted in Table AOC9-1.1.

Following the steps outlined in Section 3 of the main report, soil data considered usable for the risk assessment were identified and used in the quantitative HHERA. Samples representing soil that was excavated as part of the NTCRA were excluded from the dataset, and current sample top and bottom depths (reflecting excavation and/or placement of fill material) were used (Table AOC9-1.1). The post-NTCRA soil data are presented in Attachment AOC9-A1 and include the following:

- Pre-NTCRA Data: For pre-NTCRA data, the dataset includes results for site risk drivers (i.e., hexavalent chromium, total chromium, copper, and dioxin TEQ) from the 2019 HHERA dataset (Arcadis 2019) where those samples remain in place.
- NTCRA Confirmation Sampling Data: The dataset includes results for site risk drivers (i.e., hexavalent chromium, total chromium, copper, and dioxin TEQ) from confirmation samples that currently remain in place.

2.2 Data Evaluation for Non-Risk-Driving COPCs

As noted above, EPCs for non-risk-driving COPCs used in the 2019 HHERA (Arcadis 2019) were also used in this Post- NTCRA HHERA, as calculated from the pre-NTCRA soil dataset. As discussed in Section 5.5.2 of the main report, use of pre-NTCRA soil data for non-risk-driving COPCs is a conservative approach that is likely to overestimate post-NTCRA concentrations of these COPCs. Thus, the data evaluation steps are as described in detail in Section 3 of the 2019 HHERA. The soil sampling locations for the 2019 HHERA dataset at AOC 9 are presented on Figure AOC9-1.1 and in Table AOC9-1.1 of the 2019 HHERA. The data were evaluated based on methodology described in the RAWP documents (Arcadis 2008, 2009, 2015). It should be noted that for this Post- NTCRA HHERA, only surface soil (0 to 0.5 foot bgs) and shallow soil (0 to 3 feet bgs) were evaluated.

Within this dataset, some analytical data did not meet data quality criteria; therefore, non-detect results were qualified as rejected with an “R” data qualifier (as discussed in RFI/RI Report Volume 3; Jacobs 2024). This occurred for one sample (AOC9-18-4111 at 5 to 6 feet bgs), where most Aroclor data were rejected (except for Aroclor 1254); however, it does not affect the surface and shallow soil datasets evaluated in this Post-NTCRA HHERA.

Data processed for the 2019 HHERA (e.g., calculation of total concentrations for low molecular weight and high molecular weight polycyclic aromatic hydrocarbons [PAHs], benzo(a)pyrene equivalent [B(a)PEQ], polychlorinated biphenyls [PCBs], and dioxin TEQ) are described in detail in Section 3 of the 2019 HHERA.

The process for identifying COPCs and COPECs is detailed in Section 3.4 of the 2019 HHERA (Arcadis 2019). COPCs and COPECs were selected for the AOC 9 potential exposure area using soil data encompassing all relevant exposure depths for the HHERA (i.e., 0 to 10 feet bgs for AOC 9) presented in Attachment AOC9-A1 to the 2019 HHERA. Metals, low molecular weight PAHs, high molecular weight PAHs, B(a)PEQ, and dioxin TEQ had concentrations above background levels in AOC 9 soil (0 to 10 feet bgs) and, therefore, are included as COPCs and/or COPECs in the baseline exposure depths evaluated in the HHERA. Carcinogenic PAHs (i.e., benzo(a)anthracene, B(a)PEQ, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, and indeno(1,2,3-cd)pyrene) associated with B(a)PEQ were also selected as COPCs in the HHRA for the evaluation of the noncancer endpoint for each individual PAH. All other detected organic constituents in the AOC 9 soil potential exposure area in the baseline exposure depths are included as COPCs and/or COPECs in the 2019 HHERA. COPCs and/or

COPECs selected for exposure depths and scenarios evaluated in the 2019 HHERA for AOC 9 and relevant to the applicable depths evaluated in this Post-NTCRA HHERA are summarized in Section 3.

2.3 Evaluation of Additional Data

In some cases, NTCRA confirmation samples were also analyzed for other constituents, including a few metals (lead, mercury, molybdenum, and zinc). These data were not included in the Post-NTCRA HHERA exposure estimates. Instead, measured concentrations of in-place confirmation samples were compared to the range of concentrations observed in the 2019 HHERA dataset (Arcadis 2019). This evaluation is presented in Table AOC9-2.1 for the baseline scenario. The maximum and mean concentrations for the in-place NTCRA confirmation samples for lead, mercury, molybdenum, and zinc were less than the maximum and mean concentrations for these metals in the 2019 HHERA dataset.

This indicates that EPCs evaluated for lead, mercury, molybdenum, and zinc in the Post-NTCRA HHERA based on values calculated for the 2019 HHERA (Arcadis 2019) dataset are likely a conservative estimate of current post-NTCRA exposures in AOC 9. Exclusion of the in-place NTCRA confirmation samples for these constituents is not expected to materially change the risk estimates or conclusions of this Post-NTCRA HHERA.

3 EXPOSURE POINT CONCENTRATIONS

Depth-weighted and area-weighted EPCs for COPCs/COPECs in soil at the AOC 9 potential exposure area were calculated as described in Section 4.2 of the main report. As noted in Section 2, EPCs for hexavalent chromium, total chromium, copper, and dioxin TEQ were calculated from the post-NTCRA dataset. In addition, EPCs from the 2019 HHERA (Arcadis 2019) for non-risk-driving COPCs were used in this HHRA to estimate cumulative risks to human receptors. Consistent with the scenarios evaluated in the 2019 HHERA, one scenario was evaluated for the AOC 9 potential exposure area: Baseline (no scouring).

The following exposure depths were evaluated:

- Surface soil (0 to 0.5 foot bgs); and
- Shallow soil (0 to 3 feet bgs).

Deeper soil intervals were not evaluated because the risk-driving receptors are potentially exposed only to surface and shallow soil.

The depth-weighted data used in the calculation of depth-weighted EPCs for hexavalent chromium, total chromium, copper, and dioxin TEQ are presented in Attachment AOC9-A2. The summary statistics for these AOC 9 potential exposure area soil depth-weighted datasets and depth-weighted EPCs were calculated in a manner consistent with the RAWP documents (Arcadis 2008, 2009, 2015). In accordance with the RAWP, area-weighted EPCs for the HHRA were evaluated only if depth-weighted EPCs suggested that cumulative cancer risks and/or noncancer hazards may be significant for any given HHRA exposure scenario (cumulative cancer risks exceed a 1×10^{-6} cancer risk level and/or the noncancer HI exceeds 1). Similarly, for the ERA, area-weighted EPCs were evaluated for consistency with the scenarios evaluated in the 2019 HHERA but only discussed if depth-weighted EPCs suggested potential risk to potential ecological receptors (i.e., HQ greater than 1 for any COPEC). For the AOC 9 potential exposure area, area-weighted EPCs were deemed necessary for either the HHRA or the ERA and, therefore, were calculated. The area-weighted data used in the calculation of area-weighted EPCs and the Thiessen polygons figures representing the area-weighted EPCs are presented in Attachment AOC9-A3.

In some cases, the area-weighted EPCs are greater than the depth-weighted EPCs, such as for total chromium in surface soil for the baseline scenario in the AOC9 potential exposure area. In this case, the depth-weighted EPC for total chromium (37.84 milligrams per kilogram [mg/kg]) is based on a different upper confidence limit (UCL) method (95% adjusted gamma UCL) than the area-weighted EPC (43.6 mg/kg, calculated using the bias-corrected and accelerated bootstrap UCL method). Both UCL methods are noted by ProUCL to produce stable and unbiased UCL estimates that are unlikely to overestimate or underestimate the true expected UCL value (United States Environmental Protection Agency [USEPA] 2022). The difference in the UCL values (less than 25%) can be attributed to the effect of area-weighting as well as to the different UCL methods employed.

In accordance with the 2019 HHERA (Arcadis 2019), if the soil dataset had fewer than four detected values (i.e., concentrations reported above the detection limit) or fewer than eight total observations, the EPC defaulted to the maximum depth-weighted concentration in that dataset.

Table AOC 9-3.1 presents soil summary statistics for constituents measured at the AOC 9 potential exposure area and depth- and area-weighted EPCs for COPCs/COPECs calculated using depth-weighted data from the two exposure depths listed in this section. It should be noted that the list of constituents shown in Table AOC 9-3.1 is based on analytes that were detected at least once at the site (including all exposure areas inside or outside the TCS) in the 2019 HHERA (Arcadis 2019) and measured at AOC 9. Table AOC 9-3.1 also presents the basis of the calculated depth- and area-weighted EPCs, including whether the EPC is based on the maximum detected concentration.

4 HUMAN HEALTH RISK ASSESSMENT

This section briefly summarizes the HHRA approach used for this Post-NTCRA HHERA; presents the COPC, EPC, risk, and hazard summary tables; and discusses the results of the risk characterization and uncertainties in the risk assessment for the AOC 9 potential exposure area. Details of the overall HHRA approach are presented in Section 5 of the 2019 HHERA (Arcadis 2019). Dose, exposure concentration (EC), risk, and hazard calculation tables for potential human health receptors at the AOC 9 potential exposure area are presented in Attachment AOC9-B.

As stated in the 2019 HHERA (Arcadis 2019), risks/hazards estimated for an individual AOC, solid waste management unit (SWMU), or undesignated area (UA) potential exposure area like AOC 9 are not considered representative of the realistic or likely potential exposures for the human populations that could be present in the areas outside the TCS (such as recreational users). Risks/hazards calculated separately for individual AOCs are conservative and likely overestimate site risks/hazards. As described in the RAWP documents (Arcadis 2008, 2009, 2015), these human populations would more likely be exposed randomly, over the course of a lifetime, to soil present in all individual AOC/SWMU/UA potential exposure areas located outside the TCS, rather than have a lifetime of contact limited to the area of a single potential exposure area. Therefore, estimated risks/hazards presented for individual AOC/SWMU/UA potential exposure areas are not believed to be representative of the potential health risks to humans potentially contacting the soil outside the TCS. As stated previously, the Post-NTCRA HHERA provides updated risk estimates for human health and the environment based on potential exposures to current soil conditions in the NTCRA areas. Therefore, updated risk estimates were not performed for the OCS potential exposure area in the Post-NTCRA HHERA It is noted that due to NTCRA soil removal, the potential post-NTCRA soil risks for the OCS are likely lower than estimated in the 2019 HHERA. The HHRA results and conclusions of the 2019 HHERA and of this Post-NTCRA HHERA will be considered for making risk-management decisions for the site in the Corrective Measure Study/Feasibility Study to be prepared for the site.

4.1 Human Health Conceptual Site Model

Following the steps outlined in Section 5.5 of the 2019 HHERA (Arcadis 2019), updated risks were estimated for potentially complete and significant exposure pathways identified in the human health conceptual site model for risk-driving receptors potentially exposed to COPCs in soil present at the AOC 9 potential exposure area, as identified in the 2019 HHERA. These included incidental ingestion of soil, dermal contact with soil, and inhalation of particulates and VOC vapors in ambient outdoor air from soil for recreational users (child and/or adult campers, hikers, and OHV riders).

Potential exposure pathways considered incomplete or insignificant were not quantitatively evaluated and are discussed in Section 5.3.1 of the 2019 HHERA (Arcadis 2019).

4.2 Constituents of Potential Concern

COPCs for the AOC 9 potential exposure area were selected in accordance with the RAWP documents (Arcadis 2008, 2009, 2015) and as described in Section 3.4 of the 2019 HHERA (Arcadis 2019). COPCs for the AOC 9 potential exposure area evaluated in this Post-NTCRA HHERA are the same as the COPCs for

the AOC 9 potential exposure area evaluated in the 2019 HHERA. The COPC selection process using soil data encompassing all relevant exposure depths for this Post- NTCRA HHERA (i.e., 0 to 6 feet bgs for AOC 9) are presented in Attachment AOC9-A of the 2019 HHERA. COPCs for the two exposure depths (surface and shallow) and one scenario (baseline) evaluated for the AOC 9 HHRA in this Post- NTCRA HHERA are summarized in Table AOC9-4.1. COPCs selected for Subsurface II soil in the 2019 HHERA are also shown in Table AOC9-4.1, however, only the EPCs for volatile compounds for these depth intervals are used in the estimates of outdoor vapor concentrations in the quantitative HHRA for the evaluation of the outdoor vapor inhalation pathway. The EPCs for COPCs for Subsurface II soil were not updated in this this Post- NTCRA HHERA and are the same as presented in the 2019 HHERA.

COPCs included metals (antimony, arsenic, hexavalent chromium, total chromium, copper, lead, mercury, nickel, thallium, and zinc), one VOC (isophorone), PAHs, one pesticide (4,4-dichlorodiphenyldichloroethylene [4,4-DDE]), PCBs, total petroleum hydrocarbons (TPHs) as diesel, TPH as motor oil, and dioxin TEQ in surface and shallow soils.

4.3 Exposure Point Concentration Summary

For the potentially complete and significant exposure pathways identified in the conceptual site model, EPCs were calculated as described in Section 4.2 of the main report and presented in Section 3 of this appendix. Depth-weighted data used in the calculation of depth-weighted and area-weighted EPCs are presented in Attachment AOC9-A. Depth- and area-weighted EPCs for COPCs in soil and estimated outdoor air concentrations associated with dust and vapors and used to estimate risk in the HHRA are summarized in Tables AOC9-4.2a and AOC9-4.2b and Tables AOC9-4.3a and AOC9-4.3b, respectively, for the two exposure depths evaluated.

As described in detail in Section 5.3.3 of the 2019 HHERA(Arcadis 2019), surface and shallow soil exposure depths and corresponding EPC datasets for recreational users (child and/or adult campers, hikers, hunters, and OHV riders) were used to evaluate potential exposure to COPCs in soil for potential human receptors identified as risk-driving receptors in the 2019 HHERA.

4.4 Estimation of Exposure Dose

The EC and chronic daily intake (CDI) for potential carcinogenic and noncarcinogenic effects were calculated, as described in Section 5.5.1 of the 2019 HHERA(Arcadis 2019), for COPCs in soil for potentially complete exposure pathways. The calculated EC and CDI values using depth-weighted EPCs are presented in Tables AOC9-B1.1a through AOC9-B1.1c (carcinogenic effects) and Tables AOC9-B1.2a through AOC9-B1.2c (noncarcinogenic effects) in Attachment AOC9-B for the potential receptors evaluated. The calculated EC and CDI values using area-weighted EPCs are presented in Tables AOC9-B2.1a through AOC9-B2.1c (carcinogenic effects) and Tables AOC9-B2.2a through AOC9-B2.2c (noncarcinogenic effects) in Attachment AOC9-B for the potential receptors evaluated. Exposure parameters for recreational users used in the dose calculations were presented in Table 5-1 of the 2019 HHERA and are presented in Table 5-1 of the main report.

4.5 Toxicity Assessment

The toxicity assessment characterizes the relationship between the magnitude of exposure to a constituent and the potential for adverse health effects. More specifically, the toxicity assessment identifies agency-promulgated or derived toxicity values that can be used to estimate the likelihood of adverse health effects occurring in humans at different exposure levels. The approach for the toxicity assessment was provided in Section 4.5 of the RAWP (Arcadis 2008) and in Section 4.2 of the Final Human Health and Ecological Risk Assessment Work Plan Addendum 2 (Arcadis 2015). In a manner consistent with regulatory risk assessment policy, adverse health effects resulting from potential chemical exposures were evaluated in two categories: carcinogenic effects and noncarcinogenic effects. The hierarchy of sources for the toxicity criteria to be used for this Post-NTCRA HHERA has been updated from the 2019 HHERA and is compliant with the September 4, 2018, "Toxicity Criteria for Human Health Risk Assessments, Screening Levels, and Remediation Goals" rule (Title 22, California Code of Regulations, Sections 68400.5, 69020-69022). Toxicity values for carcinogenic and noncarcinogenic effects for COPCs selected and used for the HHRA are described in Section 5.3 of the main report and were used to estimate potential cancer risks and noncancer hazards described in this Post-NTCRA HHERA.

4.6 Human Health Risk Characterization

For potential human receptors, assuming lifetime soil exposure is limited to the AOC 9 potential exposure area, the estimated incremental lifetime cancer risks (ILCRs) and/or noncancer HQs were calculated for each COPC and potentially complete exposure pathway. Estimated cumulative ILCRs (i.e., sum of chemical-specific ILCRs for each exposure depth for a scenario) were calculated and compared to the DTSC point of departure for a risk management decision of 1×10^{-6}. It should be noted that risk management decisions may increase this criterion depending on site-specific conditions. As indicated in the National Oil and Hazardous Substances Pollution Contingency Plan (40 Code of Federal Regulations 300), cancer risks between a one in a million and a one hundred in a million probability of occurrence (1×10^{-6} and 1×10^{-4}) fall within a risk management range that is generally referred to as the acceptable risk range. Within this estimated cancer risk range, there is flexibility for risk managers in deciding what action, if any, is necessary and appropriate for the protection of human health. The Fish and Wildlife's cancer risk threshold level is ten in a million (1×10^{-5}) for soil deeper than 2 feet below ground surface (February 12, 2021 Topock Soil EE/CA Response to Comment Consultation Meeting Agenda). Estimated cumulative noncancer hazards (i.e., HIs) are calculated and compared to an HI of 1 (DTSC 2015). Chemical exposures that yield HIs of less than or equal to 1 are not expected to result in adverse noncancer health effects (USEPA 1989).

4.6.1 Risk Characterization for Exposure to Soil (Baseline Scenario and Depth-Weighted EPCs)

Table AOC9-4.4 summarizes cumulative ILCRs and HIs estimated for exposure to soil for each potential human receptor at the AOC 9 potential exposure area, calculated using depth-weighted EPCs. The dose, EC, ILCR, and HI equations are presented in detail in Section 5.5 of the 2019 HHERA (Arcadis 2019). The detailed cancer risk estimates (Tables AOC9-B1.3a through AOC9-B1.3c) and noncancer hazard calculations (Tables AOC9-B1.4a through AOC9-B1.4c) are presented in Attachment AOC9-B.

Risk and hazard estimates for the AOC 9 potential exposure area are summarized in Exhibit AOC 9-4.1 and discussed in this section. Assuming lifetime soil contact is limited to the AOC 9 potential exposure area, the depth-weighted estimated cumulative HIs for the recreational users (camper, hiker, and OHV rider) potentially exposed to COPCs in AOC 9 soil at all exposure depths are at or below 1. The depth-weighted estimated cumulative ILCRs for the recreational users (camper, hiker, and OHV rider) exposed to COPCs in surface and shallow soils are above the point of departure for risk management decisions of 1×10^{-6}, but within the risk management range of 1×10^{-6} and 1×10^{-4}. The depth-weighted estimated cumulative ILCRs are also below the Fish and Wildlife's cancer risk threshold level of 1×10^{-5} for soil deeper than 2 feet below ground surface (February 12, 2021 Topock Soil EE/CA Response to Comment Consultation Meeting Agenda).

Exhibit AOC 9-4.1 Baseline Depth-Weighted Estimated Cumulative Incremental Lifetime Cancer Risk and Hazard Index for the AOC 9 Potential Exposure Area for Recreational Users

Potential Receptor	Exposure Depth	Cumulative ILCR	ILCR Drivers	HI	HI Drivers
Camper	Surface	3E-06	Arsenic (2E-06) TEQ for humans (5E-07) B(a)PEQ (3E-07) hexavalent chromium (2E-07)	0.6	NA
Camper	Shallow	3E-06	Arsenic (2E-06) TEQ for humans (4E-07) B(a)PEQ (2E-07) hexavalent chromium (1E-07)	0.6	NA
Hiker	Surface	6E-06	Arsenic (4E-06) TEQ for humans (1E-06) B(a)PEQ (6E-07) hexavalent chromium (5E-07)	1	NA
Hiker	Shallow	5E-06	Arsenic (4E-06) TEQ for humans (8E-07) B(a)PEQ (4E-07) hexavalent chromium (3E-07)	1	NA
OHV rider	Surface	4E-06	Arsenic (2E-06) hexavalent chromium (1E-06) TEQ for humans (5E-07) B(a)PEQ (4E-07)	0.3	NA
OHV rider	Shallow	3E-06	Arsenic (2E-06) hexavalent chromium (5E-07) TEQ for humans (4E-07) B(a)PEQ (3E-07)	0.3	NA

Notes:
1. ILCR and HI drivers are presented only for estimated cumulative ILCRs above 1×10^{-6} and estimated HIs above 1.

Assuming lifetime soil contact is limited to the AOC 9 potential exposure area, the depth-weighted estimated cumulative ILCRs for the camper, hiker, and OHV rider potentially exposed to COPCs in surface and shallow

soil are above the point of departure for risk management decisions of 1×10^{-6}, but at or within the risk management range of 1×10^{-6} and 1×10^{-4}. The depth-weighted estimated cumulative ILCRs are also below the Fish and Wildlife's cancer risk threshold level of 1×10^{-5} for soil deeper than 2 feet below ground surface (February 12, 2021 Topock Soil EE/CA Response to Comment Consultation Meeting Agenda). For the camper and hiker, risk estimates above de minimis levels were primarily attributed to arsenic, hexavalent chromium, B(a)PEQ, and/or dioxin TEQ in soil via the soil ingestion pathway. For the OHV rider, arsenic, B(a)PEQ, and dioxin TEQ are driven by dermal contact with soil, and hexavalent chromium is driven by inhalation of particulates (Tables AOC9-B1.3a through AOC9-B1.3c in Attachment AOC9-B). It is important to note that a substantial proportion of the depth-weighted estimated ILCRs for arsenic for the camper (1.6×10^{-6} of 2×10^{-6} or approximately 80%), hiker (3.1×10^{-6} of 4×10^{-6} or approximately 78%), and OHV rider (1.7×10^{-6} of 2×10^{-6} or approximately 85%) potentially exposed to COPCs in surface and shallow soil are attributed to background concentrations of arsenic in soil. The cumulative ILCRs for the camper (surface and shallow soil), hiker (shallow soil), and OHV rider (surface and shallow soil) excluding contribution from background arsenic concentrations would be at the point of departure for risk management decisions of 1×10^{-6}.

Assuming lifetime soil contact is limited to the AOC 9 potential exposure area, the depth-weighted estimated HIs for the camper, hiker, and OHV rider potentially exposed to COPCs in surface and shallow soil are at or below an HI of 1 (Tables AOC9-B1.4a, AOC9-B1.4b, and AOC9-B1.4c, respectively, in Attachment AOC9-B). The depth-weighted EPCs for lead in surface and shallow soil at the AOC 9 potential exposure area are not expected to result in an increase in blood lead levels above the Office of Environmental Health Hazard Assessment (OEHHA) benchmark value of 1 microgram per deciliter (µg/dL) for child recreational users (Tables AOC9-B1.5a through AOC9-B1.5f in Attachment AOC9-B).

4.6.2 Risk Characterization for Exposure to Soil (Baseline Scenario and Area-Weighted EPCs)

Table AOC9-4.5 summarizes the cumulative ILCRs and HIs estimated for exposure to soil for each potential human receptor at the AOC 9 potential exposure area, calculated using area-weighted EPCs, for potential receptors where the depth-weighted estimated cumulative ILCRs and/or HIs were above 1×10^{-6} and 1, respectively. Therefore, area-weighted ILCRs and HIs were estimated for the recreational users (camper, hiker, and OHV rider). The dose, EC, ILCR, and HI equations are presented in detail in Section 5.5 of the 2019 HHERA (Arcadis 2019). The detailed cancer risk estimates (Tables AOC9-B2.3a through AOC9-B2.3c) and noncancer hazard calculations (Tables AOC9-B2.4a through AOC9-B2.4c) are presented in Attachment AOC9-B.

Area-weighted estimated cumulative ILCRs and HIs for each potential receptor selected for evaluation are summarized in Exhibit AOC 9-4.2 and discussed in this section. In general, the area-weighted approach resulted in a reduction in the risk or hazard estimates ranging from 1.2 to 1.3 times lower than the depth-weighted estimates.

Exhibit AOC9-4.2 Baseline Area-Weighted Estimated Cumulative Incremental Lifetime Cancer Risk and Hazard Index for the AOC 9 Potential Exposure Area for Recreational Users

Potential Receptor	Exposure Depth	Cumulative ILCR	ILCR Drivers	HI	HI Drivers
Camper	Surface	2E-06	Arsenic (2E-06) TEQ for humans (5E-07) B(a)PEQ (1E-07) hexavalent chromium (2E-07)	0.5	NA
Camper	Shallow	2E-06	Arsenic (2E-06) TEQ for humans (4E-07) B(a)PEQ (1E-07) hexavalent chromium (1E-07)	0.5	NA
Hiker	Surface	5E-06	Arsenic (3E-06) TEQ for humans (1E-06) B(a)PEQ (3E-07) hexavalent chromium (3E-07)	1	NA
Hiker	Shallow	4E-06	Arsenic (3E-06) TEQ for humans (7E-07) B(a)PEQ (2E-07) hexavalent chromium (2E-07)	1	NA
OHV rider	Surface	3E-06	Arsenic (2E-06) hexavalent chromium (7E-07) TEQ for humans (5E-07) B(a)PEQ (2E-07)	0.2	NA
OHV rider	Shallow	3E-06	Arsenic (2E-06) hexavalent chromium (5E-07) TEQ for humans (4E-07) B(a)PEQ (1E-07)	0.2	NA

Note:
1. ILCR and HI drivers are presented only for estimated cumulative ILCRs above 1×10^{-6} and estimated HIs above 1.

Assuming lifetime soil contact is limited to the AOC 9 potential exposure area, the area-weighted estimated cumulative ILCRs for the camper, hiker, and OHV rider potentially exposed to COPCs in surface and shallow soils are above the point of departure for risk management decisions of 1×10^{-6}, but at or within the risk management range of 1×10^{-6} and 1×10^{-4}. The area-weighted estimated cumulative ILCRs are also below the Fish and Wildlife's cancer risk threshold level of 1×10^{-5} for soil deeper than 2 feet below ground surface (February 12, 2021 Topock Soil EE/CA Response to Comment Consultation Meeting Agenda). For the camper and hiker, risk estimates above de minimis levels were primarily attributed to arsenic, hexavalent chromium, B(a)PEQ, and/or dioxin TEQ in soil via the soil ingestion pathway. For the OHV rider, arsenic, B(a)PEQ, and dioxin TEQ are driven by dermal contact with soil, and hexavalent chromium is driven by inhalation of particulates (Tables AOC9-B2.3a through AOC9-B2.3c in Attachment AOC9-B). It is important to note that a substantial proportion of the area-weighted estimated ILCRs for arsenic (approximately 82%) for the camper, hiker, and OHV rider potentially exposed to COPCs in surface and shallow soil are attributed to

background concentrations of arsenic in soil. The cumulative ILCRs for the camper, hiker, and OHV rider (surface and shallow soil) excluding contribution from background arsenic concentrations would be at or below the point of departure for risk management decisions of 1×10^{-6}.

The area-weighted estimated cumulative HIs for the camper, hiker, and OHV rider potentially exposed to COPCs in surface and shallow soil at the AOC 9 potential exposure area are at or below an HI of 1 (Tables AOC9-B2.4a through AOC9-B2.4c in Attachment AOC9-B). The area-weighted EPCs for lead in surface and shallow soil at the AOC 9 potential exposure area are not expected to result in an increase in blood lead levels above the OEHHA benchmark value of 1 µg/dL for child recreational users (Tables AOC9-B2.5a through AOC9-B2.5f in Attachment AOC9-B).

4.6.3 Uncertainties in the Risk Assessment

The risk assessment includes several uncertainties that warrant discussion. Many of the assumptions used in this risk assessment regarding the representativeness of the sampling data, potential human exposures, fate and transport modeling, and chemical toxicity are conservative, follow agency guidance, and reflect a 90th or 95th percentile value rather than a typical or average value. The use of several conservative exposure assumptions and toxicity estimates can introduce considerable uncertainty into the risk assessment. By using conservative exposure assumptions or toxicity estimates, the assessment can develop a significant conservative bias that may result in the calculation of significantly higher estimates for cancer risks or noncancer hazards than are actually posed by the chemicals present in soil. These uncertainties are discussed in detail in Section 5.6 of of the 2019 HHERA (Arcadis 2019). Uncertainties applicable only to the risk assessment for the AOC 9 potential exposure area are discussed in detail in this section.

Additional uncertainties for the AOC 9 potential exposure area include the use of the maximum depth-weighted soil concentration as the EPC. The maximum depth-weighted soil concentration was used for COPCs when the soil dataset had fewer than four detected values (i.e., concentrations reported above the detection limit) or fewer than eight total observations as shown in Table AOC9-3.1.

For the AOC 9 potential exposure area, the maximum depth-weighted concentration was used as the EPC for the following COPCs:

- Surface soil: metals (antimony and cadmium), one semi-volatile organic compound (isophorone), PAHs (1-methylnaphthalene, 2-methylnaphthalene, acenaphthene, acenaphthylene, fluorene, and naphthalene), and one pesticide (4,4-DDE); and
- Shallow soil: metals (antimony and thallium), one semi-volatile organic compound (isophorone), PAHs (acenaphthylene and fluorene), and one pesticide (4,4-DDE).

The use of the maximum depth-weighted soil concentration as the EPC for the COPCs listed in this section may not appropriately represent exposures and resulting risks/hazards. This approach to estimating EPCs does not materially impact the results of the HHRA because the AOC 9 potential exposure area COPCs with low frequency of detection and/or fewer than eight observations are not risk drivers at the site.

This baseline risk assessment assumes that contact with soil is not limited by the presence of engineering or institutional controls in the future. The potential health risks estimated for recreational users do not account for potential vegetative covering, unsuitable topography (e.g. steep slopes) and backfill material cover placed during or after completion of NTCRA activities outside the TCS that would reduce exposure below that

assumed in this analysis. In addition, as recommended by DOI (Arcadis 2015), it is assumed that each of the recreational activities could take place at any location on federal land. However, specific locations may be preferred for certain activities, while other locations may be less attractive or may have limited recreational options. AOC 9, also referred to as the Southeast Fence Line is located entirely on property owned by PG&E in the southeast portion of the TCS east (outside) of the facility fence line and just south of the visitor parking lot on a steep slope as shown on Figure A O C 9-1.1. In accordance with the RAWP (Arcadis 2008), and due to its proximity and topography, AOC 10a has been included as part of the AOC 9 evaluation for the 2019 HHERA and this Post- NTCRA HHERA. Since AOC 10a and AOC 9 are close to each other, the same small wildlife populations can be expected to forage across both AOC s as a consolidated exposure area. AOC 9 potential exposure area is on a very steep slope and covered in large riprap under post- NTCRA conditions. As such, access to AOC 9 is limited and not attractive for recreational activities. As such, the estimated risks are likely overestimated.

5 ECOLOGICAL RISK ASSESSMENT

This section briefly summarizes the ERA approach evaluated in this Post-NTCRA HHERA; presents the COPECs, EPCs, dose and risk tables for the post-NTCRA AOC 9 ERA; and characterizes potential risk to desert shrew exposed to COPECs in soil currently present at the AOC 9 potential exposure area. Details of the overall post-NTCRA ERA approach are presented in Section 6 of the main report. Supporting tables for the AOC 9 ERA based on risk calculations conducted using depth-weighted and area-weighted EPCs are presented in Attachment AOC9-C and described in this section.

Ecological risks were not calculated using maximum depth-weighted concentrations because they would be considered overly conservative and would generally be used for screening level purposes. Maximum concentrations were not used for making risk management decisions for the NTCRA at the AOC 9 potential exposure area and were not evaluated in this ERA.

5.1 Ecological Conceptual Site Model

In the 2019 HHERA (Arcadis 2019), risks were estimated for potentially complete and significant exposure pathways identified for a suite of potential ecological receptors exposed to COPECs in soil at the AOC 9 potential exposure area. These included plants, invertebrates, and small home-range receptors (Merriam's kangaroo rat, desert shrew, cactus wren, and Gambel's quail). Potential large home-range receptors (desert kit fox, red-tailed hawk, and Nelson's desert bighorn sheep) were evaluated for two larger potential exposure areas (combined AOCs/investigation areas). These larger potential exposure areas included (1) all AOCs outside the TCS, and (2) all AOCs outside the TCS except Bat Cave Wash and AOC 4. Semi-quantitative and qualitative evaluations for special-status species were also conducted, as described in the 2019 HHERA.

The 2019 HHERA (Arcadis 2019) concluded that potential risk to ecological receptors, including special-status species, in AOC 9 and the larger potential exposure area relevant to large home-range receptors was limited to desert shrew potentially exposed to total chromium, copper, and dioxin TEQ in surface soil. Therefore, this Post-NTCRA HHERA presents risk estimates for desert shrew and total chromium, copper, and dioxin TEQ in surface soil that reflect current conditions in AOC 9 following soil remediation associated with the NTCRA. For transparency and consistency, risk estimates for hexavalent chromium were also included to evaluate post-NTCRA conditions because this constituent was identified as a risk driver for some other site AOCs.

The exposure assumptions for desert shrew, which are consistent with the 2019 HHERA (Arcadis 2019), are as follows: desert shrew—representative of invertivorous small mammal populations—are exposed only to surface soil (incidental and through biota uptake).

5.2 Constituents of Potential Ecological Concern

Consistent with the approach for the Post-NTCRA HHERA detailed in the January 30, 2024 Technical Memo (Arcadis 2024), updated risk estimates are only presented for risk-driving receptors and COPECs. For AOC 9, this includes desert shrew and total chromium, copper, and dioxin TEQ. Risk estimates for desert shrew are also provided for hexavalent chromium to evaluate post-NTCRA conditions.

5.3 Exposure Point Concentration Summary

Soil EPCs were calculated as described in Section 4.2 of the main report and presented in Section 3 of this Post- NTCRA HHERA. For the AOC 9 potential exposure area, risks to desert shrew were estimated using depth-weighted EPCs and area-weighted EPCs. Depth-weighted data used in the calculation of depth-weighted EPCs are presented in Attachment AOC9-A2. Area-weighted data used in the calculation of area-weighted EPCs are presented in Attachment AOC9-A3.

Biota tissue (i.e., terrestrial invertebrate) EPCs were calculated from the soil EPCs using soil-to-biota uptake relationships (i.e., bioaccumulation factors [BAFs]) for invertebrates, as described in Section 6.4.3 of the main report. As described in Section 6.4.2 of the main report, the surface soil (e.g., 0 to 0.5 foot bgs) depth interval was selected to represent exposure to soil and biota tissue for the risk calculations for desert shrew. For dioxin TEQ, the BAFs selected in the RAWP (Arcadis 2008) are based on uptake of a single congener: 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD). Because of the uncertainty associated with use of a single congener-based BAF (e.g., differences in congener uptake due to differences in their structure and physico-chemical properties are ignored), dioxin TEQ uptake was also estimated using two congener-specific approaches: congener-specific BAFs for soil invertebrates from USEPA (1999) and congener-specific BAFs for soil invertebrates from Fagervold et al. (2010), as discussed in Section 6.4.3.2 of the main report.

Depth-weighted soil EPCs and biota tissue EPCs calculated from depth-weighted soil EPCs are presented in Table AOC9-5.1 for the baseline scenario. Similarly, area-weighted soil EPCs and biota tissue EPCs calculated from area-weighted soil EPCs are presented in Table AOC9-5.2 for the baseline scenario. The alternate congener-specific BAFs and resulting biota tissue EPCs are presented in Table AOC9-5.3.

Risk calculations based on depth-weighted UCLs and area-weighted UCLs for each COPEC are provided. As mentioned earlier, use of the maximum depth-weighted concentrations results in overly conservative risks and is not considered for evaluation of post-NTCRA exposures.

5.4 Estimation of Exposure Dose

Potential exposures for wildlife (i.e., desert shrew) are quantified as doses (e.g., in units of mg/kg body weight per day). Exposure doses for COPECs in soil and potentially complete pathways were calculated using the equations as described in Section 6.4.3 of the main report. The exposure parameters selected to evaluate wildlife in this ERA include upper bound values from literature (e.g., ingestion rates) or assumed (e.g., 100% of one type of diet), which may result in conservative estimates of exposure dose and potential overestimation of actual exposure at the site.

For desert shrew, doses were calculated using the exposure parameters and equations presented in Section 6.4.3 of the main report. Exposure doses were calculated using the depth-weighted soil and biota tissue EPCs presented in Table AOC9-5.1 for the depth-weighted risk evaluations, and using the area-weighted soil and biota tissue EPCs presented in Table AOC9-5.2 for the area-weighted risk evaluations. Alternate congener-specific BAFs and resulting biota tissue EPCs are presented in Table AOC9-5.3.

Dose calculations using depth-weighted EPCs for desert shrew potentially exposed to COPECs via ingestion of soil and biota tissue for the baseline scenario are presented in Attachment AOC9-C. Dose calculations using area-weighted EPCs for desert shrew potentially exposed to COPECs via ingestion of soil and biota tissue for the baseline scenario are also presented in Attachment AOC9-C.

5.5 Effects Assessment

Dose-based toxicity reference values (TRVs) for wildlife for COPECs were used to estimate risks to desert shrew potentially exposed to COPECs in soil and biota tissue at the AOC 9 potential exposure area. A range of risks to desert shrew was estimated using the TRVs based on a no-observed adverse effects level (NOAEL) and based on a lowest-observed adverse effects level (LOAEL). For hexavalent chromium, total chromium, and copper, the NOAEL- and LOAEL-based TRVs used in this Post-NTCRA HHERA are the selected TRVs from the RAWP documents (Arcadis 2008, 2009, 2015).

For dioxin TEQ, the selected mammalian TRVs in the RAWP documents (Arcadis 2008, 2009, 2015) are from Toxicological Benchmarks for Wildlife from Oak Ridge National Laboratory (Sample et al. 1996). However, as described in Section 6.5 of the main report, an alternate set of mammalian TRVs were evaluated consistent with the 2019 HHERA (Arcadis 2019). Following the approach used by USEPA in developing TRVs for the ecological soil screening levels (USEPA 2008), alternate dioxin TEQ TRVs were developed for mammals based the geometric mean of the reproduction and growth endpoints for the NOAEL and LOAEL, respectively. These alternate TRVs for dioxin TEQ, presented in Section 6.5 of the main report, were used to estimate potential risk to desert shrew in this Post-NTCRA HHERA.

The LOAEL-based TRVs used in this Post-NTCRA HHERA are the same as the TRVs used to develop ecological risk-based remedial goals (RBRGs) in the 2019 HHERA (Arcadis 2019); RAGs selected based on the RBRGs were then used to define the extent of NTCRA soil removals.

Although other additional sets of TRVs (i.e., Navy/Biological Technical Assistance Group [BTAG] TRVs [DTSC 2002, 2009] were also evaluated in the 2019 HHERA (Arcadis 2019), BTAG TRVs are not available for hexavalent chromium, total chromium, or dioxin TEQ and they were ultimately not used for making remedial decisions. BTAG TRVs were not evaluated in this Post-NTCRA HHERA.

Wildlife TRVs used for RBRG development are presented in Table 6-4 of the main report.

5.6 Ecological Risk Characterization

The risk characterization integrates the results of the exposure assessment and effects assessment and is subject to uncertainties in both of those efforts. Risk characterization includes two major components: risk estimation and risk description. As presented in the tables and discussed in this section, risk estimates (i.e., HQs) involved the integration of exposure profiles with the exposure-effects information. For each potential receptor and COPEC, risk descriptions including various LOEs and uncertainties, (including HQs), supporting statistical and site use information, and the direction of uncertainty in the risk estimates are discussed in this section for interpreting the risk results and identifying potential unacceptable risk to potential ecological receptors. Uncertainties specific to the AOC 9 potential exposure area are discussed in context with the risk characterization results presented in this section. Generic uncertainties in the ERA are discussed in Section 6.7 of the main report.

The 2019 HHERA (Arcadis 2019) concluded that potential risk to ecological receptors, including special-status species, in AOC 9 and the larger exposure areas relevant to large home-range receptors was limited to desert shrew potentially exposed to total chromium, copper, and dioxin TEQ in surface soil. Therefore, this Post-NTCRA HHERA presents risk estimates for desert shrew and total chromium, copper, and dioxin TEQ in surface soil that reflect current conditions in the AOC 9 potential exposure area following soil remediation

associated with the NTCRA. Risk estimates for hexavalent chromium are also included to evaluate post-NTCRA conditions.

For desert shrew, a range of HQs was calculated using NOAEL- and LOAEL-based TRVs in this Post-NTCRA HHERA (see Section 5.5). HQs based on LOAEL-based TRVs are referred to as "LOAEL-based HQs." HQs based on NOAEL-based TRVs are referred as "NOAEL-based HQs." As noted above, the 2019 HHERA (Arcadis 2019) did not identify a potential for unacceptable risk to sensitive species, and therefore protection of individual invertivorous small mammals is not warranted. This Post-NTCRA HHERA presents NOAEL-based HQs for completeness; however, LOAEL-based HQs were used to evaluate population-level protection of invertivorous small mammals.

Risk conclusions for populations of desert shrew used the following criteria:

- COPECs with NOAEL-based HQs less than or equal to 1 pose de minimis risk to individuals and populations of potential wildlife receptors.
- COPECs with a NOAEL-based HQ greater than 1 but a LOAEL-based HQ less than or equal to 1 pose no unacceptable risks to wildlife populations. As described in the RAWP (Arcadis 2008), unacceptable risk to individuals is uncertain because the NOAEL-based TRVs are thresholds with an interval that is an artifact of the dosing study, and the nature and magnitude of the effects, if any, that may occur at exposures between these values are unknown. Because protection at the individual level is not warranted for desert shrew, COPECs with NOAEL-based HQs greater than 1 and LOAEL-based HQs less than 1 were not further evaluated using a weight-of-evidence (WOE) approach.
- COPECs with LOAEL-based HQs greater than 1 indicate unacceptable risk is possible for populations of potential wildlife receptors. However, these LOAEL-based HQs are based on individual-level effects thresholds and only account for a single LOE. In such cases, a WOE approach was used in reducing uncertainty for characterizing potential risk to wildlife populations at the AOC 9 potential exposure area.

Ultimately, three risk outcomes are possible for desert shrew based on the LOAEL-based HQs greater than 1 and WOE: (1) unacceptable risk to wildlife populations is possible (i.e., indicated by sufficient and strong supporting LOEs), (2) unacceptable risk to wildlife populations is unlikely (i.e., indicated by sufficient and strong LOEs supporting a conclusion of no unacceptable risk), or (3) unacceptable risk to wildlife populations is uncertain (i.e., indicated by insufficient LOEs). The results of individual LOE evaluations were evaluated collectively to derive an overall WOE conclusion. Key uncertainties were considered along with the strength, relevance, and other qualities of the LOEs in reaching the WOE conclusions. In this post-NTCRA ERA, the additional LOEs were evaluated and discussed when LOAEL-based HQs greater than 1 were estimated.

For the AOC 9 potential exposure area, evaluations were completed for the following scenarios:

- Baseline scenario using depth-weighted EPCs; and
- Baseline scenario using area-weighted EPCs.

In these evaluations, risk calculations were completed for hexavalent chromium, total chromium, copper, and dioxin TEQ, as presented summarized in Table AOC9-5.4, using depth-weighted EPCs, Table AOC9-5.5, using area-weighted EPCs, and Table AOC9-5.6, using depth-weighted EPCs and refined BAFs for dioxin TEQ. Risk results were discussed in the evaluations using area-weighted EPCs only if the depth-weighted EPC evaluation indicated potential for unacceptable risk to desert shrew populations. For example, COPECs

with LOAEL-based HQs greater than 1 based on the depth-weighted EPCs were discussed in the area-weighted EPC evaluations. If any COPECs were identified with LOAEL-based HQs greater than 1 in the area-weighted EPC evaluations that had HQs less than 1 in the depth-weighted evaluations, these results were also discussed in the area-weighted EPC evaluation.

At the conclusion of the baseline scenario evaluation, risk conclusions were based on whether COPECs remain for which unacceptable population-level risk was predicted using LOAEL-based HQs calculated from the most refined exposure and effects assumptions and LOEs supporting the conclusion of unacceptable risk.

5.6.1 Desert Shrew Baseline Risk Characterization Using Depth-Weighted EPCs

Desert shrew is an invertivorous small mammal that could potentially be exposed to COPECs in surface soil (0 to 0.5 foot bgs) directly and through its diet. Risk estimates for desert shrew for the baseline scenario using depth-weighted EPCs, a site use factor (SUF) of 1, and the TRVs used for RBRG development are summarized in this section and presented in Table AOC9-5.4.

Site-specific SUFs were not evaluated for desert shrew. Based on the AOC 9 potential exposure area and home ranges for desert shrew, the site-specific SUF was estimated as 1 (i.e., home range is less than or equal to the size of the potential exposure area). Therefore, the risk results would be the same as when calculated using a generic SUF of 1.

Detailed dose and risk calculations for desert shrew are presented in Attachment AOC9-C. COPECs evaluated in this scenario include total chromium, copper, and dioxin TEQ in soil. Hexavalent chromium was also evaluated to determine potential risks associated with post-NTCRA conditions.

LOAEL-based HQs for desert shrew are greater than 1 only for dioxin TEQ; potential risk for constituents evaluated in this ERA are is characterized as follows.

- For dioxin TEQ, The NOAEL- and LOAEL-based HQs are greater than 1. As described in Section 6.7.4 of the main report, uptake factors selected for dioxins at this site likely overestimate exposure and risk for this COPEC. Conservative assumptions were used to estimate the HQs, including use of BAFs based on uptake of a single congener (2,3,7,8-TCDD) to earthworms, and a diet assumed to consist entirely of earthworms which is unlikely given the desert habitat present at the site. As discussed in Section 6.5 of the main report, the alternate LOAEL-based TRV is based on the geometric mean of reproduction and growth LOAELs for rodents and is considered a robust estimate of toxicity to small mammals. Dioxin TEQ was detected at all nine locations in surface soil (frequency of detection was 100% from 0 to 0.5 foot bgs), with eight of the surface soil locations having depth-weighted concentrations above background (background threshold value was 5.58 nanograms per kilogram [ng/kg]) and four locations having concentrations exceeding 10 times the background concentration. The depth-weighted EPC of 102.6 ng/kg is primarily due to elevated concentrations in three locations that are spread across the AOC 9 potential exposure area (AOC9-21, AOC10a-3, and AOC9-16 with concentrations of 110, 120, and 190 ng/kg, respectively). Dioxin TEQ concentrations at these three sample locations are equal to or below the RBRG range of 190 to 360 ng/kg. Dioxin TEQ concentrations in the remaining surface soil samples range from 1.8 to 59 ng/kg. Based on the dispersed nature of remaining dioxin TEQ concentrations and the small home range of desert shrew, it is likely that desert shrew would primarily be exposed to lower soil concentrations in their habitat and few individuals could be substantially exposed to elevated concentrations. Although the LOAEL-based HQ exceeds 1,

additional LOEs include low HQs, conservative dietary and uptake assumptions, and the spatially dispersed nature of the highest remaining dioxin TEQ concentrations. Based on the LOAEL-based HQ and additional LOEs, unacceptable risk populations of desert shrew is considered unlikely based on the assumptions in this scenario.

- For hexavalent chromium, total chromium, and copper at the AOC 9 potential exposure area, the NOAEL- and LOAEL-based HQs are less than 1, indicating de minimis risk to individuals and populations of invertivorous small mammals.

Based on the risk estimates and potential uncertainties associated with the baseline risk to invertivorous small mammals from exposure to dioxin TEQ, area-weighted EPCs were also evaluated as discussed in Section 5.6.2.

5.6.2 Desert Shrew Baseline Risk Characterization Using Area-Weighted EPCs

Based on the risk characterization using depth-weighted EPCs (Section 5.6.1), risks to the desert shrew were characterized for dioxin TEQ using area-weighted EPCs. Risk estimates for hexavalent chromium, total chromium, and copper were also presented using area-weighted EPCs.

Potential risks to desert shrew from COPECs listed in this section and characterized for the baseline scenario using area-weighted EPCs, a SUF of 1, selected BAFs, and TRVs used for RBRG development are presented in Table AOC9-5.5. Detailed dose and risk calculations for desert shrew are presented in Attachment AOC9-C.

In the baseline scenario using area-weighted EPCs, the LOAEL-based HQ for desert shrew is greater than 1 only for dioxin TEQ.

- For dioxin TEQ, the NOAEL-based HQ using the area-weighted EPC is the same as the NOAEL-based HQ using the depth-weighted EPC. The LOAEL-based HQ using the area-weighted EPC is greater than the LOAEL-based HQ using the depth-weighted EPC. However, the uncertainties and additional LOEs, as discussed above in Section 5.6.1, also apply in this scenario and support the conclusion that unacceptable risk to populations of shrew is unlikely.

- Similar to the evaluation using depth-weighted EPCs, for hexavalent chromium, total chromium, and copper, the NOAEL- and LOAEL-based HQs using area-weighted EPCs are also less than 1, indicating de minimis risk to individuals and populations of invertivorous small mammals from exposure to these constituents at the AOC 9 potential exposure area.

Based on the risk estimates and potential uncertainties associated with the baseline scenario risk from dioxin TEQ, congener-specific BAFs were evaluated for dioxin TEQ, as discussed in Section 5.6.3.

5.6.3 Desert Shrew Baseline Risk Characterization Using Congener-Specific Bioaccumulation Factors for Dioxin TEQ

Based on the risk characterization using area-weighted EPCs (Section 5.6.2), risks were characterized for dioxin TEQ using alternate BAFs (i.e., BAFs used for RBRG development in the 2019 HHERA[Arcadis 2019]). Consistent with the 2019 HHERA, depth-weighted EPCs were used in this evaluation. Risks from total

chromium, hexavalent chromium, and copper are de minimis (Section 5.6.2), and risk estimates for these constituents were not refined further in this section.

As discussed in Section 6.4.3.2 of the main report and summarized above in Section 5.3, the BAFs used for RBRG development in the 2019 HHERA (Arcadis 2019) are based on congener-specific uptake from soil to biota, rather than on the assumption that all dioxin congener uptake is equivalent to the soil-to-biota uptake of 2,3,7,8-TCDD. Two sets of congener-specific uptake factors were evaluated: congener-specific uptake factors available from USEPA (1999) as well as congener-specific uptake factors from Fagervold et al. (2010). These are described in Section 6.4.3.2 of the main report. The congener-specific uptake factors and estimated biota tissue EPCs for dioxin TEQ in AOC 9 in this post-NTCRA ERA are presented in Table AOC9-5.3.

Potential risks to desert shrew for dioxin TEQ characterized for the baseline scenario using depth-weighted EPCs, a SUF of 1, congener-specific BAFs, and the alternate TRVs are presented in Table AOC9-5.6. Using the congener-specific BAFs from USEPA (1999) and Fagervold et al. (2010), the LOAEL-based HQs are less than 1, indicating that no unacceptable risk is expected for desert shrew populations.

Detailed dose and risk calculations for desert shrew are presented in Attachment AOC9-C.

5.6.4 Risk Conclusions for Desert Shrew

The 2019 HHERA (Arcadis 2019) concluded that potential risk to ecological receptors, including special-status species, in AOC 9 and the larger potential exposure areas relevant to large home-range receptors was limited to desert shrew potentially exposed to total chromium, copper, and dioxin TEQ in surface soil. This Post-NTCRA HHERA presents risk estimates for desert shrew and total chromium, copper, and dioxin TEQ in surface soil that reflect current conditions in the AOC 9 potential exposure area following soil remediation associated with the NTCRA. Risk estimates for hexavalent chromium (which was identified as potential risk driver at other investigation areas at the site in the 2019 HHERA) in the baseline scenario are also included to evaluate post-NTCRA conditions. Risk conclusions for desert shrew populations are presented in the following list.

- For dioxin TEQ, risk conclusions are based on LOAEL-based HQs estimated in the most refined exposure scenario (Section 5.6.3) using the assumptions used for RBRG development (i.e., a SUF of 1, congener-specific BAFs, and alternate TRVs) and depth-weighted EPCs. Using these assumptions, LOAEL-based HQs are less than 1 using both sets of congener-specific BAFs (USEPA 1999; Fagervold et al. 2010). These HQs indicate that no unacceptable risk is expected for populations of invertivorous small mammals.
- For hexavalent chromium, total chromium, and copper, the NOAEL- and LOAEL-based HQs are less than 1 for the baseline scenario, indicating de minimis risk to individuals and populations of invertivorous small mammals at the AOC 9 potential exposure area.

In conclusion, no unacceptable risk to wildlife receptor populations is identified at the AOC 9 potential exposure area. For desert shrew, the conclusions are based on post-NTCRA conditions as evaluated in this Post- NTCRA HHERA and summarized previously. For the remaining ecological receptors, the conclusions are based on pre-NTCRA conditions as evaluated in the 2019 HHERA (Arcadis 2019).

6 SUMMARY AND CONCLUSIONS FOR THE HHERA

Potential cumulative cancer risks and noncancer hazards for potential human receptors were estimated in this Post-NTCRA HHERA, as presented in Section 4. For ecological receptors, potential risks were estimated for desert shrew as presented in Section 5. Uncertainties related to the HHRA and ERA at the site in general are discussed in detail in Sections 5.6 and 6.7 of the 2019 HHERA (Arcadis 2019) and area summarized in Sections 5.5 and 6.7 of the main report. Uncertainties specific to the evaluation of post-NTCRA conditions in the AOC 9 potential exposure area are discussed in this appendix. The approach for this Post-NTCRA HHERA was detailed in the January 30, 2024 Technical Memo (Arcadis 2024) to DOI and DTSC, which specified that updated risk characterization would be presented only for risk-driving receptors.

One potential exposure scenario (baseline, i.e., no scouring) was evaluated, consistent with the scenario evaluated in the 2019 HHERA (Arcadis 2019). Risks were estimated for various potential receptors using depth-weighted EPCs and area-weighted EPCs. For desert shrew, additional refinements to the soil-to-invertebrate uptake factors were also evaluated in a manner consistent with the approach used for risk-based remedial goal (RBRG) development (i.e., the basis for the Soil NTCRA RAGs) in the 2019 HHERA (Arcadis 2019).

At the AOC 9 potential exposure area, the COPCs evaluated for this Post-NTCRA HHERA included 10 metals (antimony, arsenic, hexavalent chromium, total chromium, copper, lead, mercury, nickel, thallium, and zinc), one VOC (isophorone), PAHs, one pesticide (4,4-DDE), PCBs, TPH as diesel, TPH as motor oil, and dioxins/furans. COPECs evaluated for this Post-NTCRA HHERA include only total chromium, copper, and dioxin TEQ based on unacceptable risk estimated for desert shrew in the 2019 HHERA (Arcadis 2019). However, risk estimates for hexavalent chromium were also estimated to reflect current conditions in AOC 9 following soil remediation associated with the NTCRA. A summary of these results and conclusions regarding potential risk associated with exposure to these COPCs/COPECs in soil at the AOC 9 potential exposure area based on the risk/hazard estimates and uncertainties inherent in the risk assessment process are presented in this section.

6.1 Summary and Conclusions for the HHRA

The cumulative ILCRs and HIs associated with potential exposure to COPCs in post-NTCRA soil at the AOC 9 potential exposure area using depth- and area-weighted EPCs under the baseline scenario were estimated. Assuming lifetime soil contact is limited to the AOC 9 potential exposure area for the potential receptors evaluated, the estimated potential ILCR and HI results are summarized in this section and in Exhibit AOC 9-6.1.

Exhibit AOC 9-6.1 Baseline Scenario Estimated Cumulative Incremental Lifetime Cancer Risk and Hazard Index for the AOC 9 Potential Exposure Area

Potential Receptor	Exposure Depth	Cumulative ILCR—Depth-Weighted	Cumulative ILCR—Area-Weighted	HI—Depth-Weighted	HI—Area-Weighted
Camper	Surface	**3×10^{-6}** (arsenic, hexavalent chromium, B(a)PEQ, and dioxin TEQ)	**2×10^{-6}** (arsenic, hexavalent chromium,	Less than or equal to 1	Less than or equal to 1

Potential Receptor	Exposure Depth	Cumulative ILCR—Depth-Weighted	Cumulative ILCR—Area-Weighted	HI—Depth-Weighted	HI—Area-Weighted
			B(a)PEQ, and dioxin TEQ)		
Camper	Shallow	**3 x 10^{-6}** (arsenic, hexavalent chromium, B(a)PEQ, and dioxin TEQ)	**2 x 10^{-6}** (arsenic, hexavalent chromium, B(a)PEQ, and dioxin TEQ)	Less than or equal to 1	Less than or equal to 1
Hiker	Surface	**6 x 10^{-6}** (arsenic, hexavalent chromium, B(a)PEQ, and dioxin TEQ)	**5 x 10^{-6}** (arsenic, hexavalent chromium, B(a)PEQ, and dioxin TEQ)	Less than or equal to 1	Less than or equal to 1
Hiker	Shallow	**5 x 10^{-6}** (arsenic, hexavalent chromium, B(a)PEQ, and dioxin TEQ)	**4 x 10^{-6}** (arsenic, hexavalent chromium, B(a)PEQ, and dioxin TEQ)	Less than or equal to 1	Less than or equal to 1
OHV Rider	Surface	**4 x 10^{-6}** (arsenic, hexavalent chromium, B(a)PEQ, and dioxin TEQ)	**3 x 10^{-6}** (arsenic, hexavalent chromium, B(a)PEQ, and dioxin TEQ)	Less than or equal to 1	Less than or equal to 1
OHV Rider	Shallow	**3 x 10^{-6}** (arsenic, hexavalent chromium, B(a)PEQ, and dioxin TEQ)	**3 x 10^{-6}** (arsenic, hexavalent chromium, B(a)PEQ, and dioxin TEQ)	Less than or equal to 1	Less than or equal to 1

Note:
not calculated = area-weighted estimate not calculated because depth-weighted estimates for the receptor was below de minimis levels

Depth-Weighted Potential Exposures

Potential exposures that are at or below de minimis levels include the following:

- **HI less than or equal to 1 for all soil depths**—camper, hiker, and OHV rider; and
- **ILCR less than or equal to 1 x 10^{-6}** —none.

Potential exposures that are above de minimis levels of HI greater than 1 and/or within the risk management range of 1×10^{-6} and 1×10^{-4} include the following:

- **ILCR greater than 1 x 10^{-6} and less than or equal to 5 x 10^{-6}**—camper (surface and shallow), hiker (shallow), and OHV rider (surface and shallow);

- **ILCR greater than 5 x 10^{-6} and less than or equal to 1 x 10^{-5}**—hiker (surface); and
- **ILCR greater than 1 x 10^{-5} and less than or equal to 1 x 10^{-4}**—none.

Assuming lifetime soil contact is limited to the AOC 9 potential exposure area, the depth-weighted estimated risks and hazards above de minimis levels for the camper, hiker, and OHV rider were due to arsenic, hexavalent chromium, B(a)PEQ, and dioxin TEQ. Therefore, potential risks and hazards for these three potential receptors were estimated using area-weighted EPCs and are provided in this section.

Area-Weighted Potential Exposures

Potential exposures that are at or below de minimis levels include the following:

- **HI less than or equal to 1 for all soil depths**—camper, hiker, and OHV rider; and
- **ILCR less than or equal to 1 x 10^{-6} for all soil depths**—none.

Potential exposures that are above de minimis levels of HI greater than 1 and/or within the risk management range of 1×10^{-6} and 1×10^{-4} include the following:

- **ILCR greater than 1 x 10^{-6} and less than or equal to 5 x 10^{-6}**—camper (surface and shallow), hiker (surface and shallow), and OHV rider (surface and shallow);
- **ILCR greater than 5 x 10^{-6} and less than or equal to 1 x 10^{-5}**—none; and
- **ILCR greater than 1 x 10^{-5} and less than or equal to 1 x 10^{-4}**—none.

OVERALL SUMMARY

Assuming lifetime soil contact is limited to the AOC 9 potential exposure area, the estimated cumulative ILCRs associated with potential exposure to COPCs in post-NTCRA soil using depth-weighted EPCs for the camper, hiker, and OHV rider are above 1×10^{-6}. Therefore, the camper, hiker, and OHV rider receptors were carried forward in the area-weighted evaluation. The estimated cumulative ILCRs using the depth- and area-weighted EPCs for the camper, hiker, and OHV rider were above the point of departure for risk management decisions of 1×10^{-6} but well within the risk management range of 1×10^{-6} and 1×10^{-4}. The depth- and area-weighted estimated cumulative ILCRs are also below the Fish and Wildlife's cancer risk threshold level of 1 x 10^{-5} for soil deeper than 2 feet below ground surface (February 12, 2021 Topock Soil EE/CA Response to Comment Consultation Meeting Agenda).

In general, the area-weighted approach resulted in a reduction in the risk or hazard estimates, which ranged from 1.2 to 1.3 times lower than the depth-weighted estimates. However, use of the area-weighted approach does not change the overall conclusions of the HHRA for the AOC 9 potential exposure area evaluation. Approximately 78 to 85% of the estimated ILCRs for arsenic are attributed to background concentrations of arsenic in soil. Considering the substantial contribution of background arsenic in soil to the estimated cumulative ILCRs for all the receptors potentially exposed to AOC 9 potential exposure area soil, it is likely that incremental risks for site-related COPCs in soil are at or only slightly above 1×10^{-6}, but below 5 x 10^{-6}, which is well within the risk management range of 1×10^{-6} and 1×10^{-4}.

The cumulative HIs estimated using the depth-weighted and area-weighted EPCs for the camper, hiker, and OHV rider were below 1. The depth- and area-weighted EPCs for lead in the AOC 9 potential exposure area

soil at all exposure depths are not expected to result in an increase in blood lead levels above OEHHA benchmark value of 1 µg/dL in the child recreational user.

Risks/hazards estimated for an individual AOC/SWMU/UA potential exposure area like AOC 9 are not considered representative of the realistic or likely potential exposures for the human populations that could be present in the areas outside the TCS (such as recreational users). Risks/hazards calculated separately for individual AOCs are conservative and likely overestimate health. As stated previously, the Post-NTCRA HHERA provides updated risk estimates for human health and the environment based on potential exposures to current soil conditions in the NTCRA areas. Therefore, updated risk estimates were not performed for the OCS potential exposure area in the Post-NTCRA HHERA It is noted that due to NTCRA soil removal, the potential post-NTCRA soil risks for the OCS are likely lower than estimated in the 2019 HHERA. The HHRA results and conclusions of the 2019 HHERA and of this Post-NTCRA HHERA will be considered for making risk-management decisions for the site in the Corrective Measure Study/Feasibility Study to be prepared for the site.

6.2 Summary and Conclusions for the ERA

At the AOC 9 potential exposure area, total chromium, copper, and dioxin TEQ were identified as potential risk-driving COPECs based on unacceptable risk estimated for the desert shrew in the 2019 HHERA (Arcadis 2019). Risk estimates for hexavalent chromium (which was identified as a potential risk driver at other investigation areas at the site in the 2019 HHERA) are also included to evaluate post-NTCRA conditions. One scenario (baseline) was evaluated for AOC 9 in this post-NTCRA ERA, consistent with the scenario evaluated in the 2019 HHERA. Updated risk estimates for the potential risk-driving COPECs are presented only for desert shrew. The 2019 HHERA did not identify a potential for unacceptable risk to sensitive species, and therefore protection of individual invertivorous small mammals is not warranted. This Post-NTCRA HHERA presents NOAEL-based HQs for completeness; however, only the LOAEL-based HQs were used to evaluate population-level protection of invertivorous small mammals.

Risks were evaluated using depth-weighted and area-weighted EPCs as well as refined BAFs based on congener-specific soil-to-biota uptake for dioxin TEQ. HQs are summarized in Table AOC9-6.1. Risk conclusions for desert shrew populations were based on the following criteria:

- COPECs with NOAEL-based HQs less than or equal to 1 pose de minimis risk to wildlife receptors.
- COPECs with NOAEL-based HQs greater than 1 but LOAEL-based HQs less than or equal to 1 pose no unacceptable risks to wildlife populations; however, the potential for unacceptable risk to individuals is uncertain based on the HQ. Because protection at the individual level is not warranted for desert shrew, COPECs with NOAEL-based HQs greater than 1 and LOAEL-based HQs less than 1 were not further evaluated using a WOE approach.
- COPECs with LOAEL-based HQs greater than 1 pose possible unacceptable risk to populations of wildlife receptors based on the HQ LOEs. In such cases, a WOE approach was used in reducing uncertainty for characterizing potential risk to wildlife populations at the AOC 9 potential exposure area.

The risk estimates (HQs) represent a single LOE for risk characterization. A qualitative WOE approach, incorporating other LOEs and uncertainties, was used to characterize potential risk to wildlife populations at AOC 9. Alternate congener-specific BAFs and alternate TRVs demonstrating the magnitude of the risk

overestimation are evaluated together in Section 5.6.3. These alternate BAFs and TRVs are based on the current understanding of uptake and toxicity of TEQ mixtures and represent key LOEs considered for dioxin TEQ.

For COPECs with LOAEL HQs greater than 1 using the most refined exposure and effects assumptions, a WOE assessment was used to draw risk conclusions for the AOC 9 potential exposure area.

Overall, no unacceptable risk to populations of invertivorous small mammals (e.g., desert shrew) exposed to risk-driving COPECs in soil is expected. Conclusions for COPECs (i.e., total chromium, copper, and dioxin TEQ), as well as other NTCRA-related constituents (i.e., hexavalent chromium) for the baseline scenario evaluations for the AOC 9 potential exposure area are presented in Section 5.6.4 and summarized below in the following list and Exhibit AOC 9-6.2.

- For dioxin TEQ, LOAEL-based HQs are less than 1 using both sets of congener-specific BAFs, indicating no unacceptable risk to populations of invertivorous small mammals.
- For hexavalent chromium, total chromium, and copper, the NOAEL- and LOAEL-based HQs are less than 1 for the baseline scenario, indicating de minimis risk to individuals and populations of invertivorous small mammals at the AOC 9 potential exposure area.

In conclusion, no unacceptable risk to wildlife receptor populations is identified at the AOC 9 potential exposure area. For desert shrew, the conclusions are based on post-NTCRA conditions as evaluated in this Post-NTCRA HHERA. For the remaining ecological receptors, the conclusions are based on pre-NTCRA conditions as evaluated in the 2019 HHERA (Arcadis 2019).

Exhibit AOC 9-6.2 Potential for Unacceptable Risk to Desert Shrew at the AOC 9 Potential Exposure Area

Scenario	Dioxin TEQ	Total Chromium	Hexavalent Chromium	Copper
Baseline	None for wildlife populations	None for wildlife populations	None for wildlife populations	None for wildlife populations

7 REFERENCES

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TABLES

Table AOC9-1.1
Samples and Sampling Locations Included in the AOC 9 Potential Exposure Area

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

SampleID	Sample Date	Location ID	RFI Area	Original Upper Depth (ft bgs)	Original Lower Depth (ft bgs)	Used for EPCs (2019 H H E R A)?[a]	Original Baseline (ft bgs)	Excavation Status	Excavation Depth (ft)	Backfill Depth (ft)	Current Upper Depth (ft bgs)	Current Lower Depth (ft bgs)	Current Baseline (ft bgs)	Sample Source (2019 H H E R A, N T C R A, or R F I Addition)	Used for Post-N T C R A H H E R A EPCs?[b]
#10	4/6/2000	#10	AOC9	0	3	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
#12	4/6/2000	#12	AOC9	0	3	Yes	0-0.5	In Place	0	0	0	3	0-005, 0-03 ft	2019 HHERA	Yes
#4	4/6/2000	#4	AOC9	0	3	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
#5	4/6/2000	#5	AOC9	0	3	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
#6	4/6/2000	#6	AOC9	0	3	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
#7	4/6/2000	#7	AOC9	0	3	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
#8	4/6/2000	#8	AOC9	0	3	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
#9	4/6/2000	#9	AOC9	0	3	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
300a-34-1043	4/6/2011	AOC10-OS2	AOC10	5.5	6	Yes	0-06	In Place	0	0	5.5	6	NE	2019 HHERA	No, Depth NA
AOC10-18-5227	12/6/2015	AOC10-18	AOC10	0	1	Yes	0-0.5	In Place	0	0	0	1	0-005, 0-03 ft	2019 HHERA	Yes
AOC10-18-5228	12/6/2015	AOC10-18	AOC10	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 HHERA	Yes
AOC10-20-5247	2/17/2016	AOC10-20	AOC10	0	0.5	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
AOC10-20-5248	2/25/2016	AOC10-20	AOC10	2	3	Yes	0-03	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
AOC10-21-5251	2/25/2016	AOC10-21	AOC10	0	0.5	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
AOC10-21-5252	2/25/2016	AOC10-21	AOC10	2	3	Yes	0-03	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
AOC10-22-5254	2/17/2016	AOC10-22	AOC10	0	0.5	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
AOC10-22-5255	2/17/2016	AOC10-22	AOC10	1	2	Yes	0-03	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
AOC10-22-5256	2/17/2016	AOC10-22	AOC10	2	3	Yes	0-03	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
AOC10-22-5257	2/17/2016	AOC10-22	AOC10	5	6	Yes	0-06	In Place	3	3	5	6	NE	2019 HHERA	No, Depth NA
AOC10-23-5258	2/25/2016	AOC10-23	AOC10	0	1	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
AOC10-23-5259	2/25/2016	AOC10-23	AOC10	2	3	Yes	0-03	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
AOC10-23-5260	2/25/2016	AOC10-23	AOC10	1	2	Yes	0-03	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
AOC10a-1-5036	10/17/2008	AOC10a-1	AOC10	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 HHERA	Yes
AOC10a-2-5233	1/13/2016	AOC10a-2	AOC10	0	1	Yes	0-0.5	In Place	0	0	0	1	0-005, 0-03 ft	2019 HHERA	Yes
AOC10a-2-5234	1/13/2016	AOC10a-2	AOC10	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 HHERA	Yes
AOC10a-2-5235	1/13/2016	AOC10a-2	AOC10	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 HHERA	No, Depth NA
AOC10a-2-5236	1/13/2016	AOC10a-2	AOC10	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 HHERA	No, Depth NA
AOC10a-3-5237	1/13/2016	AOC10a-3	AOC10	0	1	Yes	0-0.5	In Place	0	0	0	1	0-005, 0-03 ft	2019 HHERA	Yes
AOC10a-3-5238	1/13/2016	AOC10a-3	AOC10	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 HHERA	Yes
AOC10a-3-5239	1/13/2016	AOC10a-3	AOC10	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 HHERA	No, Depth NA
AOC10a-3-5240	1/13/2016	AOC10a-3	AOC10	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 HHERA	No, Depth NA
AOC10a-4-5278	1/8/2017	AOC10a-4	AOC10	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 HHERA	Yes
AOC10a-4-5279	1/8/2017	AOC10a-4	AOC10	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 HHERA	Yes
AOC10a-4-5280	1/8/2017	AOC10a-4	AOC10	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 HHERA	No, Depth NA
AOC10a-4-5281	1/8/2017	AOC10a-4	AOC10	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 HHERA	No, Depth NA
AOC10TAA1-CF10-3	9/7/2023	AOC10TAA1-CF10	AOC10	3	3.5	No	--	In Place	3	3	3	3.5	NE	NTCRA	No, Depth NA
AOC10TAA1-CF11-4	9/8/2023	AOC10TAA1-CF11	AOC10	4	4.5	No	--	In Place	4	4	4	4.5	NE	NTCRA	No, Depth NA
AOC10TAA1-CF12-5	9/13/2023	AOC10TAA1-CF12	AOC10	5	5.5	No	--	In Place	5	5	5	5.5	NE	NTCRA	No, Depth NA
AOC10TAA1-CF1-3	7/24/2023	AOC10TAA1-CF1	AOC10	3	3.5	No	--	In Place	3	3	3	3.5	NE	NTCRA	No, Depth NA
AOC10TAA1-CF13-5	9/15/2023	AOC10TAA1-CF13	AOC10	5	5.5	No	--	In Place	5	5	5	5.5	NE	NTCRA	No, Depth NA
AOC10TAA1-CF14-5	9/15/2023	AOC10TAA1-CF14	AOC10	5	5.5	No	--	In Place	5	5	5	5.5	NE	NTCRA	No, Depth NA
AOC10TAA1-CF2a-3	7/24/2023	AOC10TAA1-CF2a	AOC10	3	3.5	No	--	In Place	3	3	3	3.5	NE	NTCRA	No, Depth NA
AOC10TAA1-CF3-3	8/4/2023	AOC10TAA1-CF3	AOC10	3	3.5	No	--	In Place	3	3	3	3.5	NE	NTCRA	No, Depth NA
AOC10TAA1-CF4-3	8/4/2023	AOC10TAA1-CF4	AOC10	3	3.5	No	--	In Place	3	3	3	3.5	NE	NTCRA	No, Depth NA
AOC10TAA1-CF5-3	8/4/2023	AOC10TAA1-CF5	AOC10	3	3.5	No	--	In Place	3	3	3	3.5	NE	NTCRA	No, Depth NA
AOC10TAA1-CF6-3	8/18/2023	AOC10TAA1-CF6	AOC10	3	3.5	No	--	In Place	3	3	3	3.5	NE	NTCRA	No, Depth NA
AOC10TAA1-CF6-3FD	8/18/2023	AOC10TAA1-CF6	AOC10	3	3.5	No	--	In Place	3	3	3	3.5	NE	NTCRA	No, Depth NA
AOC10TAA1-CF7-3	8/18/2023	AOC10TAA1-CF7	AOC10	3	3.5	No	--	In Place	3	3	3	3.5	NE	NTCRA	No, Depth NA
AOC10TAA1-CF8-3	8/22/2023	AOC10TAA1-CF8	AOC10	3	3.5	No	--	In Place	3	3	3	3.5	NE	NTCRA	No, Depth NA
AOC10TAA1-CF9-3	8/30/2023	AOC10TAA1-CF9	AOC10	3	3.5	No	--	In Place	3	3	3	3.5	NE	NTCRA	No, Depth NA
AOC10TAA1-CW10-1	8/31/2023	AOC10TAA1-CW10	AOC10	1	1.5	No	--	In Place	1	1	1	1.5	0-03 ft	NTCRA	Yes
AOC10TAA1-CW11-2.5	9/7/2023	AOC10TAA1-CW11	AOC10	2.5	3	No	--	In Place	2.5	2.5	2.5	3	0-03 ft	NTCRA	Yes
AOC10TAA1-CW1-2	7/20/2023	AOC10TAA1-CW1	AOC10	2	2.5	No	--	In Place	2	2	2	2.5	0-03 ft	NTCRA	Yes
AOC10TAA1-CW12-3	9/8/2023	AOC10TAA1-CW12	AOC10	3	3.5	No	--	In Place	3	3	3	3.5	NE	NTCRA	No, Depth NA
AOC10TAA1-CW14-2.5	9/11/2023	AOC10TAA1-CW14	AOC10	2.5	3	No	--	In Place	2.5	2.5	2.5	3	0-03 ft	NTCRA	Yes
AOC10TAA1-CW15-3	9/13/2023	AOC10TAA1-CW15	AOC10	3	3.5	No	--	In Place	3	3	3	3.5	NE	NTCRA	No, Depth NA
AOC10TAA1-CW16-3	9/15/2023	AOC10TAA1-CW16	AOC10	3	3.5	No	--	In Place	3	3	3	3.5	NE	NTCRA	No, Depth NA
AOC10TAA1-CW17-3	9/15/2023	AOC10TAA1-CW17	AOC10	3	3.5	No	--	In Place	3	3	3	3.5	NE	NTCRA	No, Depth NA

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PG&E Topock Compressor Station
Needles, California

SampleID	Sample Date	Location ID	RFI Area	Original Upper Depth (ft bgs)	Original Lower Depth (ft bgs)	Used for EPCs (2019 H H E R A)?[a]	Original Baseline (ft bgs)	Excavation Status	Excavation Depth (ft)	Backfill Depth (ft)	Current Upper Depth (ft bgs)	Current Lower Depth (ft bgs)	Current Baseline (ft bgs)	Sample Source (2019 H H E R A, N T C R A, or R F I Addition)	Used for Post-N T C R A H H E R A EPCs?[b]
AOC10TAA1-CW18-3	9/15/2023	AOC10TAA1-CW18	AOC10	3	3.5	No	--	In Place	3	3	3	3.5	NE	NTCRA	No, Depth NA
AOC10TAA1-CW19-3	10/13/2023	AOC10TAA1-CW19	AOC10	3	3.5	No	--	In Place	3	3	3	3.5	NE	NTCRA	No, Depth NA
AOC10TAA1-CW2-2	7/20/2023	AOC10TAA1-CW2	AOC10	2	2.5	No	--	In Place	2	2	2	2.5	0-03 ft	NTCRA	Yes
AOC10TAA1-CW4-2	7/28/2023	AOC10TAA1-CW4	AOC10	2	2.5	No	--	In Place	2	2	2	2.5	0-03 ft	NTCRA	Yes
AOC10TAA1-CW9-1.5	8/22/2023	AOC10TAA1-CW9	AOC10	1.5	2	No	--	In Place	1.5	1.5	1.5	2	0-03 ft	NTCRA	Yes
AOC9-10-4023	10/1/2008	AOC9-10	AOC9	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 HHERA	Yes
AOC9-10-4024	10/1/2008	AOC9-10	AOC9	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 HHERA	Yes
AOC9-11-4025	9/18/2008	AOC9-11	AOC9	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 HHERA	Yes
AOC9-11-4026	9/18/2008	AOC9-11	AOC9	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 HHERA	Yes
AOC9-12-4027	10/1/2008	AOC9-12	AOC9	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 HHERA	Yes
AOC9-12-4028	10/1/2008	AOC9-12	AOC9	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 HHERA	Yes
AOC9-13-4029	9/19/2008	AOC9-13	AOC9	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 HHERA	Yes
AOC9-13-4030	9/19/2008	AOC9-13	AOC9	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 HHERA	Yes
AOC9-1-4001	10/1/2008	AOC9-1	AOC9	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 HHERA	Yes
AOC9-1-4002	10/1/2008	AOC9-1	AOC9	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 HHERA	Yes
AOC9-14-4032	10/2/2008	AOC9-14	AOC9	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 HHERA	Yes
AOC9-14-4033	10/2/2008	AOC9-14	AOC9	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 HHERA	Yes
AOC9-15-4100	12/6/2015	AOC9-15	AOC9	0	1	Yes	0-0.5	In Place	0	0	0	1	0-005, 0-03 ft	2019 HHERA	Yes
AOC9-15-4101	12/6/2015	AOC9-15	AOC9	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 HHERA	Yes
AOC9-16-4105	1/13/2016	AOC9-16	AOC9	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 HHERA	Yes
AOC9-16-4106	1/13/2016	AOC9-16	AOC9	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 HHERA	Yes
AOC9-16-4107	1/13/2016	AOC9-16	AOC9	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 HHERA	No, Depth NA
AOC9-16-4108	1/13/2016	AOC9-16	AOC9	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 HHERA	No, Depth NA
AOC9-17-4109	1/10/2016	AOC9-17	AOC9	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 HHERA	No, Depth NA
AOC9-18-4111	1/10/2016	AOC9-18	AOC9	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 HHERA	No, Depth NA
AOC9-18-4112	1/10/2016	AOC9-18	AOC9	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 HHERA	No, Depth NA
AOC9-19-4114	1/13/2016	AOC9-19	AOC9	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 HHERA	Yes
AOC9-19-4115	1/13/2016	AOC9-19	AOC9	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 HHERA	Yes
AOC9-19-4116	1/13/2016	AOC9-19	AOC9	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 HHERA	No, Depth NA
AOC9-19-4117	1/13/2016	AOC9-19	AOC9	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 HHERA	No, Depth NA
AOC9-20-4118	1/13/2016	AOC9-20	AOC9	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 HHERA	Yes
AOC9-20-4119	1/13/2016	AOC9-20	AOC9	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 HHERA	Yes
AOC9-20-4121	1/13/2016	AOC9-20	AOC9	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 HHERA	No, Depth NA
AOC9-21-4123	1/8/2017	AOC9-21	AOC9	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 HHERA	Yes
AOC9-21-4124	1/8/2017	AOC9-21	AOC9	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 HHERA	Yes
AOC9-21-4125	1/8/2017	AOC9-21	AOC9	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 HHERA	Yes
AOC9-21-4126	1/8/2017	AOC9-21	AOC9	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 HHERA	No, Depth NA
AOC9-22-4127	1/4/2017	AOC9-22	AOC9	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 HHERA	Yes
AOC9-22-4128	1/4/2017	AOC9-22	AOC9	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 HHERA	Yes
AOC9-22-4129	1/4/2017	AOC9-22	AOC9	4.5	5	Yes	0-06	In Place	0	0	4.5	5	NE	2019 HHERA	No, Depth NA
AOC9-2-4003	9/18/2008	AOC9-2	AOC9	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 HHERA	Yes
AOC9-2-4004	9/18/2008	AOC9-2	AOC9	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 HHERA	Yes
AOC9-3-4005	9/18/2008	AOC9-3	AOC9	0	0.5	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
AOC9-3-4006	9/18/2008	AOC9-3	AOC9	2	3	Yes	0-03	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
AOC9-4-4007	9/18/2008	AOC9-4	AOC9	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 HHERA	Yes
AOC9-4-4008	9/18/2008	AOC9-4	AOC9	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 HHERA	Yes
AOC9-5-4009	10/1/2008	AOC9-5	AOC9	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 HHERA	Yes
AOC9-5-4010	10/1/2008	AOC9-5	AOC9	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 HHERA	Yes
AOC9-5-4011	10/1/2008	AOC9-5	AOC9	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 HHERA	Yes
AOC9-6-4012	9/18/2008	AOC9-6	AOC9	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 HHERA	Yes
AOC9-6-4013	9/18/2008	AOC9-6	AOC9	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 HHERA	Yes
AOC9-7-4014	9/18/2008	AOC9-7	AOC9	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 HHERA	Yes
AOC9-7-4015	9/18/2008	AOC9-7	AOC9	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 HHERA	Yes
AOC9-8-4016	10/1/2008	AOC9-8	AOC9	0	0.5	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
AOC9-8-4017	10/1/2008	AOC9-8	AOC9	2.5	3	Yes	0-03	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
AOC9-8-4018	10/1/2008	AOC9-8	AOC9	5.5	6	Yes	0-06	In Place	3	3	5.5	6	NE	2019 HHERA	No, Depth NA
AOC9-9-4019	10/1/2008	AOC9-9	AOC9	0	0.5	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
AOC9-9-4020	10/1/2008	AOC9-9	AOC9	2.5	3	Yes	0-03	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated

Table AOC9-1.1
Samples and Sampling Locations Included in the AOC 9 Potential Exposure Area

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Needles, California

SampleID	Sample Date	Location ID	RFI Area	Original Upper Depth (ft bgs)	Original Lower Depth (ft bgs)	Used for EPCs (2019 H H E R A)?[a]	Original Baseline (ft bgs)	Excavation Status	Excavation Depth (ft)	Backfill Depth (ft)	Current Upper Depth (ft bgs)	Current Lower Depth (ft bgs)	Current Baseline (ft bgs)	Sample Source (2019 H H E R A, N T C R A, or R F I Addition)	Used for Post-N T C R A H H E R A EPCs?[b]
AOC9-9-4021	10/1/2008	AOC9-9	AOC9	5.5	6	Yes	0-06	In Place	3	3	5.5	6	NE	2019 HHERA	No, Depth NA
AOC9TAA1-CF1-3	7/17/2023	AOC9TAA1-CF1	AOC9	3	3.5	No	--	In Place	3	3	3	3.5	NE	NTCRA	No, Depth NA
AOC9TAA1-CW1-2	7/17/2023	AOC9TAA1-CW1	AOC9	2	2.5	No	--	In Place	2	2	2	2.5	0-03 ft	NTCRA	Yes
AOC9TAA1-CW2a-1	9/8/2023	AOC9TAA1-CW2a	AOC9	1	1.5	No	--	In Place	1	1	1	1.5	0-03 ft	NTCRA	Yes
AOC9TAA1-CW3-2	7/17/2023	AOC9TAA1-CW3	AOC9	2	2.5	No	--	In Place	2	2	2	2.5	0-03 ft	NTCRA	Yes
AOC9TAA1-CW4a-1	9/8/2023	AOC9TAA1-CW4a	AOC9	1	1.5	No	--	In Place	1	1	1	1.5	0-03 ft	NTCRA	Yes
PA-05-1	11/9/2015	PA-05	Perimeter	0	1	Yes	0-0.5	In Place	0	0	0	1	0-005, 0-03 ft	2019 HHERA	Yes
PA-06-1	11/9/2015	PA-06	Perimeter	0	1	Yes	0-0.5	In Place	0	0	0	1	0-005, 0-03 ft	2019 HHERA	Yes
PA-18-01	1/27/2016	PA-18	Perimeter	0	1	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
PA-18-04	1/26/2017	PA-18	AOC10	5	6	No	--	In Place	3	3	5	6	NE	RFI Addition	No, Depth NA
PA-19-01	1/27/2016	PA-19	Perimeter	0	1	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
PA-19-03	1/31/2017	PA-19	AOC10	5	6	No	--	In Place	3	3	5	6	NE	RFI Addition	No, Depth NA
PA-20-01	1/27/2016	PA-20	Perimeter	0	1	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
PA-20-03	1/31/2017	PA-20	AOC10	5	6	No	--	In Place	3	3	5	6	NE	RFI Addition	No, Depth NA
PA-21-01	1/27/2016	PA-21	Perimeter	0	1	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
PA-21-03	1/31/2017	PA-21	AOC10	5	6	No	--	In Place	3	3	5	6	NE	RFI Addition	No, Depth NA
PA-23-01	1/27/2016	PA-23	Perimeter	0	1	Yes	0-0.5	In Place	0	0	0	1	0-005, 0-03 ft	2019 HHERA	Yes
PS-22-0	4/13/1999	PS-22	AOC10	0	0	Yes	0-0.5	In Place	0	0	0	0	0-005, 0-03 ft	2019 HHERA	Yes
SD-1-D1	1/13/2016	SD-01	StormDrains	0	0.5	Yes	0-0.5	In Place	0	0	0	0.5	0-005, 0-03 ft	2019 HHERA	Yes
SD-1-D2	1/13/2016	SD-01	StormDrains	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 HHERA	Yes
SD-1-D3	1/13/2016	SD-01	StormDrains	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 HHERA	No, Depth NA
SD-1-D4	1/13/2016	SD-01	StormDrains	9	10	Yes	0-10	In Place	0	0	9	10	NE	2019 HHERA	No, Depth NA
SD-2-01	11/10/2015	SD-02	StormDrains	0	1	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
SD-2-03	11/10/2015	SD-02	StormDrains	2	3	Yes	0-03	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
SD-21-01	3/10/2016	SD-21	StormDrains	0	1	Yes	0-0.5	In Place	0	0	0	1	0-005, 0-03 ft	2019 HHERA	Yes
SD-21-03	3/10/2016	SD-21	StormDrains	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 HHERA	Yes
SD-3-01	11/10/2015	SD-03	StormDrains	0	1	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
SD-3-03	11/10/2015	SD-03	StormDrains	2	3	Yes	0-03	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
SD-4-01	11/10/2015	SD-04	StormDrains	0	1	Yes	0-0.5	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
SD-4-03	11/10/2015	SD-04	StormDrains	2	3	Yes	0-03	Removed	--	0	NE	NE	NE	2019 HHERA	No, Excavated
SD-6-01	11/10/2015	SD-06	StormDrains	0	1	Yes	0-0.5	In Place	0	0	0	1	0-005, 0-03 ft	2019 HHERA	Yes
SD-6-03	11/10/2015	SD-06	StormDrains	2	3	Yes	0-03	In Place	0	0	2	3	0-03 ft	2019 HHERA	Yes
SD-6-05	11/10/2015	SD-06	StormDrains	5	6	Yes	0-06	In Place	0	0	5	6	NE	2019 HHERA	No, Depth NA

Notes:
[a] Samples evaluated in the 2019 HHERA for the 0 to 10 foot bgs interval for the baseline scenario are presented in this table.
[b] Sample locations represent data evaluated in the Post-N T C R A HHERA for the 0 to 3 foot bgs interval in the baseline scenario.

Abbreviations:
"--" = not applicable
< = less than
> = greater than
A O C = area of concern
bgs = below ground surface
ft = foot
H H E R A = human health and ecological risk assessment
Depth NA = depth not applicable to the dataset
N E = not evaluated (i.e., sample was excavated or depth interval not applicable to the dataset)
N T C R A = non time critical removal action
R F I = RCRA Facility Investigation

Table AOC9-2.1
Comparison of Soil Data for Non-Risk-Driving Constituents in the 2019 HHERA and NTCRA/RFI Additions for the Baseline (No Scouring) Scenario for AOC 9 (0 to 0.5 foot bgs and 0 to 3 feet bgs)

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Category	Constituent [a]	Units	Soil Depth Interval (ft bgs)	Detects	Total Samples	Frequency of Detection	Minimum Detect	Maximum Detect	Minimum Nondetect	Maximum Nondetect	Mean Detected	Kaplan Meier Mean	Median	Variance	Standard Deviation
HHERA	Lead	mg/kg	0-3	78	78	100	1.9	920	N/A	N/A	29.22	29.22	9.65	11315	106.4
HHERA	Mercury	mg/kg	0-3	18	78	23	0.11	35	0.099	0.12	2.287	0.604	0.145	67.17	8.196
HHERA	Molybdenum	mg/kg	0-3	10	76	13	1	19	1	5.4	5.95	1.657	3.6	34.23	5.851
HHERA	Zinc	mg/kg	0-3	85	85	100	10	1000	N/A	N/A	102	102	48	31876	178.5
NTCRA	Lead	mg/kg	0-3	11	11	100	2.4	13	N/A	N/A	5.964	5.964	4	16.31	4.038
NTCRA	Mercury	mg/kg	0-3	1	11	9	0.53	0.53	0.1	0.11	0.53	0.139	0.53	N/A	N/A
NTCRA	Molybdenum	mg/kg	0-3	1	11	9	0.51	0.51	1	1.1	0.51	0.51	0.51	N/A	N/A
NTCRA	Zinc	mg/kg	0-3	11	11	100	14	110	N/A	N/A	37.27	37.27	30	865	29.41

Notes:

[a] The HHERA dataset is consistent with the 2019 HHERA (Arcadis 2019). The NTCRA dataset consists of 1) data collected as part of the NTCRA and 2) data collected after the submittal of the 2019 HHERA to support the RFI.

Abbreviations:

"--" = not applicable
AOC = area of concern
COPC = constituent of potential concern
COPEC = constituent of potential ecological concern
FOD = frequency of detection, percent
ft bgs = feet below ground surface
KM = Kaplan-Meier
mg/kg = milligrams per kilogram
N/A = not applicable
ND = not detected
PG&E = Pacific Gas and Electric Company

References:

Arcadis. 2019. Final Soil Human Health and Ecological Risk Assessment Report, Topock Compressor Station, Needles, California.

Table AOC9-3.1
Summary Statistics for Depth-Weighted Soil Data and Exposure Point Concentrations for the Baseline (No Scouring) Scenario for AOC 9 (0 to 0.5 foot bgs and 0 to 3 feet bgs)

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

Category	Constituent [a]	Units	Soil Depth Interval (ft bgs)	Detects	Total	Frequency of Detection	Minimum Detect	Maximum Detect	Minimum Nondetect	Maximum Nondetect	Mean Detected	Kaplan Meier Mean	Median	Variance	Standard Deviation	C O P C/ C O P E C? [b]	EPC (Depth-Weighted UCL) [c,d]	EPC Basis (Depth-Weighted UCL)	EPC (Area-Weighted UCL) [c,d]	EPC Basis (Area-Weighted UCL)
Inorganics	Aluminum	mg/kg	0-0.5	6	6	100	4100	13000	NA	NA	8150	8150	8000	10267000	3204	--	--	--	--	--
Inorganics	Antimony	mg/kg	0-0.5	1	41	2	15	15	1	1.2	15	1.341	15	NA	NA	X	15	Max Detect	15	Max Detect
Inorganics	Arsenic	mg/kg	0-0.5	41	41	100	2.2	12	NA	NA	4.785	4.785	3.8	5.968	2.443	X	5.45	95% Modified-t UCL	4.45	Bootstrap BCA 95UCL
Inorganics	Barium	mg/kg	0-0.5	41	41	100	57	320	NA	NA	120.8	120.8	110	2401	49	--	--	--	--	--
Inorganics	Beryllium	mg/kg	0-0.5	0	41	0	NA	NA	0.5	2.7	NA	NA	NA	NA	NA	--	--	--	--	--
Inorganics	Cadmium	mg/kg	0-0.5	2	41	5	1.8	7.4	0.5	0.6	4.6	0.7	4.6	15.68	3.96	X	7.4	Max Detect	7.4	Max Detect
Inorganics	Chromium, hexavalent	mg/kg	0-0.5	16	25	64	0.24	8.3	0.1	0.25	1.984	1.306	0.845	5.443	2.333	X	3.197	KM H-UCL	2.14	Bootstrap BCA 95UCL
Inorganics	Chromium, total	mg/kg	0-0.5	29	29	100	5.6	100	N/A	N/A	30.67	30.67	25	438.1	20.93	X [e]	37.84	95% Adjusted Gamma UCL	46.1	Bootstrap BCA 95UCL
Inorganics	Cobalt	mg/kg	0-0.5	40	41	98	2.3	27	2.7	2.7	6.313	6.215	5.55	14.49	3.806	--	--	--	--	--
Inorganics	Copper	mg/kg	0-0.5	29	29	100	2.8	270	N/A	N/A	24.09	24.09	13	2297	47.92	X [e]	39.22	95% Student's-t UCL	43.6	Bootstrap BCA 95UCL
Inorganics	Cyanide	mg/kg	0-0.5	0	5	0	NA	NA	0.1	0.55	NA	NA	NA	NA	NA	--	--	--	--	--
Inorganics	Iron	mg/kg	0-0.5	6	6	100	10000	32000	NA	NA	18667	18667	18000	62266667	7891	--	--	--	--	--
Inorganics	Lead	mg/kg	0-0.5	42	42	100	1.9	920	NA	NA	40.28	40.28	10.85	20265	142.4	X	37.6	95% H-UCL	84.6	Bootstrap BCA 95UCL
Inorganics	Manganese	mg/kg	0-0.5	6	6	100	210	310	NA	NA	253.3	253.3	250	1187	34.45	--	--	--	--	--
Inorganics	Mercury	mg/kg	0-0.5	11	42	26	0.11	35	0.0495	0.06	3.361	0.917	0.14	110.1	10.49	X	4.67	95% KM (Chebyshev) UCL	4.62	Bootstrap BCA 95UCL
Inorganics	Molybdenum	mg/kg	0-0.5	6	41	15	1	19	0.5	2.7	6.967	1.448	5.4	51.72	7.192	X	2.43	95% KM (t) UCL	1.91	Bootstrap BCA 95UCL
Inorganics	Nickel	mg/kg	0-0.5	50	50	100	3.6	34	NA	NA	14.43	14.43	13	37.77	6.146	X	16	95% Approximate Gamma UCL	16.7	Bootstrap BCA 95UCL
Inorganics	Selenium	mg/kg	0-0.5	0	41	0	NA	NA	0.5	0.6	NA	NA	NA	NA	NA	--	--	--	--	--
Inorganics	Silver	mg/kg	0-0.5	0	41	0	NA	NA	0.5	2.7	NA	NA	NA	NA	NA	--	--	--	--	--
Inorganics	Thallium	mg/kg	0-0.5	0	41	0	NA	NA	1	5.5	NA	NA	NA	NA	NA	--	--	--	--	--
Inorganics	Vanadium	mg/kg	0-0.5	41	41	100	12	38	NA	NA	25.07	25.07	25	42.92	6.551	--	--	--	--	--
Inorganics	Zinc	mg/kg	0-0.5	50	50	100	13	1000	NA	NA	138.7	138.7	58.5	49445	222.4	X	276	95% Chebyshev (Mean, Sd) UCL	126	Bootstrap BCA 95UCL
Volatile Organic Compounds	1,2,4-Trimethylbenzene	µg/kg	0-0.5	0	1	0	NA	NA	3.55	3.55	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	1,3,5-Trimethylbenzene	µg/kg	0-0.5	0	1	0	NA	NA	3.55	3.55	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Acetone	µg/kg	0-0.5	0	1	0	NA	NA	35.5	35.5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Bromomethane	µg/kg	0-0.5	0	1	0	NA	NA	3.55	3.55	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Chloro methane	µg/kg	0-0.5	0	1	0	NA	NA	3.55	3.55	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Chloroform	µg/kg	0-0.5	0	1	0	NA	NA	3.55	3.55	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Ethyl- benzene	µg/kg	0-0.5	0	1	0	NA	NA	3.55	3.55	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Isopropylbenzene	µg/kg	0-0.5	0	1	0	NA	NA	3.55	3.55	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Methyl acetate	µg/kg	0-0.5	0	1	0	NA	NA	3.55	3.55	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Methyl ethyl ketone	µg/kg	0-0.5	0	1	0	NA	NA	35.5	35.5	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Methylene chloride	µg/kg	0-0.5	0	1	0	NA	NA	3.55	3.55	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	N-Butylbenzene	µg/kg	0-0.5	0	1	0	NA	NA	3.55	3.55	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	N-Propylbenzene	µg/kg	0-0.5	0	1	0	NA	NA	3.55	3.55	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	sec-Butylbenzene	µg/kg	0-0.5	0	1	0	NA	NA	3.55	3.55	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Toluene	µg/kg	0-0.5	0	1	0	NA	NA	3.55	3.55	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Xylene, m,p-	µg/kg	0-0.5	0	1	0	NA	NA	3.55	3.55	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Xylene, o-	µg/kg	0-0.5	0	1	0	NA	NA	3.55	3.55	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Xylenes, total	µg/kg	0-0.5	0	1	0	NA	NA	3.55	3.55	NA	NA	NA	NA	NA	--	--	--	--	--
Semi-Volatile Organic Compounds	4-Methylphenol	µg/kg	0-0.5	0	27	0	NA	NA	165	41500	NA	NA	NA	NA	NA	--	--	--	--	--
Semi-Volatile Organic Compounds	Bis (2-ethylhexyl) phthalate	µg/kg	0-0.5	0	27	0	NA	NA	165	41500	NA	NA	NA	NA	NA	--	--	--	--	--
Semi-Volatile Organic Compounds	Butylbenzylphthalate	µg/kg	0-0.5	0	27	0	NA	NA	165	41500	NA	NA	NA	NA	NA	--	--	--	--	--
Semi-Volatile Organic Compounds	Di-n-butyl phthalate	µg/kg	0-0.5	0	27	0	NA	NA	165	41500	NA	NA	NA	NA	NA	--	--	--	--	--
Semi-Volatile Organic Compounds	Isophorone	µg/kg	0-0.5	1	27	4	2800	2800	165	41500	2800	270.4	2800	NA	NA	X	2800	Max Detect	2800	Max Detect

Table AOC9-3.1
Summary Statistics for Depth-Weighted Soil Data and Exposure Point Concentrations for the Baseline (No Scouring) Scenario for AOC 9 (0 to 0.5 foot bgs and 0 to 3 feet bgs)

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PG&E Topock Compressor Station
Needles, California

Category	Constituent [a]	Units	Soil Depth Interval (ft bgs)	Detects	Total	Frequency of Detection	Minimum Detect	Maximum Detect	Minimum Nondetect	Maximum Nondetect	Mean Detected	Kaplan Meier Mean	Median	Variance	Standard Deviation	C O P C/ C O P E C? [b]	EPC (Depth-Weighted UCL) [c,d]	EPC Basis (Depth-Weighted UCL)	EPC (Area-Weighted UCL) [c,d]	EPC Basis (Area-Weighted UCL)
Polycyclic Aromatic Hydrocarbons	PAH low molecular weight	µg/kg	0-0.5	26	41	63	5.5	859	0	0	132.7	84.14	27.4	54511	233.5	X	390	99% KM (Chebyshev) UCL	103	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	PAH high molecular weight	µg/kg	0-0.5	34	41	83	18.7	32900	0	0	2474	2052	234	41377015	6432	X	11272	99% KM (Chebyshev) UCL	2828	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	1-Methyl naphthalene	µg/kg	0-0.5	3	41	7	5.9	160	2.5	125	57.37	6.534	6.2	7900	88.88	X	160	Max Detect	160	Max Detect
Polycyclic Aromatic Hydrocarbons	2-Methyl naphthalene	µg/kg	0-0.5	3	41	7	9.8	120	2.5	125	47.6	5.912	13	3934	62.72	X	120	Max Detect	120	Max Detect
Polycyclic Aromatic Hydrocarbons	Acenaphthene	µg/kg	0-0.5	3	41	7	5.1	8.5	2.5	125	7.3	2.889	8.3	3.64	1.908	X	8.5	Max Detect	8.5	Max Detect
Polycyclic Aromatic Hydrocarbons	Acenaphthylene	µg/kg	0-0.5	3	41	7	6.2	26	2.5	125	19.07	3.811	25	124.4	11.15	X	26	Max Detect	26	Max Detect
Polycyclic Aromatic Hydrocarbons	Anthracene	µg/kg	0-0.5	6	41	15	5.9	95	2.5	125	51.82	9.9	48.5	1308	36.17	X	16.3	95% KM (t) UCL	14.6	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Benzo (a) anthracene	µg/kg	0-0.5	26	41	63	6.2	1200	2.5	1900	147.4	97.37	30.5	95822	309.6	X	276	95% KM (Chebyshev) UCL	186	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Benzo (a) pyrene	µg/kg	0-0.5	30	41	73	6.6	4400	2.5	125	317.6	234.3	22	748295	865	X	747	95% KM (Chebyshev) UCL	352	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Benzo (b) fluoranthene	µg/kg	0-0.5	32	41	78	8.5	15000	2.5	125	756.4	592.5	32.5	7206534	2684	X	2221	95% KM (Chebyshev) UCL	1263	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Benzo (ghi) perylene	µg/kg	0-0.5	29	41	71	5.1	1400	2.5	1900	133.5	98.57	19	97272	311.9	X	286	95% KM (Chebyshev) UCL	183	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Benzo (k) fluoranthene	µg/kg	0-0.5	27	41	66	6.1	5800	2.5	125	339.7	225.7	20	1263266	1124	X	856	95% KM (Chebyshev) UCL	492	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Chrysene	µg/kg	0-0.5	33	41	80	5.1	5200	2.5	125	349.9	282.7	27	945401	972.3	X	884	95% KM (Chebyshev) UCL	426	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Dibenzo (a,h) anthracene	µg/kg	0-0.5	7	41	17	5.1	340	2.5	1900	58.13	12.47	12	15461	124.3	X	51.6	95% KM (Chebyshev) UCL	162	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Fluoranthene	µg/kg	0-0.5	32	41	78	10	2600	2.5	125	283.8	222.8	49.5	343531	586.1	X	584	95% KM (Chebyshev) UCL	274	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Fluorene	µg/kg	0-0.5	2	41	5	6.6	9.8	2.5	125	8.2	2.808	8.2	5.12	2.263	X	9.8	Max Detect	9.8	Max Detect
Polycyclic Aromatic Hydrocarbons	Indeno (1,2,3-cd) pyrene	µg/kg	0-0.5	27	41	66	5.5	1100	2.5	1900	127.3	87.7	18	76123	275.9	X	249	95% KM (Chebyshev) UCL	172	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Naphthalene	µg/kg	0-0.5	3	41	7	12	16	2.5	125	14	3.415	14	4	2	X	16	Max Detect	16	Max Detect
Polycyclic Aromatic Hydrocarbons	Phenanthrene	µg/kg	0-0.5	26	41	63	5.5	780	2.5	125	103.1	66.72	26	39036	197.6	X	114	KM H-UCL	95.9	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Pyrene	µg/kg	0-0.5	32	41	78	9.7	2600	2.5	12.5	280.5	219.5	45.5	329495	574	X	574	95% KM (Chebyshev) UCL	265	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	B(a)P equivalent	µg/kg	0-0.5	34	41	83	6.5	8200	5.8	56	481.9	400.9	44	2139888	1463	X	1316	95% KM (Chebyshev) UCL	651	Bootstrap BCA 95UCL
Pesticides	4,4-DDE	µg/kg	0-0.5	1	15	7	3.2	3.2	1	2	3.2	1.147	3.2	NA	NA	X	3.2	Max Detect	3.2	Max Detect
Pesticides	4,4-DDT	µg/kg	0-0.5	0	15	0	NA	NA	1	2	NA	NA	NA	NA	NA	--	--	--	--	--
Pesticides	Alpha-Chlordane	µg/kg	0-0.5	0	15	0	NA	NA	0.5	1	NA	NA	NA	NA	NA	--	--	--	--	--
Pesticides	Dieldrin	µg/kg	0-0.5	0	15	0	NA	NA	1	2	NA	NA	NA	NA	NA	--	--	--	--	--
Pesticides	Gamma-Chlordane	µg/kg	0-0.5	0	15	0	NA	NA	0.5	1	NA	NA	NA	NA	NA	--	--	--	--	--
Polychlorinated Biphenyls	Total PCBs	µg/kg	0-0.5	17	30	57	45.5	1330	18	49.5	254.9	152.4	127	125823	354.7	X	250	KM H-UCL	299	Bootstrap BCA 95UCL
Dioxins	TEQ Human	ng/kg	0-0.5	9	9	100	1.8	190	N/A	N/A	63.18	63.18	28	4037	63.53	X	102.6	95% Student's-t UCL	105	Bootstrap BCA 95UCL
Dioxins	TEQ Avian	ng/kg	0-0.5	9	9	100	2.4	88	N/A	N/A	42.44	42.44	41	1065	32.63	X	62.67	95% Student's-t UCL	64.1	Bootstrap BCA 95UCL
Dioxins	TEQ Mammals	ng/kg	0-0.5	9	9	100	1.8	190	N/A	N/A	63.18	63.18	28	4037	63.53	X [e]	102.6	95% Student's-t UCL	105	Bootstrap BCA 95UCL
Dioxins	2,3,7,8-TCDD	ng/kg	0-0.5	3	17	18	0.6	3.7	0.045	5	2.333	0.505	2.7	2.503	1.582	X	3.7	Max Detect	3.7	Max Detect
Total Petroleum Hydrocarbons	TPH as diesel	mg/kg	0-0.5	9	32	28	24	4000	5	107	719.4	206.4	47	1972554	1404	X	837	95% KM (Chebyshev) UCL	271	Bootstrap BCA 95UCL
Total Petroleum Hydrocarbons	TPH as motor oil	mg/kg	0-0.5	24	32	75	11.8	8900	5	50.5	674.1	507.3	50.4	4044042	2011	X	1868	95% KM (Chebyshev) UCL	622	Bootstrap BCA 95UCL
Inorganics	Aluminum	mg/kg	0-3	6	6	100	4100	13000	NA	NA	7972	7972	8000	11463617	3386	--	--	--	--	--
Inorganics	Antimony	mg/kg	0-3	1	41	2	10.3	10.3	1	1.15	10.3	1.227	10.3	NA	NA	X	10.3	Max Detect	10.3	Max Detect
Inorganics	Arsenic	mg/kg	0-3	41	41	100	2.27	11	NA	NA	4.766	4.766	3.93	4.29	2.071	X	5.32	95% Modified-t UCL	4.37	Bootstrap BCA 95UCL
Inorganics	Barium	mg/kg	0-3	41	41	100	58.7	263	NA	NA	123.5	123.5	117	2064	45.43	--	--	--	--	--
Inorganics	Beryllium	mg/kg	0-3	0	41	0	NA	NA	0.5	2.13	NA	NA	NA	NA	NA	--	--	--	--	--
Inorganics	Cadmium	mg/kg	0-3	4	41	10	0.7	5.1	0.5	0.567	2.191	0.665	1.482	4.098	2.024	X	0.89	95% KM (t) UCL	0.869	Bootstrap BCA 95UCL
Inorganics	Chromium, hexavalent	mg/kg	0-3	23	36	64	0.197	8.3	0.1	0.25	1.467	0.974	0.8	3.203	1.79	X	1.657	95% KM Adjusted Gamma UCL	1.41	Bootstrap BCA 95UCL
Inorganics	Chromium, total	mg/kg	0-3	40	40	100	5.63	89.3	N/A	N/A	27.76	27.76	24.3	338.3	18.39	X	32.66	95% Student's-t UCL	35.9	Bootstrap BCA 95UCL
Inorganics	Cobalt	mg/kg	0-3	41	41	100	2.37	19	NA	NA	6.118	6.118	5.5	8.291	2.879	--	--	--	--	--
Inorganics	Copper	mg/kg	0-3	40	40	100	3.23	270	N/A	N/A	19.96	19.96	11.65	1692	41.13	X	21.06	95% H-UCL	34.9	Bootstrap BCA 95UCL
Inorganics	Cyanide	mg/kg	0-3	0	5	0	NA	NA	0.1	0.55	NA	NA	NA	NA	NA	--	--	--	--	--
Inorganics	Iron	mg/kg	0-3	6	6	100	8600	32000	NA	NA	18433	18433	18000	67446667	8213	--	--	--	--	--
Inorganics	Lead	mg/kg	0-3	42	42	100	1.9	614	NA	NA	33.81	33.81	12.3	9408	97	X	36.4	95% H-UCL	54.7	Bootstrap BCA 95UCL
Inorganics	Manganese	mg/kg	0-3	6	6	100	210	310	NA	NA	246.7	246.7	240	1507	38.82	--	--	--	--	--
Inorganics	Mercury	mg/kg	0-3	14	42	33	0.07	23.3	0.0497	0.06	1.882	0.661	0.115	38.1	6.172	X	3.13	95% KM (Chebyshev) UCL	2.15	Bootstrap BCA 95UCL
Inorganics	Molybdenum	mg/kg	0-3	9	41	22	0.8	19	0.5	2.13	4.979	1.488	1.58	36.84	6.069	X	2.4	95% KM (t) UCL	2.12	Bootstrap BCA 95UCL
Inorganics	Nickel	mg/kg	0-3	50	50	100	3.8	32	NA	NA	14.36	14.36	13.6	33.49	5.787	X	15.7	95% Student's-t UCL	16.4	Bootstrap BCA 95UCL
Inorganics	Selenium	mg/kg	0-3	0	41	0	NA	NA	0.5	0.567	NA	NA	NA	NA	NA	--	--	--	--	--

Table AOC9-3.1
Summary Statistics for Depth-Weighted Soil Data and Exposure Point Concentrations for the Baseline (No Scouring) Scenario for AOC 9 (0 to 0.5 foot bgs and 0 to 3 feet bgs)

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

Category	Constituent [a]	Units	Soil Depth Interval (ft bgs)	Detects	Total	Frequency of Detection	Minimum Detect	Maximum Detect	Minimum Nondetect	Maximum Nondetect	Mean Detected	Kaplan Meier Mean	Median	Variance	Standard Deviation	C O P C/ C O P E C? [b]	EPC (Depth-Weighted UCL) [c,d]	EPC Basis (Depth-Weighted UCL)	EPC (Area-Weighted UCL) [c,d]	EPC Basis (Area-Weighted UCL)
Inorganics	Silver	mg/kg	0-3	0	41	0	NA	NA	0.5	2.13	NA	NA	NA	NA	NA	--	--	--	--	--
Inorganics	Thallium	mg/kg	0-3	1	41	2	1.52	1.52	1	4.35	1.52	1.016	1.52	NA	NA	X	1.52	Max Detect	1.52	Max Detect
Inorganics	Vanadium	mg/kg	0-3	41	41	100	13.7	38.7	NA	NA	24.93	24.93	24.7	39	6.245	--	--	--	--	--
Inorganics	Zinc	mg/kg	0-3	50	50	100	13	1000	NA	NA	132.6	132.6	59.2	43972	209.7	X	262	95% Chebyshev (Mean, Sd) UCL	123	Bootstrap BCA 95UCL
Volatile Organic Compounds	1,2,4-Trimethylbenzene	µg/kg	0-3	0	16	0	NA	NA	2	70	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	1,3,5-Trimethylbenzene	µg/kg	0-3	0	16	0	NA	NA	2	70	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Acetone	µg/kg	0-3	0	9	0	NA	NA	20	45.2	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Bromomethane	µg/kg	0-3	0	16	0	NA	NA	2	4.52	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Chloro methane	µg/kg	0-3	0	16	0	NA	NA	2	4.52	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Chloroform	µg/kg	0-3	0	16	0	NA	NA	2	4.52	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Ethyl- benzene	µg/kg	0-3	0	16	0	NA	NA	2	4.52	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Isopropylbenzene	µg/kg	0-3	0	16	0	NA	NA	2	70	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Methyl acetate	µg/kg	0-3	0	4	0	NA	NA	2.15	3.55	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Methyl ethyl ketone	µg/kg	0-3	0	16	0	NA	NA	20	45.2	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Methylene chloride	µg/kg	0-3	0	16	0	NA	NA	2	4.52	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	N-Butylbenzene	µg/kg	0-3	0	16	0	NA	NA	2	70	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	N-Propylbenzene	µg/kg	0-3	0	16	0	NA	NA	2	70	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	sec-Butylbenzene	µg/kg	0-3	0	16	0	NA	NA	2	70	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Toluene	µg/kg	0-3	0	16	0	NA	NA	2	4.52	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Xylene, m,p-	µg/kg	0-3	0	16	0	NA	NA	2	4.52	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Xylene, o-	µg/kg	0-3	0	16	0	NA	NA	2	4.52	NA	NA	NA	NA	NA	--	--	--	--	--
Volatile Organic Compounds	Xylenes, total	µg/kg	0-3	0	16	0	NA	NA	2	4.52	NA	NA	NA	NA	NA	--	--	--	--	--
Semi-Volatile Organic Compounds	4-Methylphenol	µg/kg	0-3	0	27	0	NA	NA	165	27900	NA	NA	NA	NA	NA	--	--	--	--	--
Semi-Volatile Organic Compounds	Bis (2-ethylhexyl) phthalate	µg/kg	0-3	0	27	0	NA	NA	165	27900	NA	NA	NA	NA	NA	--	--	--	--	--
Semi-Volatile Organic Compounds	Butylbenzylphthalate	µg/kg	0-3	0	27	0	NA	NA	165	27900	NA	NA	NA	NA	NA	--	--	--	--	--
Semi-Volatile Organic Compounds	Di-n-butyl phthalate	µg/kg	0-3	0	27	0	NA	NA	165	27900	NA	NA	NA	NA	NA	--	--	--	--	--
Semi-Volatile Organic Compounds	Isophorone	µg/kg	0-3	2	27	7	1040	28600	165	10500	14820	1253	14820	380000000	19488	X	28600	Max Detect	28600	Max Detect
Polycyclic Aromatic Hydrocarbons	PAH low molecular weight	µg/kg	0-3	31	41	76	2.17	584	0	0	97.65	73.83	18.5	25354	159.2	X	299	99% KM (Chebyshev) UCL	86.7	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	PAH high molecular weight	µg/kg	0-3	37	41	90	18.7	21900	0	0	1739	1569	184	18142222	4259	X	7909	99% KM (Chebyshev) UCL	2075	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	1-Methyl naphthalene	µg/kg	0-3	5	41	12	4.13	180	2.5	85.9	45.36	7.794	16.8	5718	75.62	X	25.1	Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	14	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	2-Methyl naphthalene	µg/kg	0-3	5	41	12	7.37	160	2.5	85.9	42.2	7.414	13.7	4361	66.04	X	5.8	KM H-UCL	13.1	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Acenaphthene	µg/kg	0-3	4	41	10	3.73	6.53	2.5	85.9	5.223	2.797	5.315	2.074	1.44	X	3.1	95% KM (t) UCL	8.9	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Acenaphthylene	µg/kg	0-3	3	41	7	4.98	18.2	2.5	85.9	13.56	3.377	17.5	55.33	7.439	X	18.2	Max Detect	18.2	Max Detect
Polycyclic Aromatic Hydrocarbons	Anthracene	µg/kg	0-3	8	41	20	3.97	86	2.5	85.9	33.55	8.662	19.55	838.2	28.95	X	13.5	95% KM (t) UCL	12.2	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Benzo (a) anthracene	µg/kg	0-3	29	41	71	5.58	801	2.5	1270	116	85.44	23.9	47133	217.1	X	218	95% KM (Chebyshev) UCL	149	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Benzo (a) pyrene	µg/kg	0-3	32	41	78	5.25	2930	2.5	93.8	223	175.9	21.85	322333	567.7	X	523	95% KM (Chebyshev) UCL	250	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Benzo (b) fluoranthene	µg/kg	0-3	34	41	83	7.18	10000	2.5	93.8	518.7	431.9	36.25	3037804	1743	X	1520	95% KM (Chebyshev) UCL	870	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Benzo (ghi) perylene	µg/kg	0-3	31	41	76	4.98	1400	2.5	1270	104.5	82.06	13.7	73805	271.7	X	246	95% KM (Chebyshev) UCL	153	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Benzo (k) fluoranthene	µg/kg	0-3	30	41	73	5.53	3870	2.5	93.8	220.7	163.3	18.7	509551	713.8	X	584	95% KM (Chebyshev) UCL	329	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Chrysene	µg/kg	0-3	36	41	88	5.1	3470	2.5	84.2	237.4	209.2	24	395409	628.8	X	614	95% KM (Chebyshev) UCL	295	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Dibenzo (a,h) anthracene	µg/kg	0-3	9	41	22	4.23	340	2.5	1270	47.71	12.99	11.1	12041	109.7	X	51.4	95% KM (Chebyshev) UCL	110	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Fluoranthene	µg/kg	0-3	36	41	88	5.13	1730	2.5	2.55	211.3	185.8	41.1	159565	399.5	X	445	95% KM (Chebyshev) UCL	239	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Fluorene	µg/kg	0-3	2	41	5	5.25	7.4	2.5	85.9	6.325	2.709	6.325	2.311	1.52	X	7.4	Max Detect	7.4	Max Detect
Polycyclic Aromatic Hydrocarbons	Indeno (1,2,3-cd) pyrene	µg/kg	0-3	30	41	73	4.52	1100	2.5	1270	94.79	72.94	13.05	51686	227.3	X	92	KM H-UCL	132	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Naphthalene	µg/kg	0-3	5	41	12	3.6	21.3	2.33	85.9	9.744	3.304	8.85	49.26	7.019	X	4.32	95% KM (t) UCL	9.24	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Phenanthrene	µg/kg	0-3	30	41	73	5.67	531	2.5	2.68	77.49	57.37	19.95	16561	128.7	X	111	KM H-UCL	75.5	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	Pyrene	µg/kg	0-3	35	41	85	5.47	1730	2.5	9.17	209	178.8	34	158629	398.3	X	434	95% KM (Chebyshev) UCL	224	Bootstrap BCA 95UCL
Polycyclic Aromatic Hydrocarbons	B(a)P equivalent	µg/kg	0-3	37	41	90	6.5	5470	5.8	22.5	333.5	301.7	40.3	904682	951.1	X	920	95% KM (Chebyshev) UCL	467	Bootstrap BCA 95UCL
Pesticides	4,4-DDE	µg/kg	0-3	1	15	7	3.2	3.2	1	1.67	3.2	1.147	3.2	NA	NA	X	3.2	Max Detect	3.2	Max Detect
Pesticides	4,4-DDT	µg/kg	0-3	0	15	0	NA	NA	1	1.67	NA	NA	NA	NA	NA	--	--	--	--	--
Pesticides	Alpha-Chlordane	µg/kg	0-3	0	15	0	NA	NA	0.5	0.833	NA	NA	NA	NA	NA	--	--	--	--	--
Pesticides	Dieldrin	µg/kg	0-3	0	15	0	NA	NA	1	1.67	NA	NA	NA	NA	NA	--	--	--	--	--

Table AOC9-3.1
Summary Statistics for Depth-Weighted Soil Data and Exposure Point Concentrations for the Baseline (No Scouring) Scenario for AOC 9 (0 to 0.5 foot bgs and 0 to 3 feet bgs)

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

Category	Constituent [a]	Units	Soil Depth Interval (ft bgs)	Detects	Total	Frequency of Detection	Minimum Detect	Maximum Detect	Minimum Nondetect	Maximum Nondetect	Mean Detected	Kaplan Meier Mean	Median	Variance	Standard Deviation	C O P C/ C O P E C? [b]	EPC (Depth-Weighted UCL) [c,d]	EPC Basis (Depth-Weighted UCL)	EPC (Area-Weighted UCL) [c,d]	EPC Basis (Area-Weighted UCL)
Pesticides	Gamma-Chlordane	µg/kg	0-3	0	15	0	NA	NA	0.5	0.833	NA	NA	NA	NA	NA	--	--	--	--	--
Polychlorinated Biphenyls	Total PCBs	µg/kg	0-3	19	30	63	40.7	1660	18	41.5	232.1	153.7	89	162872	403.6	X	219	KM H-UCL	346	Bootstrap BCA 95UCL
Dioxins	TEQ Human	ng/kg	0-3	20	20	100	0.28	130	N/A	N/A	37.32	37.32	22.85	1932	43.96	X	73.28	95% Adjusted Gamma UCL	70	Bootstrap BCA 95UCL
Dioxins	TEQ Avian	ng/kg	0-3	20	20	100	0.28	88	N/A	N/A	22.37	22.37	10.35	676.2	26	X	42.49	95% Adjusted Gamma UCL	46	Bootstrap BCA 95UCL
Dioxins	TEQ Mammals	ng/kg	0-3	20	20	100	0.28	130	N/A	N/A	37.32	37.32	22.85	1932	43.96	X	73.28	95% Adjusted Gamma UCL	70.4	Bootstrap BCA 95UCL
Dioxins	2,3,7,8-TCDD	ng/kg	0-3	5	18	28	0.293	3.7	0.0452	5	1.258	0.453	0.815	1.951	1.397	X	1.31	Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	1.07	Bootstrap BCA 95UCL
Total Petroleum Hydrocarbons	TPH as diesel	mg/kg	0-3	11	32	34	7.67	2670	5	107	422.9	148.9	77	684921	827.6	X	553	Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	211	Bootstrap BCA 95UCL
Total Petroleum Hydrocarbons	TPH as gasoline	mg/kg	0-3	0	24	0	NA	NA	0.39	33	NA	NA	NA	NA	NA	--	--	--	--	--
Total Petroleum Hydrocarbons	TPH as motor oil	mg/kg	0-3	26	32	81	8.07	5940	5	35.3	474.5	386.7	51.95	1551689	1246	X	1264	95% KM (Chebyshev) UCL	514	Bootstrap BCA 95UCL

Notes:

[a] The constituents presented consists of analytes detected at least once at the Topock Compressor Station site and measured in soil in this exposure area. The datasets for chromium (total and hexavalent), copper, and dioxins (TEQ Human, TEQ Mammal, and TEQ Avian) were updated to reflect the non-time critical removal actions outlined in Arcadis (2024).

[b] COPCs selected in the 2019 Soil Risk Assessment (Arcadis 2019) were also evaluated in this Post-Soil N T C R A HHERA; and only risk-driving COPECs were evaluated in this Post-Soil N T C R A HHERA (see footnote e).

[c] If fewer than eight total locations and four total detected concentrations, the maximum depth-weighted concentration was selected as the EPC. Otherwise, the UCL was selected as the EPC.

[d] EPCs and summary statistics were not calculated for some constituents (i.e., dioxin congeners and essential nutrients). Those data, if available, are presented in Attachment A1 of each exposure area-specific appendix in the Soil Human Health and Ecological Risk Assessment Report (Arcadis 2019).

[e] Identifed as a COPEC for the Post-Soil N T C R A HHERA.

Abbreviations:

"--" = not applicable
AOC = area of concern
B(a)P equivalent = benzo(a)pyrene equivalent
BCA = Bias-corrected accelerated bootstrap method
COPC = constituent of potential concern
COPEC = constituent of potential ecological concern
DDE = Dichlorodiphenyldichloroethylene
DDT = Dichlorodiphenyltrichloroethane
EPC = exposure point concentration
FOD = frequency of detection
ft bgs = feet below ground surface
KM = Kaplan-Meier
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
NA = not applicable
ND = not detected
ng/kg = nanograms per kilogram
PAH = polycyclic aromatic hydrocarbons
PCB = polychlorinated biphenyls
PG&E = Pacific Gas and Electric Company
TCDD = Tetrachlorodibenzo-p-dioxin
TEQ = toxic equivalent
TPH = total petroleum hydrocarbons
UCL = upper confidence limit
X = COPC/COPEC in the exposure depth interval

References:

Arcadis. 2019. Final Soil Human Health and Ecological Risk Assessment Report, Topock Compressor Station, Needles, California.
Arcadis. 2024. Soil Risk Assessment Addendum: Proposed Approach to Update the Human Health and Ecological Risk Assessment after Completion of the 2023 Non-Time Critical Removal Action. January 30.

Table AOC9-4.1
Summary of C O P Cs Evaluated in the HHRA for AOC 9: Baseline Scenario

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	C O P Cs in Surface Soil (0 to 0.5 foot bgs)	C O P Cs in Shallow Soil (0 to 3 feet bgs)	C O P Cs in Subsurface II Soil (0 to 10 feet bgs)
Inorganics			
Antimony	x	x	x
Arsenic	x	x	x
Chromium, Hexavalent	x	x	x
Chromium, total	x	x	x
Copper	x	x	x
Lead	x	x	x
Mercury (inorganic)	x	x	x
Nickel	x	x	x
Thallium	--	x	x
Zinc	x	x	x
Volatile Organic Compounds			
Isophorone	x	x	x
Polycyclic Aromatic Hydrocarbons			
1-Methyl naphthalene	x	x	x
2-Methyl naphthalene	x	x	x
Acenaphthene	x	x	x
Acenaphthylene	x	x	x
Anthracene	x	x	x
Benzo (a) anthracene	x	x	x
Benzo (a) pyrene	x	x	x
Benzo (b) fluoranthene	x	x	x
Benzo (ghi) perylene	x	x	x
Benzo (k) fluoranthene	x	x	x
Chrysene	x	x	x
Dibenzo (a,h) anthracene	x	x	x
Fluoranthene	x	x	x
Fluorene	x	x	x
Indeno (1,2,3-cd) pyrene	x	x	x
Naphthalene	x	x	x
Phenanthrene	x	x	x

Table AOC9-4.1
Summary of C O P Cs Evaluated in the HHRA for AOC 9: Baseline Scenario

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	C O P Cs in Surface Soil (0 to 0.5 foot bgs)	C O P Cs in Shallow Soil (0 to 3 feet bgs)	C O P Cs in Subsurface II Soil (0 to 10 feet bgs)
Pyrene	x	x	x
B(a)P Equivalent	x	x	x
Pesticides			
4,4-DDE	x	x	x
Polychlorinated Biphenyls			
Total PCBs	x	x	x
Total Petroleum Hydrocarbons			
TPH as diesel	x	x	x
TPH as motor oil	x	x	x
Dioxins/Furans			
TEQ Human	x	x	x

Abbreviations:
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
C O P C = Constituent of Potential Concern.
-- = not detected or not analyzed.
x = Chemical included as C O P C in human health risk assessment.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC9-4.2a
Baseline Scenario Depth-Weighted Exposure Point Concentrations and Predicted Outdoor Air Concentrations for Recreational Users:
C O P Cs in AOC 9 Surface Soil (0 to 0.5 foot bgs)

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

COPC	Exposure Point Concentration for Surface Soil: 0 to 0.5 foot bgs (mg/kg) [a]	Exposure Point Concentration for Subsurface II Soil: 0 to 10 feet bgs (mg/kg) [b]	Recreational User - Camper Outdoor Airborne Particulate Concentration (mg/m^3) [c]	Recreational User - Camper Outdoor Vapor Concentration (mg/m^3) [d]	Recreational User - Hiker Outdoor Airborne Particulate Concentration (mg/m^3) [c]	Recreational User - Hiker Outdoor Vapor Concentration (mg/m^3) [d]	Recreational User - Off Highway Vehicle Rider Outdoor Airborne Particulate Concentration (mg/m^3) [e]	Recreational User - Off Highway Vehicle Rider Outdoor Vapor Concentration (mg/m^3) [d]
Inorganics								
Antimony	1.5E+01	3.8E+00	1.1E-08	NV	1.1E-08	NV	1.8E-05	NV
Arsenic	5.5E+00	5.0E+00	4.0E-09	NV	4.0E-09	NV	6.4E-06	NV
Chromium, Hexavalent	3.2E+00	6.5E+01	2.4E-09	NV	2.4E-09	NV	3.8E-06	NV
Chromium, total	3.8E+01	6.1E+01	2.8E-08	NV	2.8E-08	NV	4.5E-05	NV
Copper	3.9E+01	1.1E+02	2.9E-08	NV	2.9E-08	NV	4.6E-05	NV
Lead	3.8E+01	3.1E+01	2.8E-08	NV	2.8E-08	NV	4.4E-05	NV
Mercury (inorganic)	4.7E+00	1.1E+00	3.4E-09	NV	3.4E-09	NV	5.5E-06	NV
Nickel	1.6E+01	1.6E+01	1.2E-08	NV	1.2E-08	NV	1.9E-05	NV
Thallium	ND	1.9E+00	NA	NV	NA	NV	NA	NV
Zinc	2.8E+02	2.3E+02	2.0E-07	NV	2.0E-07	NV	3.3E-04	NV
Volatile Organic Compounds								
Isophorone	2.8E+00	1.7E+01	2.1E-09	NV	2.1E-09	NV	3.3E-06	NV
Polycyclic Aromatic Hydrocarbons								
1-Methyl naphthalene	1.6E-01	2.9E-02	1.2E-10	4.0E-07	1.2E-10	4.0E-07	1.9E-07	4.0E-07
2-Methyl naphthalene	1.2E-01	3.0E-02	8.8E-11	4.0E-07	8.8E-11	4.0E-07	1.4E-07	4.0E-07
Acenaphthene	8.5E-03	3.4E-03	6.3E-12	1.9E-08	6.3E-12	1.9E-08	1.0E-08	1.9E-08
Acenaphthylene	2.6E-02	7.3E-03	1.9E-11	NV	1.9E-11	NV	3.1E-08	NV
Anthracene	1.6E-02	1.9E-02	1.2E-11	2.9E-08	1.2E-11	2.9E-08	1.9E-08	2.9E-08
Benzo (a) anthracene	2.8E-01	1.7E-01	2.0E-10	3.1E-08	2.0E-10	3.1E-08	3.3E-07	3.1E-08
Benzo (a) pyrene	7.5E-01	2.3E-01	5.5E-10	NV	5.5E-10	NV	8.8E-07	NV
Benzo (b) fluoranthene	2.2E+00	5.6E-01	1.6E-09	NV	1.6E-09	NV	2.6E-06	NV
Benzo (ghi) perylene	2.9E-01	2.1E-01	2.1E-10	NV	2.1E-10	NV	3.4E-07	NV
Benzo (k) fluoranthene	8.6E-01	2.1E-01	6.3E-10	NV	6.3E-10	NV	1.0E-06	NV
Chrysene	8.8E-01	2.7E-01	6.5E-10	NV	6.5E-10	NV	1.0E-06	NV
Dibenzo (a,h) anthracene	5.2E-02	5.0E-02	3.8E-11	NV	3.8E-11	NV	6.1E-08	NV
Fluoranthene	5.8E-01	3.5E-01	4.3E-10	NV	4.3E-10	NV	6.9E-07	NV
Fluorene	9.8E-03	4.8E-03	7.2E-12	1.3E-08	7.2E-12	1.3E-08	1.2E-08	1.3E-08
Indeno (1,2,3-cd) pyrene	2.5E-01	5.7E-02	1.8E-10	NV	1.8E-10	NV	2.9E-07	NV
Naphthalene	1.6E-02	4.7E-03	1.2E-11	8.0E-08	1.2E-11	8.0E-08	1.9E-08	8.0E-08
Phenanthrene	1.1E-01	9.2E-02	8.4E-11	NV	8.4E-11	NV	1.3E-07	NV
Pyrene	5.7E-01	3.2E-01	4.2E-10	1.0E-07	4.2E-10	1.0E-07	6.8E-07	1.0E-07
B(a)P Equivalent	1.3E+00	4.0E-01	9.7E-10	NV	9.7E-10	NV	1.6E-06	NV
Pesticides								
4,4-DDE	3.2E-03	3.2E-03	2.4E-12	1.5E-09	2.4E-12	1.5E-09	3.8E-09	1.5E-09
Polychlorinated Biphenyls								
Total PCBs	2.5E-01	1.4E-01	1.8E-10	2.1E-07	1.8E-10	2.1E-07	3.0E-07	2.1E-07
Total Petroleum Hydrocarbons								
TPH as diesel	8.4E+02	1.9E+02	6.2E-07	7.7E-02	6.2E-07	7.7E-02	9.9E-04	7.7E-02
TPH as motor oil	1.9E+03	5.8E+02	1.4E-06	NV	1.4E-06	NV	2.2E-03	NV

Table AOC9-4.2a
Baseline Scenario Depth-Weighted Exposure Point Concentrations and Predicted Outdoor Air Concentrations for Recreational Users:
C O P Cs in AOC 9 Surface Soil (0 to 0.5 foot bgs)

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

COPC	Exposure Point Concentration for Surface Soil: 0 to 0.5 foot bgs (mg/kg) [a]	Exposure Point Concentration for Subsurface II Soil: 0 to 10 feet bgs (mg/kg) [b]	Recreational User - Camper Outdoor Airborne Particulate Concentration (mg/m^3) [c]	Recreational User - Camper Outdoor Vapor Concentration (mg/m^3) [d]	Recreational User - Hiker Outdoor Airborne Particulate Concentration (mg/m^3) [c]	Recreational User - Hiker Outdoor Vapor Concentration (mg/m^3) [d]	Recreational User - Off Highway Vehicle Rider Outdoor Airborne Particulate Concentration (mg/m^3) [e]	Recreational User - Off Highway Vehicle Rider Outdoor Vapor Concentration (mg/m^3) [d]
Dioxins/Furans								
TEQ Human	1.0E-04	3.8E-04	7.5E-14	1.6E-10	7.5E-14	1.6E-10	1.2E-10	1.6E-10

Notes:

[a] Exposure point concentrations (EPCs) for surface soil (0 to 0.5 feet bgs) are used to evaluate inhalation of particulates in outdoor air.

[b] EPCs for subsurface II soil (0 to 10 feet bgs) are used to evaluate inhalation of volatiles in outdoor air.

[c] Outdoor airborne particulate concentration is calculated by dividing the soil EPCs by the particulate emission factor (PEF). Default PEF of 1.4×10^9 m^3/kg was used for recreational users (campers and hikers) as recommended by Department of Toxic Substances Control (2014).

[d] Chemical-specific volatilization factors (VFs) were estimated as discussed in Section 4.0, Exposure Assessment, of the main report. Outdoor vapor concentration is calculated by dividing the soil EPC by the VF.

[e] PEF of 8.5×10^5 m^3/kg was used for recreational users (off-highway vehicle rider) as calculated in United States Environmental Protection Agency (2008, 2009) and recommended in "Revised Technical Memorandum, Recreational Visitor Exposure Scenario for Federal Land, PG&E Topock Compressor Station Remediation Project, California," prepared by the Department of the Interior (DOI).

Abbreviations:

B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
C O P C = Constituent of Potential Concern.
mg/kg = milligrams per kilogram.
mg/m^3 = milligrams per cubic meter.
NA = not applicable.
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

References:

Department of Toxic Substances Control (DTSC). 2014. DTSC/HERO Human Health Risk Assessment (HHRA) Note Number 1: Recommended DTSC Default Exposure Factors for Use in Risk Assessment at California Hazardous Waste Sites and
United States Environmental Protection Agency (U S E P A). 2008. Clear Creek Management Areas Asbestos Exposure and Human Health Risk Assessment. Region 9. May. Available at:
U S E P A. 2009. Baseline Human Health Risk Assessment for the Standard Mine Site, Gunnison County, CO; Addendum. Prepared by SRC for U S E P A Region 8. November 24. Available at: http://www2.epa.gov/sites/production/files/documents/SM_H

Table AOC9-4.2b
Baseline Scenario Depth-Weighted Exposure Point Concentrations and Predicted Outdoor Air Concentrations for Recreational Users:
C O P Cs in AOC 9 Shallow Soil (0 to 3 feet bgs)

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Exposure Point Concentration for Shallow Soil: 0 to 3 feet bgs (mg/kg) [a]	Exposure Point Concentration for Subsurface II Soil: 0 to 10 feet bgs (mg/kg) [b]	Recreational User - Camper Outdoor Airborne Particulate Concentration (mg/m^3) [c]	Recreational User - Camper Outdoor Vapor Concentration (mg/m^3) [d]	Recreational User - Hiker Outdoor Airborne Particulate Concentration (mg/m^3) [c]	Recreational User - Hiker Outdoor Vapor Concentration (mg/m^3) [d]	Recreational User - Off Highway Vehicle Rider Outdoor Airborne Particulate Concentration (mg/m^3) [e]	Recreational User - Off Highway Vehicle Rider Outdoor Vapor Concentration (mg/m^3) [d]
Inorganics								
Antimony	1.0E+01	3.8E+00	7.6E-09	NV	7.6E-09	NV	1.2E-05	NV
Arsenic	5.3E+00	5.0E+00	3.9E-09	NV	3.9E-09	NV	6.3E-06	NV
Chromium, Hexavalent	1.7E+00	6.5E+01	1.2E-09	NV	1.2E-09	NV	2.0E-06	NV
Chromium, total	3.3E+01	6.1E+01	2.4E-08	NV	2.4E-08	NV	3.9E-05	NV
Copper	2.1E+01	1.1E+02	1.5E-08	NV	1.5E-08	NV	2.5E-05	NV
Lead	3.6E+01	3.1E+01	2.7E-08	NV	2.7E-08	NV	4.3E-05	NV
Mercury (inorganic)	3.1E+00	1.1E+00	2.3E-09	NV	2.3E-09	NV	3.7E-06	NV
Nickel	1.6E+01	1.6E+01	1.2E-08	NV	1.2E-08	NV	1.9E-05	NV
Thallium	1.5E+00	1.9E+00	1.1E-09	NV	1.1E-09	NV	1.8E-06	NV
Zinc	2.6E+02	2.3E+02	1.9E-07	NV	1.9E-07	NV	3.1E-04	NV
Volatile Organic Compounds								
Isophorone	2.9E+01	1.7E+01	2.1E-08	NV	2.1E-08	NV	3.4E-05	NV
Polycyclic Aromatic Hydrocarbons								
1-Methyl naphthalene	2.5E-02	2.9E-02	1.8E-11	4.0E-07	1.8E-11	4.0E-07	3.0E-08	4.0E-07
2-Methyl naphthalene	5.8E-03	3.0E-02	4.3E-12	4.0E-07	4.3E-12	4.0E-07	6.8E-09	4.0E-07
Acenaphthene	3.1E-03	3.4E-03	2.3E-12	1.9E-08	2.3E-12	1.9E-08	3.7E-09	1.9E-08
Acenaphthylene	1.8E-02	7.3E-03	1.3E-11	NV	1.3E-11	NV	2.1E-08	NV
Anthracene	1.4E-02	1.9E-02	9.9E-12	2.9E-08	9.9E-12	2.9E-08	1.6E-08	2.9E-08
Benzo (a) anthracene	2.2E-01	1.7E-01	1.6E-10	3.1E-08	1.6E-10	3.1E-08	2.6E-07	3.1E-08
Benzo (a) pyrene	5.2E-01	2.3E-01	3.8E-10	NV	3.8E-10	NV	6.2E-07	NV
Benzo (b) fluoranthene	1.5E+00	5.6E-01	1.1E-09	NV	1.1E-09	NV	1.8E-06	NV
Benzo (ghi) perylene	2.5E-01	2.1E-01	1.8E-10	NV	1.8E-10	NV	2.9E-07	NV
Benzo (k) fluoranthene	5.8E-01	2.1E-01	4.3E-10	NV	4.3E-10	NV	6.9E-07	NV
Chrysene	6.1E-01	2.7E-01	4.5E-10	NV	4.5E-10	NV	7.2E-07	NV
Dibenzo (a,h) anthracene	5.1E-02	5.0E-02	3.8E-11	NV	3.8E-11	NV	6.1E-08	NV
Fluoranthene	4.5E-01	3.5E-01	3.3E-10	NV	3.3E-10	NV	5.3E-07	NV
Fluorene	7.4E-03	4.8E-03	5.4E-12	1.3E-08	5.4E-12	1.3E-08	8.7E-09	1.3E-08
Indeno (1,2,3-cd) pyrene	9.2E-02	5.7E-02	6.8E-11	NV	6.8E-11	NV	1.1E-07	NV
Naphthalene	4.3E-03	4.7E-03	3.2E-12	8.0E-08	3.2E-12	8.0E-08	5.1E-09	8.0E-08
Phenanthrene	1.1E-01	9.2E-02	8.2E-11	NV	8.2E-11	NV	1.3E-07	NV
Pyrene	4.3E-01	3.2E-01	3.2E-10	1.0E-07	3.2E-10	1.0E-07	5.1E-07	1.0E-07
B(a)P Equivalent	9.2E-01	4.0E-01	6.8E-10	NV	6.8E-10	NV	1.1E-06	NV
Pesticides								
4,4-DDE	3.2E-03	3.2E-03	2.4E-12	1.5E-09	2.4E-12	1.5E-09	3.8E-09	1.5E-09
Polychlorinated Biphenyls	-	-	-	-	-	-	-	-
Total PCBs	2.2E-01	1.4E-01	1.6E-10	2.1E-07	1.6E-10	2.1E-07	2.6E-07	2.1E-07
Total Petroleum Hydrocarbons								
TPH as diesel	5.5E+02	1.9E+02	4.1E-07	7.7E-02	4.1E-07	7.7E-02	6.5E-04	7.7E-02
TPH as motor oil	1.3E+03	5.8E+02	9.3E-07	NV	9.3E-07	NV	1.5E-03	NV

Table AOC9-4.2b
Baseline Scenario Depth-Weighted Exposure Point Concentrations and Predicted Outdoor Air Concentrations for Recreational Users:
C O P Cs in AOC 9 Shallow Soil (0 to 3 feet bgs)

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Exposure Point Concentration for Shallow Soil: 0 to 3 feet bgs (mg/kg) [a]	Exposure Point Concentration for Subsurface II Soil: 0 to 10 feet bgs (mg/kg) [b]	Recreational User - Camper Outdoor Airborne Particulate Concentration (mg/m^3) [c]	Recreational User - Camper Outdoor Vapor Concentration (mg/m^3) [d]	Recreational User - Hiker Outdoor Airborne Particulate Concentration (mg/m^3) [c]	Recreational User - Hiker Outdoor Vapor Concentration (mg/m^3) [d]	Recreational User - Off Highway Vehicle Rider Outdoor Airborne Particulate Concentration (mg/m^3) [e]	Recreational User - Off Highway Vehicle Rider Outdoor Vapor Concentration (mg/m^3) [d]
Dioxins/Furans								
TEQ Human	7.3E-05	3.8E-04	5.4E-14	1.6E-10	5.4E-14	1.6E-10	8.7E-11	1.6E-10

Notes:

[a] Exposure point concentrations (EPCs) for shallow soil (0 to 3 feet bgs) are used to evaluate inhalation of particulates in outdoor air.

[b] EPCs for subsurface II soil (0 to 10 feet bgs) are used to evaluate inhalation of volatiles in outdoor air.

[c] Outdoor airborne particulate concentration is calculated by dividing the soil EPCs by the particulate emission factor (PEF). Default PEF of 1.4×10^9 m^3/kg was used for recreational users (campers and hikers) as recommended by Department of Toxic Substances Control (2014).

[d] Chemical-specific volatilization factors (VFs) were estimated as discussed in Section 4.0, Exposure Assessment, of the main report. Outdoor vapor concentration is calculated by dividing the soil EPC by the VF.

[e] PEF of 8.5×10^5 m^3/kg was used for recreational users (off-highway vehicle rider) as calculated in United States Environmental Protection Agency (2008, 2009) and recommended in "Revised Technical Memorandum, Recreational Visitor Exposure Scenario for Federal Land, PG&E Topock Compressor Station Remediation Project, California," prepared by the Department of the Interior (DOI).

Abbreviations:
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
C O P C = Constituent of Potential Concern.
mg/kg = milligrams per kilogram.
mg/m^3 = milligrams per cubic meter.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

References:

Department of Toxic Substances Control (DTSC). 2014. DTSC/HERO Human Health Risk Assessment (HHRA) Note Number 1: Recommended DTSC Default Exposure Factors for Use in Risk Assessment at California Hazardous Waste Sites and
United States Environmental Protection Agency (U S E P A). 2008. Clear Creek Management Areas Asbestos Exposure and Human Health Risk Assessment. Region 9. May. Available at:
U S E P A. 2009. Baseline Human Health Risk Assessment for the Standard Mine Site, Gunnison County, CO; Addendum. Prepared by SRC for U S E P A Region 8. November 24. Available at: http://www2.epa.gov/sites/production/files/documents/SM_H

Table AOC9-4.3a
Baseline Scenario Area-Weighted Exposure Point Concentrations and Predicted Outdoor Air Concentrations for Recreational Users:
C O P Cs in AOC 9 Surface Soil (0 to 0.5 foot bgs)

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PG&E Topock Compressor Station
Needles, California

COPC	Exposure Point Concentration for Surface Soil: 0 to 0.5 foot bgs (mg/kg) [a]	Exposure Point Concentration for Subsurface II Soil: 0 to 10 feet bgs (mg/kg) [b]	Recreational User - Camper Outdoor Airborne Particulate Concentration (mg/m^3) [c]	Recreational User - Camper Outdoor Vapor Concentration (mg/m^3) [d]	Recreational User - Hiker Outdoor Airborne Particulate Concentration (mg/m^3) [c]	Recreational User - Hiker Outdoor Vapor Concentration (mg/m^3) [d]	Recreational User - Off Highway Vehicle Rider Outdoor Airborne Particulate Concentration (mg/m^3) [e]	Recreational User - Off Highway Vehicle Rider Outdoor Vapor Concentration (mg/m^3) [d]
Inorganics								
Antimony	1.5E+01	3.8E+00	1.1E-08	NV	1.1E-08	NV	1.8E-05	NV
Arsenic	4.5E+00	4.2E+00	3.3E-09	NV	3.3E-09	NV	5.3E-06	NV
Chromium, Hexavalent	2.1E+00	5.7E+01	1.6E-09	NV	1.6E-09	NV	2.5E-06	NV
Chromium, total	4.6E+01	9.9E+01	3.4E-08	NV	3.4E-08	NV	5.4E-05	NV
Copper	4.4E+01	8.7E+01	3.2E-08	NV	3.2E-08	NV	5.1E-05	NV
Lead	8.5E+01	3.2E+01	6.2E-08	NV	6.2E-08	NV	1.0E-04	NV
Mercury (inorganic)	4.6E+00	5.8E-01	3.4E-09	NV	3.4E-09	NV	5.5E-06	NV
Nickel	1.7E+01	1.7E+01	1.2E-08	NV	1.2E-08	NV	2.0E-05	NV
Thallium	ND	1.9E+00	NA	NV	NA	NV	NA	NV
Zinc	1.3E+02	1.2E+02	9.3E-08	NV	9.3E-08	NV	1.5E-04	NV
Volatile Organic Compounds								
Isophorone	2.8E+00	1.7E+01	2.1E-09	NV	2.1E-09	NV	3.3E-06	NV
Polycyclic Aromatic Hydrocarbons								
1-Methyl naphthalene	1.6E-01	1.1E-02	1.2E-10	1.5E-07	1.2E-10	1.5E-07	1.9E-07	1.5E-07
2-Methyl naphthalene	1.2E-01	1.1E-02	8.8E-11	1.5E-07	8.8E-11	1.5E-07	1.4E-07	1.5E-07
Acenaphthene	8.5E-03	8.5E-03	6.3E-12	4.7E-08	6.3E-12	4.7E-08	1.0E-08	4.7E-08
Acenaphthylene	2.6E-02	7.3E-03	1.9E-11	NV	1.9E-11	NV	3.1E-08	NV
Anthracene	1.5E-02	2.1E-02	1.1E-11	3.2E-08	1.1E-11	3.2E-08	1.7E-08	3.2E-08
Benzo (a) anthracene	1.9E-01	1.4E-01	1.4E-10	2.6E-08	1.4E-10	2.6E-08	2.2E-07	2.6E-08
Benzo (a) pyrene	3.5E-01	1.2E-01	2.6E-10	NV	2.6E-10	NV	4.2E-07	NV
Benzo (b) fluoranthene	1.3E+00	3.0E-01	9.3E-10	NV	9.3E-10	NV	1.5E-06	NV
Benzo (ghi) perylene	1.8E-01	1.2E-01	1.3E-10	NV	1.3E-10	NV	2.2E-07	NV
Benzo (k) fluoranthene	4.9E-01	1.1E-01	3.6E-10	NV	3.6E-10	NV	5.8E-07	NV
Chrysene	4.3E-01	1.5E-01	3.1E-10	NV	3.1E-10	NV	5.0E-07	NV
Dibenzo (a,h) anthracene	1.6E-01	4.1E-02	1.2E-10	NV	1.2E-10	NV	1.9E-07	NV
Fluoranthene	2.7E-01	2.9E-01	2.0E-10	NV	2.0E-10	NV	3.2E-07	NV
Fluorene	9.8E-03	7.5E-03	7.2E-12	2.1E-08	7.2E-12	2.1E-08	1.2E-08	2.1E-08
Indeno (1,2,3-cd) pyrene	1.7E-01	9.5E-02	1.3E-10	NV	1.3E-10	NV	2.0E-07	NV
Naphthalene	1.6E-02	6.8E-03	1.2E-11	1.2E-07	1.2E-11	1.2E-07	1.9E-08	1.2E-07
Phenanthrene	9.6E-02	1.5E-01	7.1E-11	NV	7.1E-11	NV	1.1E-07	NV
Pyrene	2.7E-01	2.5E-01	1.9E-10	8.1E-08	1.9E-10	8.1E-08	3.1E-07	8.1E-08
B(a)P Equivalent	6.5E-01	2.1E-01	4.8E-10	NV	4.8E-10	NV	7.7E-07	NV
Pesticides								
4,4-DDE	3.2E-03	3.2E-03	2.4E-12	1.5E-09	2.4E-12	1.5E-09	3.8E-09	1.5E-09
Polychlorinated Biphenyls								
Total PCBs	3.0E-01	2.3E-01	2.2E-10	3.5E-07	2.2E-10	3.5E-07	3.5E-07	3.5E-07
Total Petroleum Hydrocarbons								
TPH as diesel	2.7E+02	1.1E+02	2.0E-07	4.3E-02	2.0E-07	4.3E-02	3.2E-04	4.3E-02
TPH as motor oil	6.2E+02	3.3E+02	4.6E-07	NV	4.6E-07	NV	7.3E-04	NV

Table AOC9-4.3a
Baseline Scenario Area-Weighted Exposure Point Concentrations and Predicted Outdoor Air Concentrations for Recreational Users:
C O P Cs in AOC 9 Surface Soil (0 to 0.5 foot bgs)

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
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Needles, California

COPC	Exposure Point Concentration for Surface Soil: 0 to 0.5 foot bgs (mg/kg) [a]	Exposure Point Concentration for Subsurface II Soil: 0 to 10 feet bgs (mg/kg) [b]	Recreational User - Camper Outdoor Airborne Particulate Concentration (mg/m^3) [c]	Recreational User - Camper Outdoor Vapor Concentration (mg/m^3) [d]	Recreational User - Hiker Outdoor Airborne Particulate Concentration (mg/m^3) [c]	Recreational User - Hiker Outdoor Vapor Concentration (mg/m^3) [d]	Recreational User - Off Highway Vehicle Rider Outdoor Airborne Particulate Concentration (mg/m^3) [e]	Recreational User - Off Highway Vehicle Rider Outdoor Vapor Concentration (mg/m^3) [d]
Dioxins/Furans								
TEQ Human	1.1E-04	1.8E-04	7.7E-14	7.4E-11	7.7E-14	7.4E-11	1.2E-10	7.4E-11

Notes:

[a] Exposure point concentrations (EPCs) for surface soil (0 to 0.5 feet bgs) are used to evaluate inhalation of particulates in outdoor air.

[b] EPCs for subsurface II soil (0 to 10 feet bgs) are used to evaluate inhalation of volatiles in outdoor air.

[c] Outdoor airborne particulate concentration is calculated by dividing the soil EPCs by the particulate emission factor (PEF). Default PEF of 1.4×10^9 m^3/kg was used for recreational users (campers and hikers) as recommended by Department of Toxic Substances Control (2014).

[d] Chemical-specific volatilization factors (VFs) were estimated as discussed in Section 4.0, Exposure Assessment, of the main report. Outdoor vapor concentration is calculated by dividing the soil EPC by the VF.

[e] PEF of 8.5×10^5 m^3/kg was used for recreational users (off-highway vehicle rider) as calculated in United States Environmental Protection Agency (2008, 2009) and recommended in "Revised Technical Memorandum, Recreational Visitor Exposure Scenario for Federal Land, PG&E Topock Compressor Station Remediation Project, California," prepared by the Department of the Interior (DOI).

Abbreviations:

B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
C O P C = Constituent of Potential Concern.
mg/kg = milligrams per kilogram.
mg/m^3 = milligrams per cubic meter.
NA = not applicable.
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

References:

Department of Toxic Substances Control (DTSC). 2014. DTSC/HERO Human Health Risk Assessment (HHRA) Note Number 1: Recommended DTSC Default Exposure Factors for Use in Risk Assessment at California Hazardous Waste Sites and
United States Environmental Protection Agency (U S E P A). 2008. Clear Creek Management Areas Asbestos Exposure and Human Health Risk Assessment. Region 9. May. Available at:
U S E P A. 2009. Baseline Human Health Risk Assessment for the Standard Mine Site, Gunnison County, CO; Addendum. Prepared by SRC for U S E P A Region 8. November 24. Available at: http://www2.epa.gov/sites/production/files/documents/SM_H

Table AOC9-4.3b
Baseline Scenario Area-Weighted Exposure Point Concentrations and Predicted Outdoor Air Concentrations for Recreational Users:
C O P Cs in AOC 9 Shallow Soil (0 to 3 feet bgs)

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C O P C	Exposure Point Concentration for Shallow Soil: 0 to 3 feet bgs (mg/kg) [a]	Exposure Point Concentration for Subsurface II Soil: 0 to 10 feet bgs (mg/kg) [b]	Recreational User - Camper Outdoor Airborne Particulate Concentration (mg/m^3) [c]	Recreational User - Camper Outdoor Vapor Concentration (mg/m^3) [d]	Recreational User - Hiker Outdoor Airborne Particulate Concentration (mg/m^3) [c]	Recreational User - Hiker Outdoor Vapor Concentration (mg/m^3) [d]	Recreational User - Off Highway Vehicle Rider Outdoor Airborne Particulate Concentration (mg/m^3) [e]	Recreational User - Off Highway Vehicle Rider Outdoor Vapor Concentration (mg/m^3) [d]
Inorganics								
Antimony	1.0E+01	3.8E+00	7.6E-09	NV	7.6E-09	NV	1.2E-05	NV
Arsenic	4.4E+00	4.2E+00	3.2E-09	NV	3.2E-09	NV	5.2E-06	NV
Chromium, Hexavalent	1.4E+00	5.7E+01	1.0E-09	NV	1.0E-09	NV	1.7E-06	NV
Chromium, total	3.6E+01	9.9E+01	2.6E-08	NV	2.6E-08	NV	4.2E-05	NV
Copper	3.5E+01	8.7E+01	2.6E-08	NV	2.6E-08	NV	4.1E-05	NV
Lead	5.5E+01	3.2E+01	4.0E-08	NV	4.0E-08	NV	6.5E-05	NV
Mercury (inorganic)	2.2E+00	5.8E-01	1.6E-09	NV	1.6E-09	NV	2.5E-06	NV
Nickel	1.6E+01	1.7E+01	1.2E-08	NV	1.2E-08	NV	1.9E-05	NV
Thallium	1.5E+00	1.9E+00	1.1E-09	NV	1.1E-09	NV	1.8E-06	NV
Zinc	1.2E+02	1.2E+02	9.0E-08	NV	9.0E-08	NV	1.5E-04	NV
Volatile Organic Compounds								
Isophorone	2.9E+01	1.7E+01	2.1E-08	NV	2.1E-08	NV	3.4E-05	NV
Polycyclic Aromatic Hydrocarbons								
1-Methyl naphthalene	1.4E-02	1.1E-02	1.0E-11	1.5E-07	1.0E-11	1.5E-07	1.7E-08	1.5E-07
2-Methyl naphthalene	1.3E-02	1.1E-02	9.6E-12	1.5E-07	9.6E-12	1.5E-07	1.5E-08	1.5E-07
Acenaphthene	8.9E-03	8.5E-03	6.5E-12	4.7E-08	6.5E-12	4.7E-08	1.1E-08	4.7E-08
Acenaphthylene	1.8E-02	7.3E-03	1.3E-11	NV	1.3E-11	NV	2.1E-08	NV
Anthracene	1.2E-02	2.1E-02	9.0E-12	3.2E-08	9.0E-12	3.2E-08	1.4E-08	3.2E-08
Benzo (a) anthracene	1.5E-01	1.4E-01	1.1E-10	2.6E-08	1.1E-10	2.6E-08	1.8E-07	2.6E-08
Benzo (a) pyrene	2.5E-01	1.2E-01	1.8E-10	NV	1.8E-10	NV	3.0E-07	NV
Benzo (b) fluoranthene	8.7E-01	3.0E-01	6.4E-10	NV	6.4E-10	NV	1.0E-06	NV
Benzo (ghi) perylene	1.5E-01	1.2E-01	1.1E-10	NV	1.1E-10	NV	1.8E-07	NV
Benzo (k) fluoranthene	3.3E-01	1.1E-01	2.4E-10	NV	2.4E-10	NV	3.9E-07	NV
Chrysene	3.0E-01	1.5E-01	2.2E-10	NV	2.2E-10	NV	3.5E-07	NV
Dibenzo (a,h) anthracene	1.1E-01	4.1E-02	8.1E-11	NV	8.1E-11	NV	1.3E-07	NV
Fluoranthene	2.4E-01	2.9E-01	1.8E-10	NV	1.8E-10	NV	2.8E-07	NV
Fluorene	7.4E-03	7.5E-03	5.4E-12	2.1E-08	5.4E-12	2.1E-08	8.7E-09	2.1E-08
Indeno (1,2,3-cd) pyrene	1.3E-01	9.5E-02	9.7E-11	NV	9.7E-11	NV	1.6E-07	NV
Naphthalene	9.2E-03	6.8E-03	6.8E-12	1.2E-07	6.8E-12	1.2E-07	1.1E-08	1.2E-07
Phenanthrene	7.6E-02	1.5E-01	5.6E-11	NV	5.6E-11	NV	8.9E-08	NV
Pyrene	2.2E-01	2.5E-01	1.6E-10	8.1E-08	1.6E-10	8.1E-08	2.6E-07	8.1E-08
B(a)P Equivalent	4.7E-01	2.1E-01	3.4E-10	NV	3.4E-10	NV	5.5E-07	NV
Pesticides								
4,4-DDE	3.2E-03	3.2E-03	2.4E-12	1.5E-09	2.4E-12	1.5E-09	3.8E-09	1.5E-09
Polychlorinated Biphenyls	-	-	-	-	-	-	-	-
Total PCBs	3.5E-01	2.3E-01	2.5E-10	3.5E-07	2.5E-10	3.5E-07	4.1E-07	3.5E-07
Total Petroleum Hydrocarbons								
TPH as diesel	2.1E+02	1.1E+02	1.6E-07	4.3E-02	1.6E-07	4.3E-02	2.5E-04	4.3E-02
TPH as motor oil	5.1E+02	3.3E+02	3.8E-07	NV	3.8E-07	NV	6.1E-04	NV

Table AOC9-4.3b
Baseline Scenario Area-Weighted Exposure Point Concentrations and Predicted Outdoor Air Concentrations for Recreational Users:
C O P Cs in AOC 9 Shallow Soil (0 to 3 feet bgs)

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C O P C	Exposure Point Concentration for Shallow Soil: 0 to 3 feet bgs (mg/kg) [a]	Exposure Point Concentration for Subsurface II Soil: 0 to 10 feet bgs (mg/kg) [b]	Recreational User - Camper Outdoor Airborne Particulate Concentration (mg/m^3) [c]	Recreational User - Camper Outdoor Vapor Concentration (mg/m^3) [d]	Recreational User - Hiker Outdoor Airborne Particulate Concentration (mg/m^3) [c]	Recreational User - Hiker Outdoor Vapor Concentration (mg/m^3) [d]	Recreational User - Off Highway Vehicle Rider Outdoor Airborne Particulate Concentration (mg/m^3) [e]	Recreational User - Off Highway Vehicle Rider Outdoor Vapor Concentration (mg/m^3) [d]
Dioxins/Furans								
TEQ Human	7.0E-05	1.8E-04	5.2E-14	7.4E-11	5.2E-14	7.4E-11	8.3E-11	7.4E-11

Notes:

[a] Exposure point concentrations (EPCs) for shallow soil (0 to 3 feet bgs) are used to evaluate inhalation of particulates in outdoor air.

[b] EPCs for subsurface II soil (0 to 10 feet bgs) are used to evaluate inhalation of volatiles in outdoor air.

[c] Outdoor airborne particulate concentration is calculated by dividing the soil EPCs by the particulate emission factor (PEF). Default PEF of 1.4×10^9 m^3/kg was used for recreational users (campers and hikers) as recommended by Department of Toxic Substances Control (2014).

[d] Chemical-specific volatilization factors (VFs) were estimated as discussed in Section 4.0, Exposure Assessment, of the main report. Outdoor vapor concentration is calculated by dividing the soil EPC by the VF.

[e] PEF of 8.5×10^5 m^3/kg was used for recreational users (off-highway vehicle rider) as calculated in United States Environmental Protection Agency (2008, 2009) and recommended in "Revised Technical Memorandum, Recreational Visitor Exposure Scenario for Federal Land, PG&E Topock Compressor Station Remediation Project, California," prepared by the Department of the Interior (DOI).

Abbreviations:
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
C O P C = Constituent of Potential Concern.
mg/kg = milligrams per kilogram.
mg/m^3 = milligrams per cubic meter.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

References:

Department of Toxic Substances Control (DTSC). 2014. DTSC/HERO Human Health Risk Assessment (HHRA) Note Number 1: Recommended DTSC Default Exposure Factors for Use in Risk Assessment at California Hazardous Waste Sites and
United States Environmental Protection Agency (U S E P A). 2008. Clear Creek Management Areas Asbestos Exposure and Human Health Risk Assessment. Region 9. May. Available at:
U S E P A. 2009. Baseline Human Health Risk Assessment for the Standard Mine Site, Gunnison County, CO; Addendum. Prepared by SRC for U S E P A Region 8. November 24. Available at: http://www2.epa.gov/sites/production/files/documents/SM_H

Table AOC9-4.4

Human Health Risk and Hazard Estimate Summary at AOC 9 for the Baseline Scenario Using Depth-Weighted Exposure Point Concentrations

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

Receptor	Depth Interval	ILCR	HI
Recreational User - Camper	Surface	3E-06	6E-01
Recreational User - Camper	Shallow	3E-06	6E-01
Recreational User - Hiker	Surface	6E-06	1E+00
Recreational User - Hiker	Shallow	5E-06	1E+00
Recreational User - OHV Rider	Surface	4E-06	3E-01
Recreational User - OHV Rider	Shallow	3E-06	3E-01

Abbreviations:
ILCR = Incremental Lifetime Cancer Risk
H I = Hazard Index

Table AOC9-4.5
Human Health Risk and Hazard Estimate Summary at AOC 9 for the Baseline Scenario Using Area-Weighted Exposure Point Concentrations

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

Receptor	Depth Interval	ILCR	HI
Recreational User - Camper	Surface	2E-06	5E-01
Recreational User - Camper	Shallow	2E-06	5E-01
Recreational User - Hiker	Surface	5E-06	1E+00
Recreational User - Hiker	Shallow	4E-06	1E+00
Recreational User - OHV Rider	Surface	3E-06	2E-01
Recreational User - OHV Rider	Shallow	3E-06	2E-01

Abbreviations:
ILCR = Incremental Lifetime Cancer Risk
H I = Hazard Index

Table AOC9-5.1
Depth-Weighted Exposure Point Concentrations for Soil and Biota for AOC 9

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

Category	C O P E C	Units	Soil EPC (0-0.5 ft bgs)	Biota EPC (0-0.5 ft bgs) [a]
Inorganics	Chromium, hexavalent	mg/kg	3.20E+00	9.78E-01
Inorganics	Chromium, total	mg/kg	3.78E+01	1.16E+01
Inorganics	Copper	mg/kg	3.92E+01	2.02E+01
Dioxins	TEQ Mammals	ng/kg	1.03E+02	6.60E+02

Notes:
[a] Calculated using selected soil EPC and uptake model. See Section 6 of the main report.

Abbreviations:
C O P E C = constituent of potential ecological concern
EPC = exposure point concentration
ft bgs = feet below ground surface
mg/kg = milligrams per kilogram
ng/kg = nanograms per kilogram
TEQ = toxicity equivalent

Table AOC9-5.2
Area-Weighted Exposure Point Concentrations for Soil and Biota for AOC 9

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

Category	C O P E C	Units	Soil EPC (0-0.5 ft bgs)	Biota EPC (0-0.5 ft bgs) [a]
Inorganics	Chromium, hexavalent	mg/kg	2.14E+00	6.55E-01
Inorganics	Chromium, total	mg/kg	4.61E+01	1.41E+01
Inorganics	Copper	mg/kg	4.36E+01	2.25E+01
Dioxins	TEQ Mammals	ng/kg	1.05E+02	6.80E+02

Notes:
[a] Calculated using selected soil EPC and uptake model. See Section 6 of the main report.

Abbreviations:
C O P E C = constituent of potential ecological concern
EPC = exposure point concentration
ft bgs = feet below ground surface
mg/kg = milligrams per kilogram
ng/kg = nanograms per kilogram
TEQ = toxicity equivalent

Table AOC9-5.3
Toxic Equivalency Factors for Dioxin Congeners and Calculated Tissue Exposure Point Concentrations for Dioxin TEQ for AOC 9

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

Constituent	Units	Soil EPC 95% UCL (0-0.5 ft bgs)	Terrestrial Invertebrate Bioaccumulation Factors	Terrestrial Invertebrate Tissue EPC (0-0.5 ft bgs)	Mammal TEFs[a]	Terrestrial Invertebrate Tissue EPCs (0-0.5 ft bgs, Mammal TEF Applied)
Congener-Specific Approach (USEPA 1999)						
1,2,3,4,6,7,8-hpcdd	ng/kg	4045	0.081	328	0.01	3.28
1,2,3,4,6,7,8-hpcdf	ng/kg	281.4	0.017	4.78	0.01	0.048
1,2,3,4,7,8,9-hpcdf	ng/kg	13.06	0.62	8.10	0.01	0.081
1,2,3,4,7,8-hxcdd	ng/kg	90.79	0.49	44.49	0.1	4.45
1,2,3,4,7,8-hxcdf	ng/kg	11.54	0.121	1.40	0.1	0.140
1,2,3,6,7,8-hxcdd	ng/kg	80.19	0.19	15.24	0.1	1.52
1,2,3,6,7,8-hxcdf	ng/kg	7.102	0.3	2.13	0.1	0.21
1,2,3,7,8,9-hxcdd	ng/kg	31.1	0.22	6.84	0.1	0.68
1,2,3,7,8,9-hxcdf	ng/kg	5.5	1	5.50	0.1	0.55
1,2,3,7,8-pecdd	ng/kg	17	1.46	24.82	1	24.82
1,2,3,7,8-pecdf	ng/kg	11.32	0.32	3.62	0.03	0.109
2,3,4,6,7,8-hxcdf	ng/kg	0.56	1.07	0.60	0.1	0.06
2,3,4,7,8-pecdf	ng/kg	3.93	2.54	9.98	0.3	2.99
2,3,7,8-tcdd	ng/kg	0.6	1.59	0.95	1	0.95
2,3,7,8-tcdf	ng/kg	13.58	1.27	17.25	0.1	1.72
ocdd	ng/kg	27222	0.019	517	0.0003	0.155
ocdf	ng/kg	613.6	0.025	15.3	0.0003	0.0046
Dioxin TEQ	ng/kg					**41.8**
Congener-Specific Approach (Fagervold et al. 2010)[b]						
1,2,3,4,6,7,8-hpcdd	ng/kg	4045	0.20	800.57	0.01	8.01
1,2,3,4,6,7,8-hpcdf	ng/kg	281.4	0.36	99.99	0.01	1.00
1,2,3,4,7,8,9-hpcdf	ng/kg	13.06	0.34	4.41	0.01	0.044
1,2,3,4,7,8-hxcdd	ng/kg	90.79	0.23	20.81	0.1	2.08
1,2,3,4,7,8-hxcdf	ng/kg	11.54	0.48	5.49	0.1	0.55
1,2,3,6,7,8-hxcdd	ng/kg	80.19	0.19	15.44	0.1	1.54
1,2,3,6,7,8-hxcdf	ng/kg	7.102	0.59	4.16	0.1	0.42
1,2,3,7,8,9-hxcdd	ng/kg	31.1	0.13	3.99	0.1	0.40
1,2,3,7,8,9-hxcdf	ng/kg	5.5	1.22	6.72	0.1	0.67
1,2,3,7,8-pecdd	ng/kg	17	0.18	3.12	1	3.12
1,2,3,7,8-pecdf	ng/kg	11.32	0.79	8.90	0.03	0.267
2,3,4,6,7,8-hxcdf	ng/kg	0.56	0.33	0.19	0.1	0.02
2,3,4,7,8-pecdf	ng/kg	3.93	0.56	2.22	0.3	0.67
2,3,7,8-tcdd	ng/kg	0.6	1.65	0.99	1	0.99
2,3,7,8-tcdf	ng/kg	13.58	1.21	16.41	0.1	1.64
ocdd	ng/kg	27222	0.25	6871.29	0.0003	2.06
ocdf	ng/kg	613.6	0.27	168.18	0.0003	0.050
Dioxin TEQ	ng/kg	102.6				**23.5**

Table AOC9-5.3
Toxic Equivalency Factors for Dioxin Congeners and Calculated Tissue Exposure Point Concentrations for Dioxin TEQ for AOC 9

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

Constituent	Units	Soil EPC 95% UCL (0-0.5 ft bgs)	Terrestrial Invertebrate Bioaccumulation Factors	Terrestrial Invertebrate Tissue EPC (0-0.5 ft bgs)	Mammal TEFs[a]	Terrestrial Invertebrate Tissue EPCs (0-0.5 ft bgs, Mammal TEF Applied)
ERA Approach[c]						
TEQ mammals	ng/kg	102.6	ln(Ci) = 1.182 * ln(Cs) + 3.533	--	--	**660**

Notes:
[a] Toxic Equivalentcy Factors (TEFs) from Van den Berg (2006) for mammals.
[b] Fagervold et al. (2010) bioaccumulation factors calculated using soil-to-earthworm 2,3,7,8-TCDD BAF for soil at location SW-20 (BAF = 1.65) and congener-specific earthworm bioaccumulation equivalency factors. See Table 6-34 of the 2019 H H E R A (Arcadis 2019).
[c] ERA approach bioaccumulation factor based on tetrachlorodibenzo-p-dioxin (TCDD) in Sample et al. (1998).

Abbreviations:
C O P E C = constituent of potential ecological concern
EPC = exposure point concentration
ft bgs = feet below ground surface
ng/kg = nanograms per kilogram
TEQ = toxicity equivalent
TEF = toxic equivalency factor

References:
Arcadis. 2019. Final Soil Human Health and Ecological Risk Assessment Report, Topock Compressor Station, Needles, California.
Fagervold, SK, Y Chai, JW Davis, M Wilken, G Cornelissen, and U Ghosh. 2010. Bioaccumulation of polychlorinated dibenzo-p-dioxins/dibenzofurans in E. fetida from floodplain soils and the effect of activated carbon amendment. Environ Sci Technol. 44(14):5546-52.
Sample, B.E., J.J. Beauchamp, R.A. Efroymson, G.W. Suter, II, and T.L. Ashwood. 1998. Development and Validation of Bioaccumulation Models for Earthworms. ES/ER/TM-220. Oak Ridge National Laboratory, Oak Ridge TN. 93 pp.47
USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities. U.S. Environmental Protection Agency Peer Review Draft. August
Van den Berg, et al. 1998. Toxic equivalency factors (TEFs) for PCBs, PCDDs, PCDFs for humans and wildlife. Environ Health Perspect 106(12):775-792.
Van den Berg, et al. 2006. The 2005 World Health Organization reevaluation of human and mammalian TEFs for dioxins and dioxin-like compounds. Toxicological Sciences 93:223-241.

Table AOC9-5.4

Desert Shrew Risk Estimate Summary Using Depth-Weighted Exposure Point Concentrations (Wildlife SUF = 1, TRVs used for RBRG Development, and Selected BAFs) for AOC 9

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

Scenario	Category	C O P E C	Desert Shrew N O A E L HQ TRV Used for RBRG Development SUF = 1	N O A E L HQ TRV Basis[a]	N O A E L HQ Notes	Desert Shrew L O A E L HQ TRV Used for RBRG Development SUF = 1	L O A E L HQ TRV Basis[a]	L O A E L HQ Notes
Baseline	Inorganics	Chromium, hexavalent	2E-02	Selected TRV	None	6E-03	Selected TRV	None
Baseline	Inorganics	Chromium, total	1E+00	Selected TRV	None	3E-01	Selected TRV	None
Baseline	Inorganics	Copper	5E-01	Selected TRV	None	3E-01	Selected TRV	None
Baseline	Dioxins	TEQ Mammals	**3E+01**	Alternate TRV	Note 1	**4E+00**	Alternate TRV	Note 2

Notes:

[a] Selected TRVs for metals are based on the TRVs used to develop the U S E P A Ecological Soil Screening Levels (U S E P A 2005). Alternate TRVs for dioxin TEQ were developed for mammals based the geometric mean of the reproduction and growth endpoints for the NOAEL and LOAEL effect levels, respectively.

Note 1	N O A E L HQ greater than 1
Note 2	L O A E L HQ greater than 1
Note 3	L O A E L HQ greater than 10
Note 4	L O A E L HQ greater than 100

Abbreviations:

BAF = bioaccumulation factor
C O P E C = constituent of potential ecological concern
HQ = hazard quotient
LOAEL = lowest observed adverse effect level
NOAEL = no-observed adverse effect level
RBRG = risk-based remedial goal
S U F = site use factor
TEQ = toxicity equivalent
TRV = toxicity reference value
U S E P A = United States Environmental Protection Agency

Table AOC9-5.5
Desert Shrew Risk Estimate Summary Using Area-Weighted Exposure Point Concentrations (Wildlife SUF = 1, TRVs used for RBRG Development, and Selected BAFs) for AOC 9

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

Scenario	Category	C O P E C	Desert Shrew N O A E L HQ TRV Used for RBRG Development SUF = 1	N O A E L HQ TRV Basis[a]	N O A E L HQ Notes	Desert Shrew L O A E L HQ TRV Used for RBRG Development SUF = 1	L O A E L HQ TRV Basis[a]	L O A E L HQ Notes
Baseline	Inorganics	Chromium, hexavalent	2E-02	Selected TRV	None	4E-03	Selected TRV	None
Baseline	Inorganics	Chromium, total	1E+00	Selected TRV	None	3E-01	Selected TRV	None
Baseline	Inorganics	Copper	5E-01	Selected TRV	None	3E-01	Selected TRV	None
Baseline	Dioxins	TEQ Mammals	**3E+01**	Alternate TRV	Note 1	**5E+00**	Alternate TRV	Note 2

Notes:
[a] Selected TRVs for metals are based on the TRVs used to develop the U S E P A Ecological Soil Screening Levels (U S E P A 2005). Alternate TRVs for dioxin TEQ were de for mammals based the geometric mean of the reproduction and growth endpoints for the NOAEL and LOAEL effect levels, respectively.

Note 1	N O A E L HQ greater than 1
Note 2	L O A E L HQ greater than 1
Note 3	L O A E L HQ greater than 10
Note 4	L O A E L HQ greater than 100

Abbreviations:
BAF = bioaccumulation factor
C O P E C = constituent of potential ecological concern
HQ = hazard quotient
LOAEL = lowest observed adverse effect level
NOAEL = no-observed adverse effect level
RBRG = risk-based remedial goal
S U F = site use factor
TEQ = toxicity equivalent
TRV = toxicity reference value
U S E P A = United States Environmental Protection Agency

Table AOC9-5.6
Desert Shrew Risk Estimate Summary Using Depth-Weighted Exposure Point Concentrations (Wildlife SUF = 1, TRVs used for RBRG Development, and Alternate BAFs) for AOC 9

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

Scenario	Category	BAF Type	C O P E C	Desert Shrew N O A E L HQ TRV Used for RBRG Development SUF = 1	N O A E L HQ TRV Basis[a]	N O A E L HQ Notes	Desert Shrew L O A E L HQ TRV Used for RBRG Development SUF = 1	L O A E L HQ TRV Basis[a]	L O A E L HQ Notes
Baseline	Dioxins	Congener-Specific (USEPA 1999)	TEQ Mammals	**2E+00**	Alternate TRV	Note 1	3E-01	Alternate TRV	None
Baseline	Dioxins	Congener-Specific (Fagervold et al. 2010)	TEQ Mammals	1E+00	Alternate TRV	None	2E-01	Alternate TRV	None

Notes:

Note 1	N O A E L HQ greater than 1
Note 2	L O A E L HQ greater than 1
Note 3	L O A E L HQ greater than 10
Note 4	L O A E L HQ greater than 100

Abbreviations:
BAF = bioaccumulation factor
C O P E C = constituent of potential ecological concern
HQ = hazard quotient
LOAEL = lowest observed adverse effect level
NOAEL = no-observed adverse effect level
RBRG = risk-based remedial goal
S U F = site use factor
TEQ = toxicity equivalent
TRV = toxicity reference value
U S E P A = United States Environmental Protection Agency

Table AOC9-6.1
Desert Shrew Risk Estimate Summary Using Depth-Weighted and Area-Weighted Exposure Point Concentrations for AOC 9

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

Scenario	Category	C O P E C	BAF Type	Desert Shrew Depth-Weighted N O A E L HQ TRV Used for RBRG Development SUF = 1	Desert Shrew Depth-Weighted N O A E L HQ Notes	Desert Shrew Depth-Weighted L O A E L HQ TRV Used for RBRG Development SUF = 1	Desert Shrew Depth-Weighted L O A E L HQ Notes	Desert Shrew Area-Weighted N O A E L HQ TRV Used for RBRG Development SUF = 1	Desert Shrew Area-Weighted N O A E L HQ Notes	Desert Shrew Area-Weighted L O A E L HQ TRV Used for RBRG Development SUF = 1	Desert Shrew Area-Weighted L O A E L HQ Notes	W O E Result[a]
Baseline	Inorganics	Chromium, hexavalent	Selected BAF	2E-02	None	6E-03	None	2E-02	None	4E-03	None	HQ less than or equal to 1
Baseline	Inorganics	Chromium, total	Selected BAF	1E+00	None	3E-01	None	1E+00	None	3E-01	None	HQ less than or equal to 1
Baseline	Inorganics	Copper	Selected BAF	5E-01	None	3E-01	None	5E-01	None	3E-01	None	HQ less than or equal to 1
Baseline	Dioxins	TEQ Mammals	Selected BAF	**3E+01**	Note 1	**4E+00**	Note 2	**3E+01**	Note 1	**5E+00**	Note 2	See W O E for Alternate BAFs
Baseline	Dioxins	TEQ Mammals	Alternate BAF (USEPA 1999)	**2E+00**	Note 1	3E-01	None	--	None	--	None	HQ less than or equal to 1
Baseline	Dioxins	TEQ Mammals	Alternate BAF (Fagervold et al. 2010)	1E+00	None	2E-01	None	--	None	--	None	HQ less than or equal to 1

Notes:
[a] W O E result for dioxin TEQ is risk conclusion based on 1) L O A E L HQ based on depth-weighted EPCs and assumptions used for RBRG development (i.e., a SUF of 1, congener-specific BAFs, and alternate TRVs), and 2) supporting L O E s. W O E result for metals is risk conclusion based on 1) L O A E L HQ based on area-weighted EPCs and assumptions used for RBRG development (i.e., a SUF of 1 and selected BAFs and TRVs), and 2) supporting L O E s.

Note 1	N O A E L HQ greater than 1
Note 2	L O A E L HQ greater than 1
Note 3	L O A E L HQ greater than 10
Note 4	L O A E L HQ greater than 100

Abbreviations:
"--" = not applicable
B A F = bioaccumulation factor
C O P E C = constituent of potential ecological concern
E P C = exposure point concentration
H Q = hazard quotient
L O A E L = lowest observed adverse effect level
L O E = line of evidence
N O A E L = no-observed adverse effect level
R B R G = risk-based remedial goal
S U F = site use factor
T E Q = toxicity equivalent
T R V = toxicity reference value
U S E P A = United States Environmental Protection Agency
W O E = weight of evidence, considering multiple L O E s. If HQs/L O A E L HQs are greater than 1, W O E Result is either 1) not expected, 2) unlikely, or 3) possible.

FIGURES

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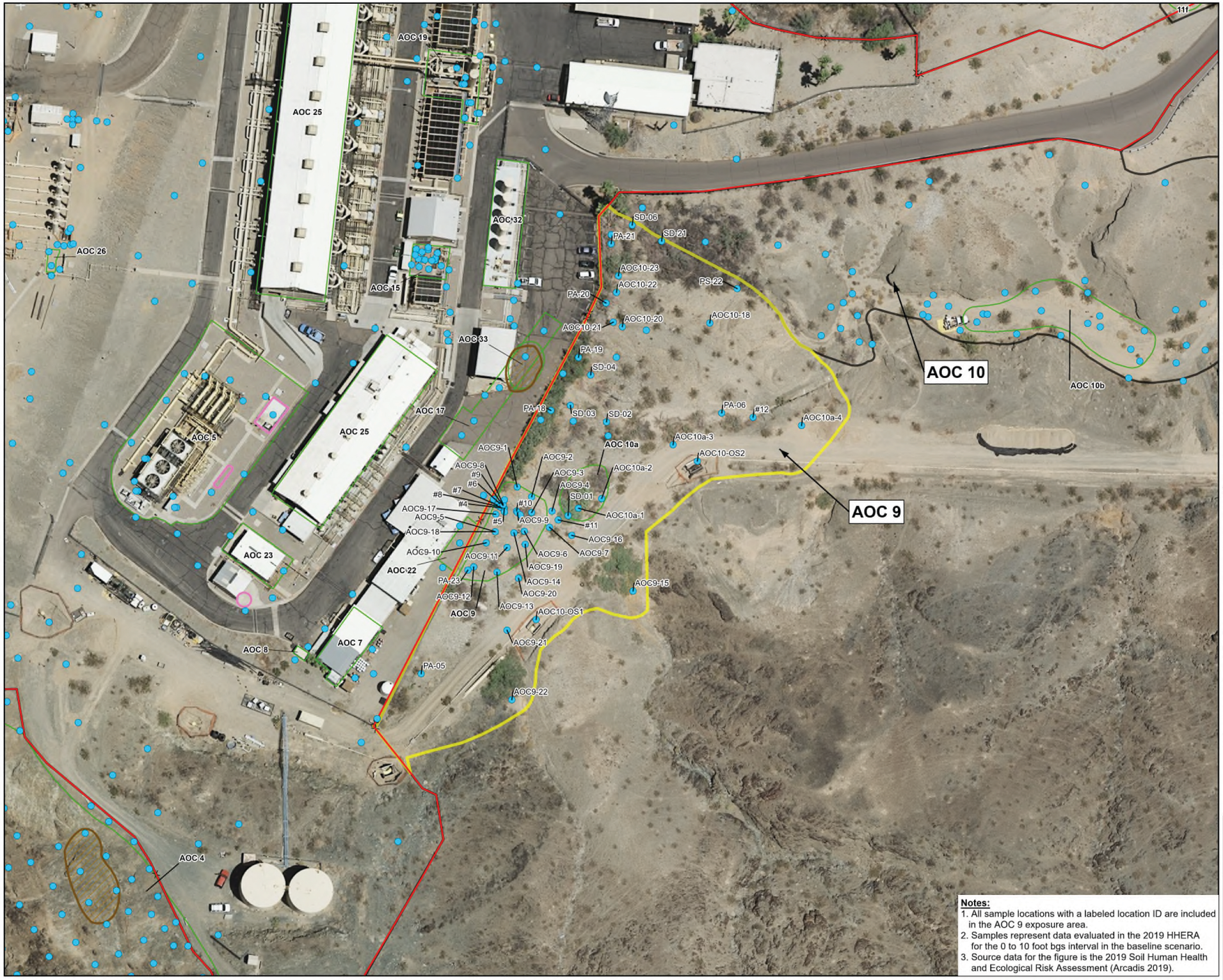

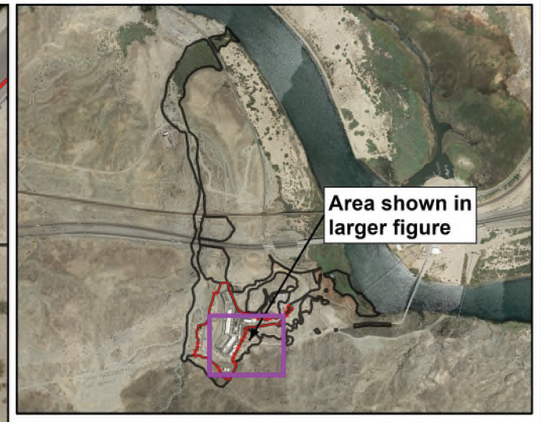

Legend:

- Soil Sampling Location
- Area of Concern
- Solid Waste Management Unit
- Potential Burning Related Location
- AOC 9 Exposure Area
- Exposure Area
- Property Boundaries
- Fencing
- Inside the Topock Compressor Station boundary, as defined by current fenceline
- **AOC 10** Label for Exposure Area
- **AOC 10** Label for Area of Concern

0 80 160

SCALE IN FEET

Notes:

1. All sample locations with a labeled location ID are included in the AOC 9 exposure area.
2. Samples represent data evaluated in the 2019 HHERA for the 0 to 10 foot bgs interval in the baseline scenario.
3. Source data for the figure is the 2019 Soil Human Health and Ecological Risk Assessment (Arcadis 2019).

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

POST-SOIL NTCRA HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT REPORT

SOIL SAMPLING LOCATIONS
AOC 9 EXPOSURE AREA (PRE-NTCRA)

ARCADIS

FIGURE
AOC9-1.1

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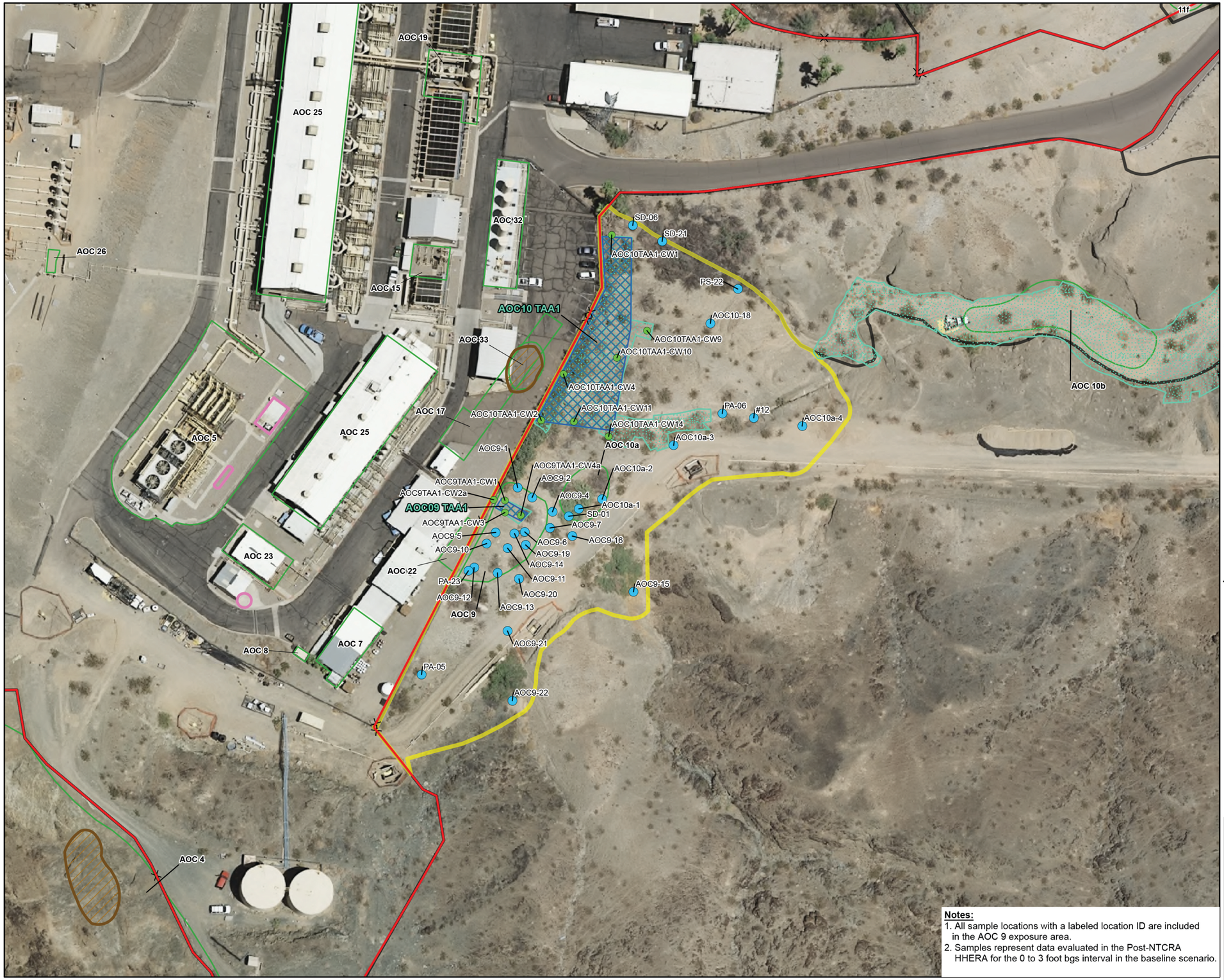
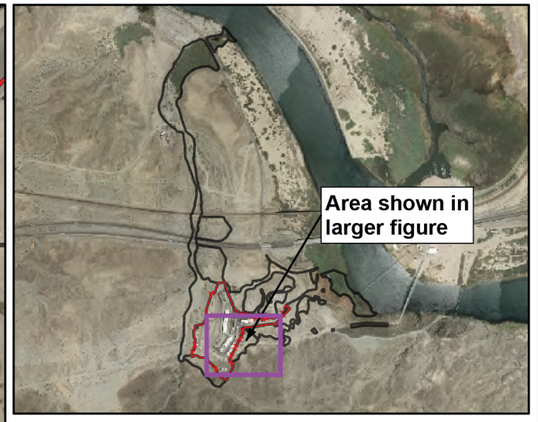




Legend:

- Soil Sampling Location
- NTCRA Confirmation Samples
- Area of Concern
- Solid Waste Management Unit
- Potential Burning Related Location
- AOC 9 Exposure Area
- Target Action Area
- NTCRA Removal Area
- Exposure Area
- Property Boundaries
- Fencing
- Inside the Topock Compressor Station boundary, as defined by current fenceline

AOC 10 Label for Exposure Area

AOC 10 Label for Area of Concern

AOC10 TAA1 Target Action Area (TAA)

0 80 160

SCALE IN FEET

Notes:

1. All sample locations with a labeled location ID are included in the AOC 9 exposure area.
2. Samples represent data evaluated in the Post-NTCRA HHERA for the 0 to 3 foot bgs interval in the baseline scenario.

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

POST-SOIL NTCRA HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT REPORT

CURRENT SOIL SAMPLING LOCATIONS AND NTCRA AREAS FOR AOC 9 EXPOSURE AREA

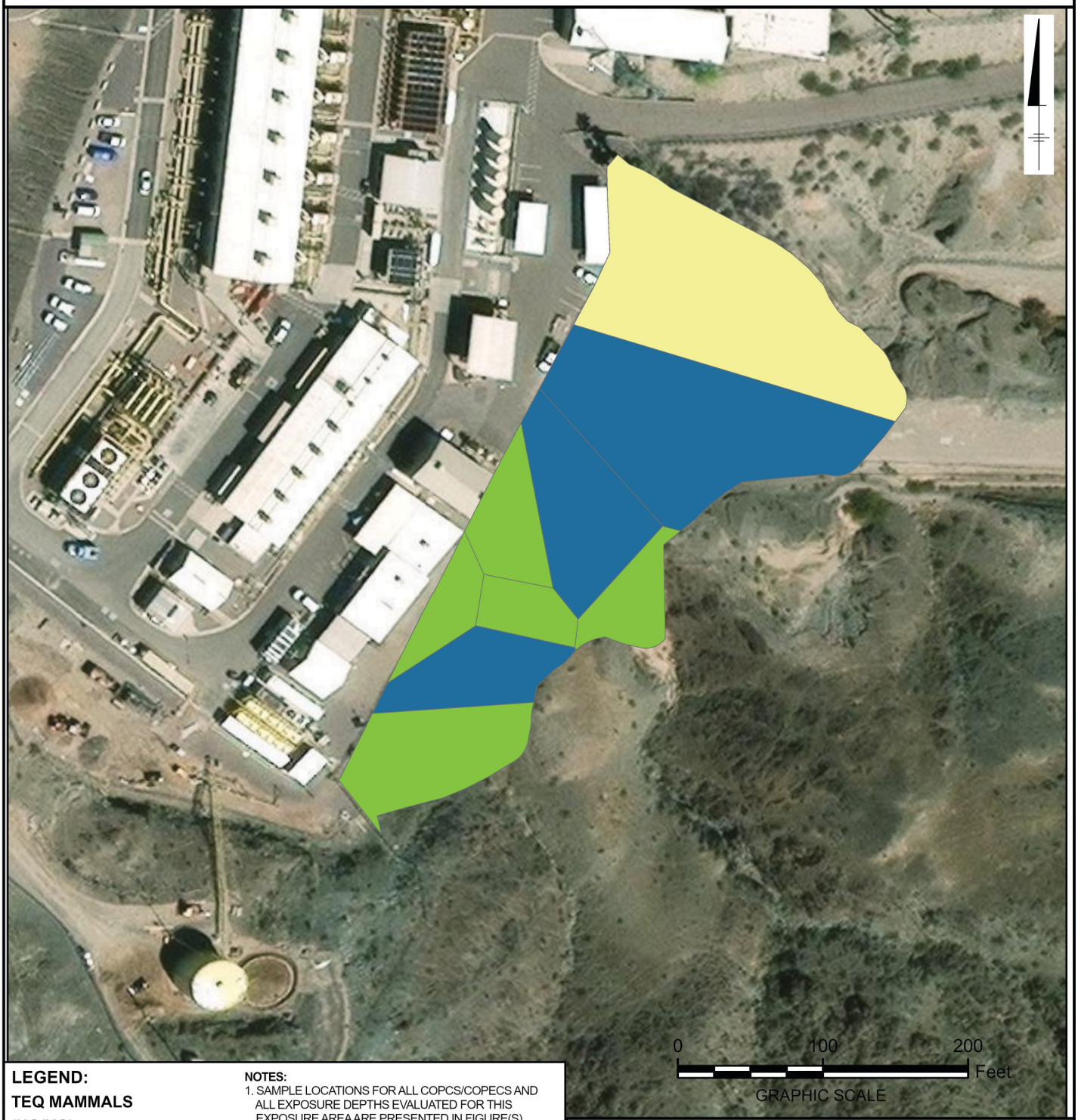
ARCADIS

FIGURE
AOC9-1.2

ATTACHMENT A

Dataset and Exposure Point Concentration Calculations for the AOC 9 HHERA

AOC 9
0 - 0.5 FEET BELOW GROUND SURFACE
TEQ MAMMALS



LEGEND:

TEQ MAMMALS (NG/KG)

- 0 - 5.58
- >5.58 - 100
- >100 - 190
- >190

NOTES:

1. SAMPLE LOCATIONS FOR ALL COPCS/COPECS AND ALL EXPOSURE DEPTHS EVALUATED FOR THIS EXPOSURE AREA ARE PRESENTED IN FIGURE(S) AOC9-1.2.
2. DEPTH-WEIGHTED CONCENTRATIONS ARE DISPLAYED FOR EACH LOCATION.
3. SOIL REMOVAL ACTION GOALS AS SELECTED IN THE SOIL ENGINEERING EVALUATION/COST ANALYSIS (JACOBS 2021).
4. NG/KG = NANOGRAMS PER KILOGRAM
5. RBRG = RISK-BASED REMEDIAL GOAL

TEQ Mammals	Units	Value	Basis
Background	ng/kg	5.58	Site-specific Soil Background Value
Human Health RBRG	ng/kg	100	Soil Removal Action Goal (Hiker at 10-6 excess risk)
Ecological RBRG	ng/kg	190	Soil Removal Action Goal (Desert shrew)
Human Health RBRG	ng/kg	1000	Hiker at 10-5 excess risk

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

POST-NTCRA HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

THIESSEN POLYGONS FOR AREA WEIGHTING

ARCADIS

FIGURE
AOC9-A3.1

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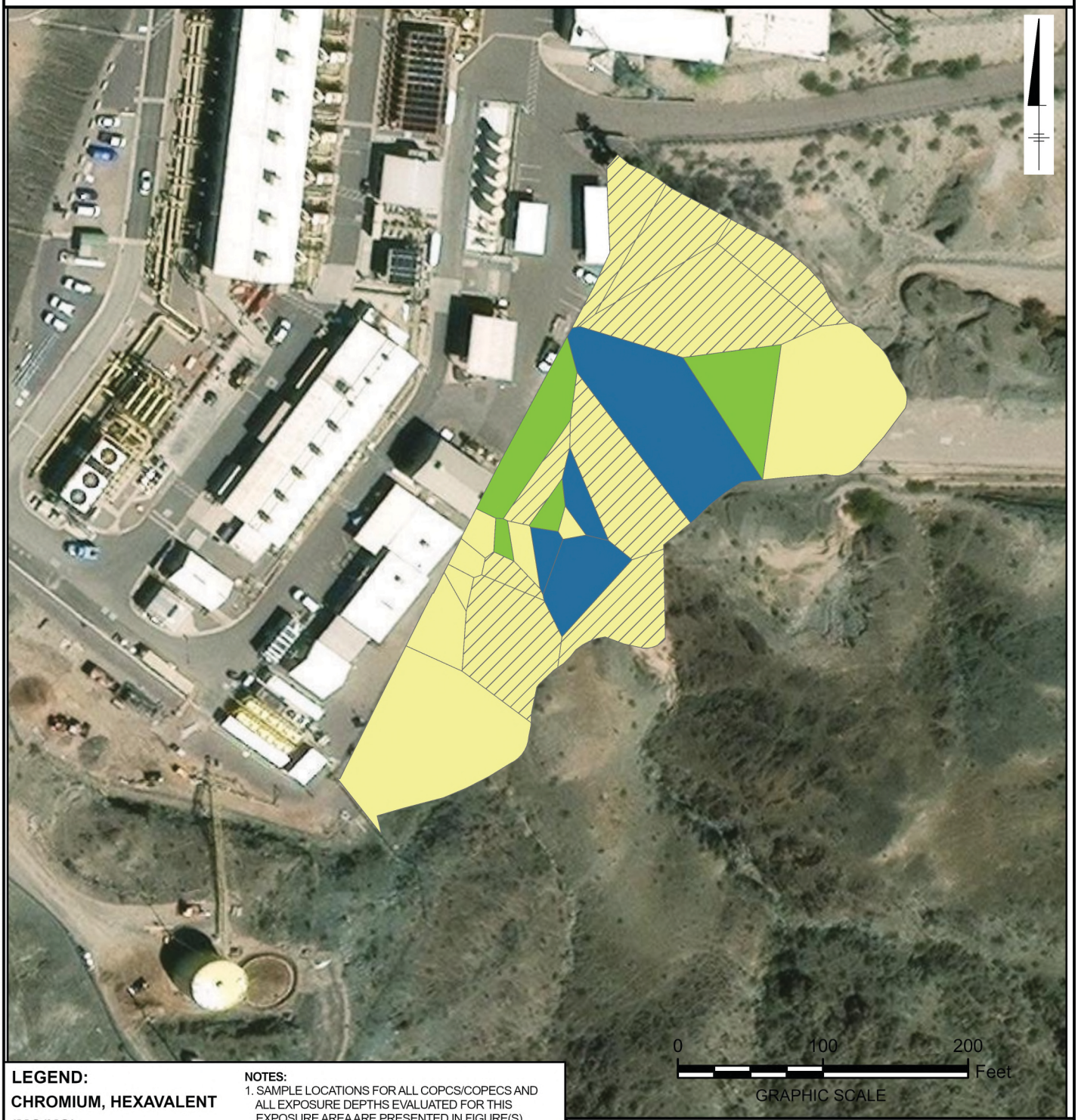
AOC 9
0 - 0.5 FEET BELOW GROUND SURFACE
CHROMIUM, HEXAVALENT



LEGEND:

CHROMIUM, HEXAVALENT (MG/KG)

- 0 - 0.83
- >0.83 - 3.1
- >3.1 - 31
- >31
- NOT DETECTED

NOTES:

1. SAMPLE LOCATIONS FOR ALL COPCS/COPECS AND ALL EXPOSURE DEPTHS EVALUATED FOR THIS EXPOSURE AREA ARE PRESENTED IN FIGURE(S) AOC9-1.2.
2. DEPTH-WEIGHTED CONCENTRATIONS ARE DISPLAYED FOR EACH LOCATION.
3. SOIL REMOVAL ACTION GOALS AS SELECTED IN THE SOIL ENGINEERING EVALUATION/COST ANALYSIS (JACOBS 2021).
4. MG/KG = MILLIGRAMS PER KILOGRAM
5. RBRG = RISK-BASED REMEDIAL GOAL
6. THIESSEN POLYGONS WITH A NON-DETECT CONCENTRATION ARE REPRESENTED BY THE REPORTING LIMIT.

Chromium, hexavalent	Units	Value	Basis
Background	mg/kg	0.83	Site-specific Soil Background Value
Human Health RBRG	mg/kg	3.1	Soil Removal Action Goal (Off-highway vehicle rider at 10-6 excess risk)
Human Health RBRG	mg/kg	31	Soil Removal Action Goal (Off-highway vehicle rider at 10-5 excess risk)

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

POST-NTCRA HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

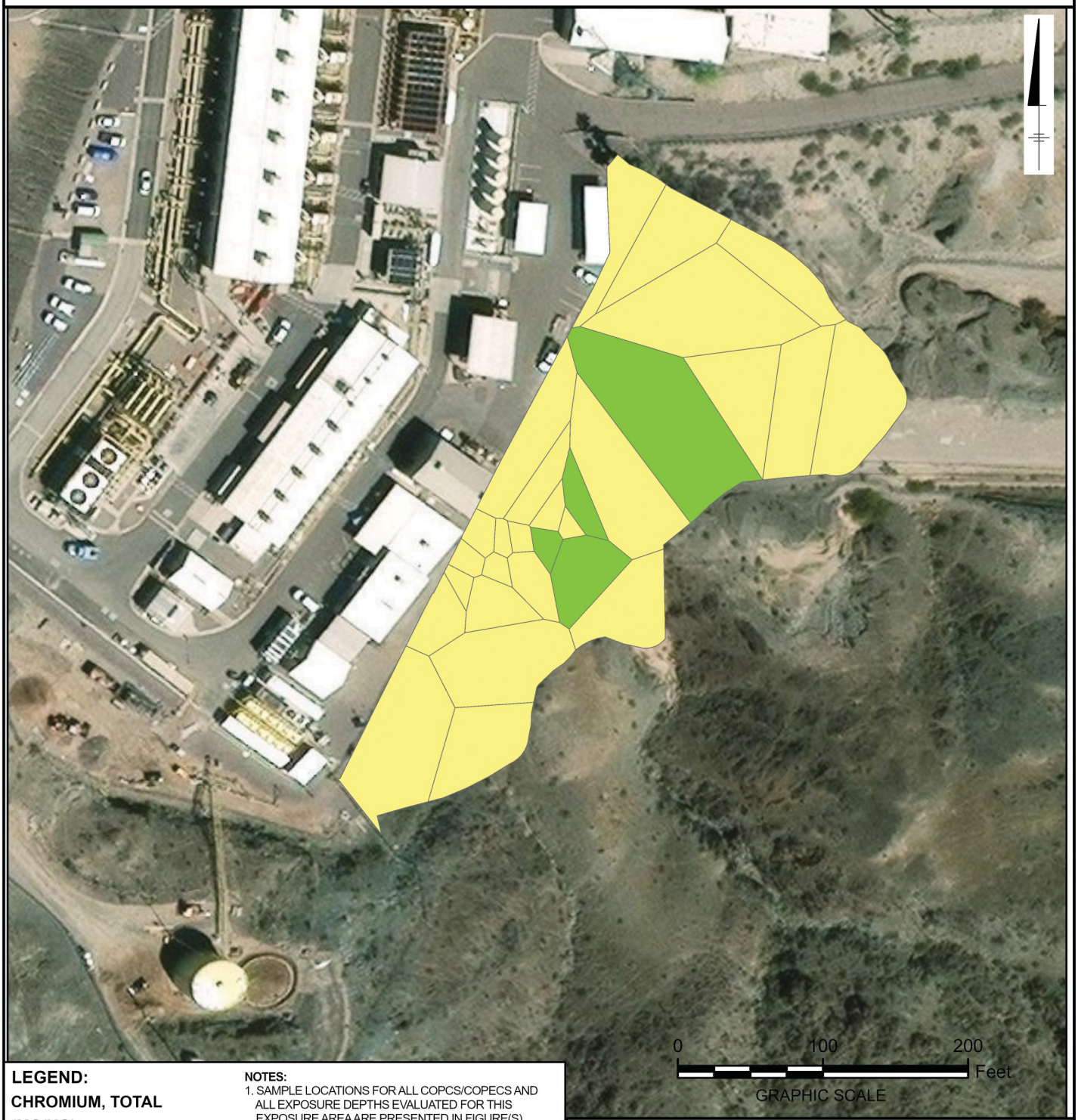
THIESSEN POLYGONS FOR AREA WEIGHTING

ARCADIS

FIGURE
AOC9-A3.2

T:_ENV\PGE_Topock\ArcPro\PostNTCRA_EcoRisk\PostNTCRA_ERA_ThiessMapbook_2025.aprx ThiessenWeighting_2025Nov Saved: 12/11/2025 ksinsabaugh

AOC 9
0 - 0.5 FEET BELOW GROUND SURFACE
CHROMIUM, TOTAL



LEGEND:

CHROMIUM, TOTAL (MG/KG)

- 0 - 39.8
- >39.8 - 145
- >145

NOTES:

1. SAMPLE LOCATIONS FOR ALL COPCS/COPECS AND ALL EXPOSURE DEPTHS EVALUATED FOR THIS EXPOSURE AREA ARE PRESENTED IN FIGURE(S) AOC9-1.2.
2. DEPTH-WEIGHTED CONCENTRATIONS ARE DISPLAYED FOR EACH LOCATION.
3. SOIL REMOVAL ACTION GOALS AS SELECTED IN THE SOIL ENGINEERING EVALUATION/COST ANALYSIS (JACOBS 2021).
4. MG/KG = MILLIGRAMS PER KILOGRAM
5. RBRG = RISK-BASED REMEDIAL GOAL

Chromium, total	Units	Value	Basis
Background	mg/kg	39.8	Site-specific Soil Background Value
Ecological RBRG	mg/kg	145	Soil Removal Action Goal (Desert shrew)

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

POST-NTCRA HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

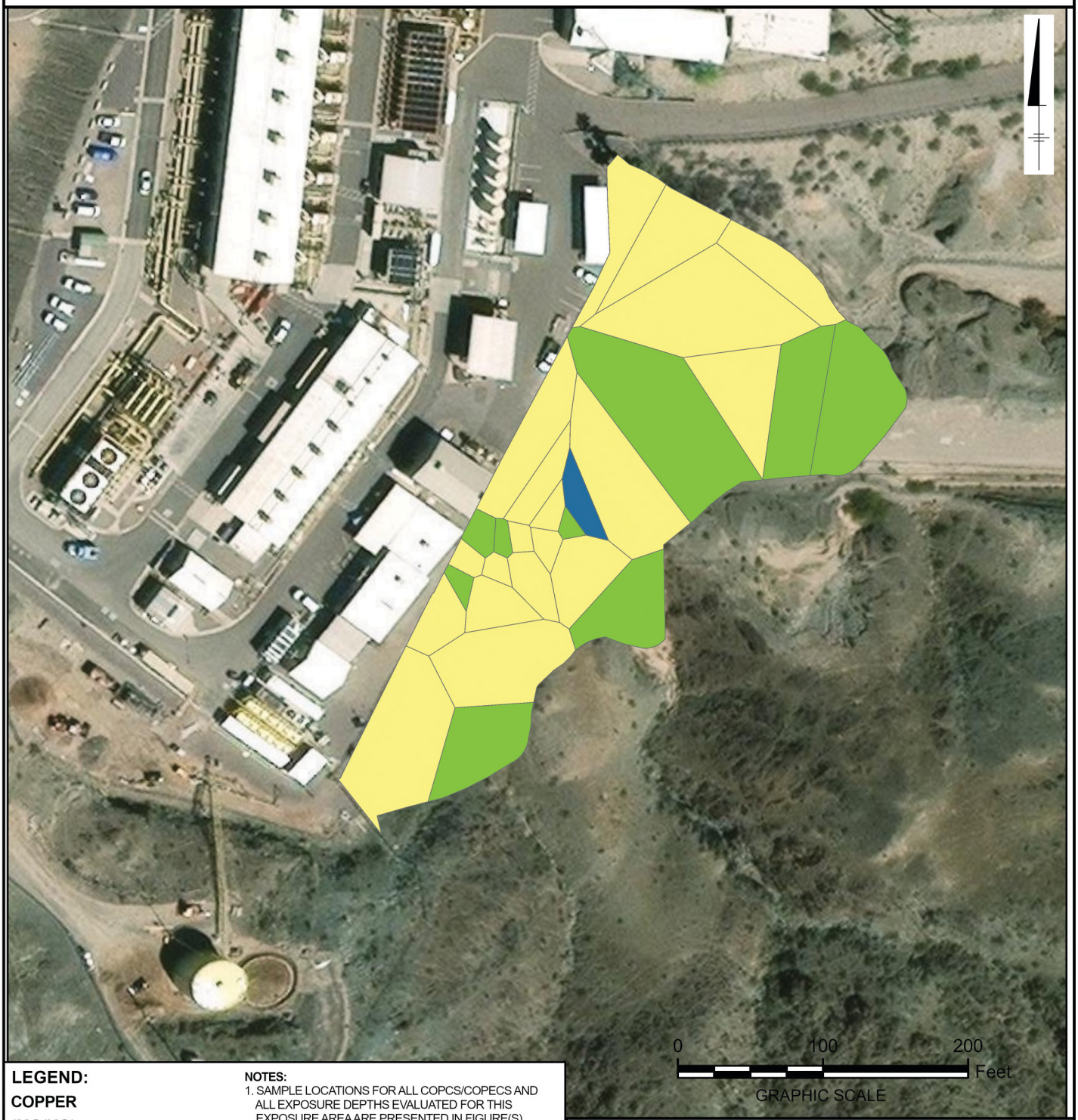
THIESSEN POLYGONS FOR AREA WEIGHTING

ARCADIS

FIGURE
AOC9-A3.3

T:_ENV\PGE_Topock\ArcPro\PostNTCRA_EcoRisk\PostNTCRA_ERA_ThiessMapbook_2025.aprx ThiessenWeighting_2025Nov Saved: 12/11/2025 ksinsabaugh

AOC 9
0 - 0.5 FEET BELOW GROUND SURFACE
COPPER



LEGEND:
COPPER
(MG/KG)

- 0 - 16.8
- >16.8 - 145
- >145

NOTES:
1. SAMPLE LOCATIONS FOR ALL COPCS/COPECS AND ALL EXPOSURE DEPTHS EVALUATED FOR THIS EXPOSURE AREA ARE PRESENTED IN FIGURE(S) AOC9-1.2.
2. DEPTH-WEIGHTED CONCENTRATIONS ARE DISPLAYED FOR EACH LOCATION.
3. SOIL REMOVAL ACTION GOALS AS SELECTED IN THE SOIL ENGINEERING EVALUATION/COST ANALYSIS (JACOBS 2021).
4. MG/KG = MILLIGRAMS PER KILOGRAM
5. RBRG = RISK-BASED REMEDIAL GOAL

Copper	Units	Value	Basis
Background	mg/kg	16.8	Site-specific Soil Background Value
Ecological RBRG	mg/kg	145	Soil Removal Action Goal (Desert shrew)

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

POST-NTCRA HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

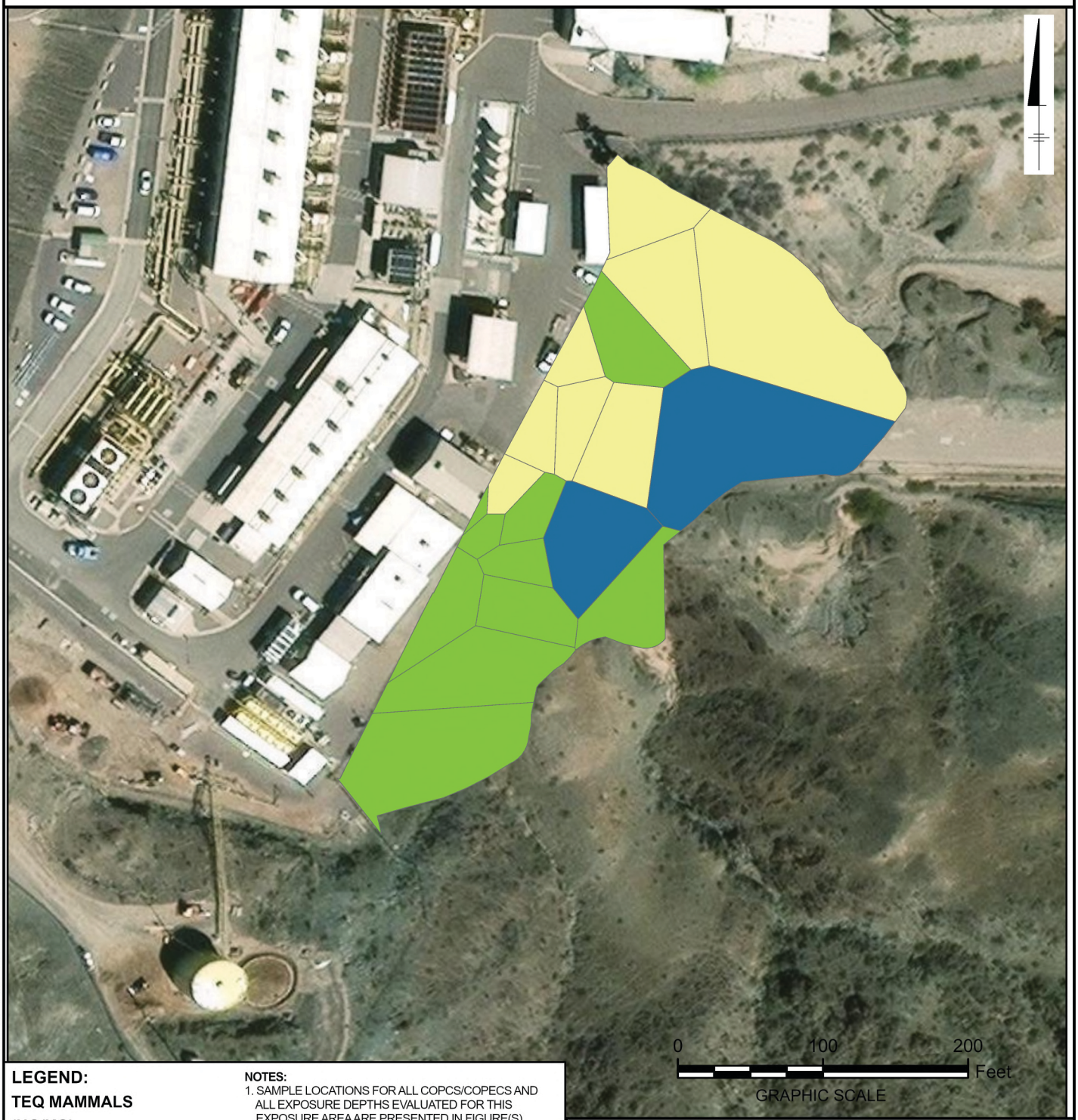
THIESSEN POLYGONS FOR AREA WEIGHTING

ARCADIS

FIGURE
AOC9-A3.4

T:_ENV\PGE_Topock\ArcPro\PostNTCRA_EcoRisk\PostNTCRA_ERA_ThiessMapbook_2025.aprx ThiessenWeighting_2025Nov Saved: 12/11/2025 ksinsabaugh

AOC 9
0 - 3 FEET BELOW GROUND SURFACE
TEQ MAMMALS



LEGEND:

TEQ MAMMALS (NG/KG)

- 0 - 5.58
- >5.58 - 100
- >100 - 190
- >190

NOTES:

1. SAMPLE LOCATIONS FOR ALL COPCS/COPECS AND ALL EXPOSURE DEPTHS EVALUATED FOR THIS EXPOSURE AREA ARE PRESENTED IN FIGURE(S) AOC9-1.2.
2. DEPTH-WEIGHTED CONCENTRATIONS ARE DISPLAYED FOR EACH LOCATION.
3. SOIL REMOVAL ACTION GOALS AS SELECTED IN THE SOIL ENGINEERING EVALUATION/COST ANALYSIS (JACOBS 2021).
4. NG/KG = NANOGRAMS PER KILOGRAM
5. RBRG = RISK-BASED REMEDIAL GOAL

TEQ Mammals	Units	Value	Basis
Background	ng/kg	5.58	Site-specific Soil Background Value
Human Health RBRG	ng/kg	100	Soil Removal Action Goal (Hiker at 10-6 excess risk)
Ecological RBRG	ng/kg	190	Soil Removal Action Goal (Desert shrew)
Human Health RBRG	ng/kg	1000	Hiker at 10-5 excess risk

PG&E TOPOCK COMPRESSOR STATION
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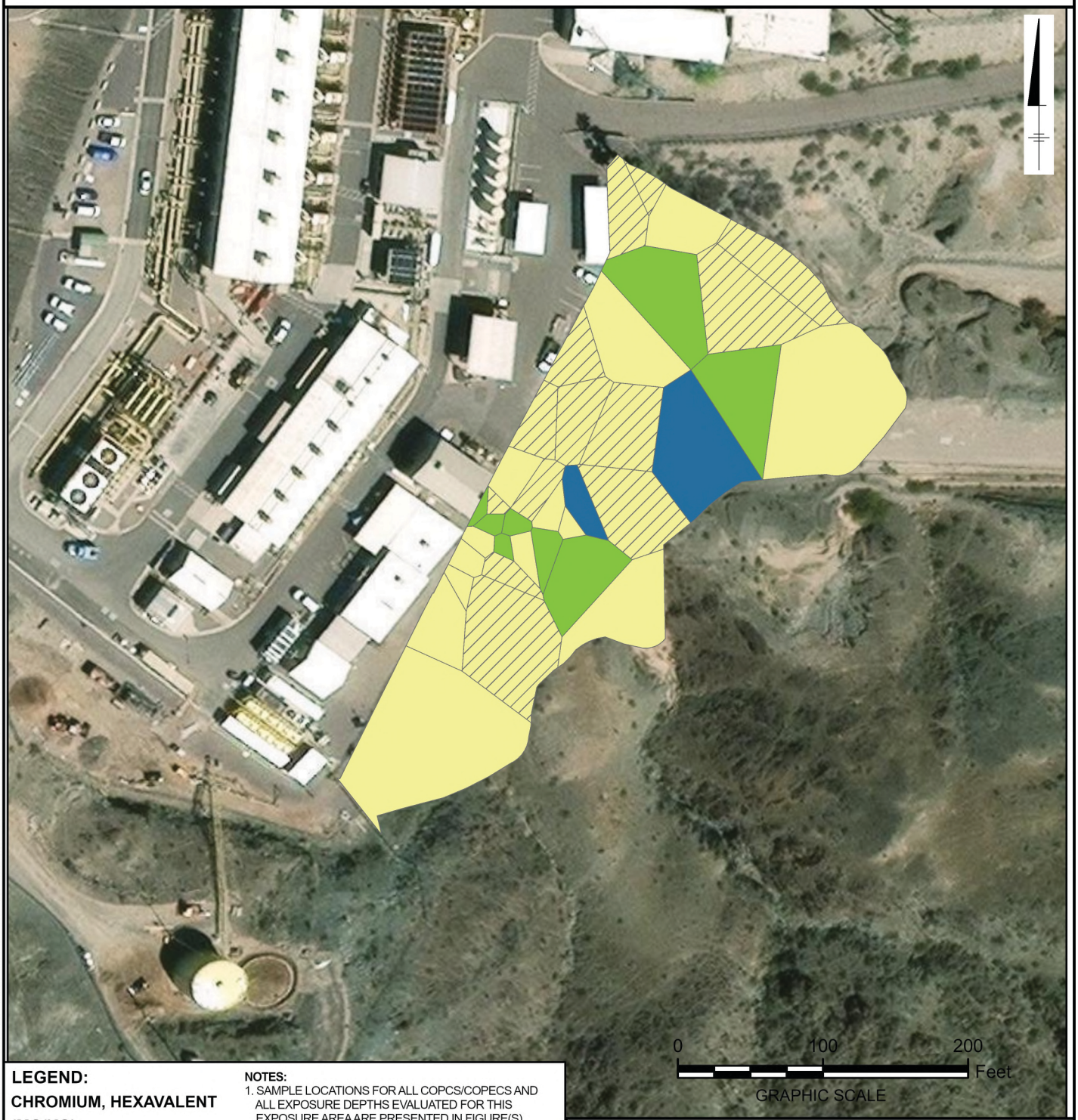
THIESSEN POLYGONS FOR AREA WEIGHTING

ARCADIS

FIGURE
AOC9-A3.5

T:_ENV\PGE_Topock\ArcPro\PostNTCRA_EcoRisk\PostNTCRA_ERA_ThiessMapbook_2025.aprx ThiessenWeighting_2025Nov Saved: 12/11/2025 ksinsabaugh

AOC 9
0 - 3 FEET BELOW GROUND SURFACE
CHROMIUM, HEXAVALENT



LEGEND:

CHROMIUM, HEXAVALENT (MG/KG)

- 0 - 0.83
- >0.83 - 3.1
- >3.1 - 31
- >31
- NOT DETECTED

NOTES:

1. SAMPLE LOCATIONS FOR ALL COPCS/COPECS AND ALL EXPOSURE DEPTHS EVALUATED FOR THIS EXPOSURE AREA ARE PRESENTED IN FIGURE(S) AOC9-1.2.
2. DEPTH-WEIGHTED CONCENTRATIONS ARE DISPLAYED FOR EACH LOCATION.
3. SOIL REMOVAL ACTION GOALS AS SELECTED IN THE SOIL ENGINEERING EVALUATION/COST ANALYSIS (JACOBS 2021).
4. MG/KG = MILLIGRAMS PER KILOGRAM
5. RBRG = RISK-BASED REMEDIAL GOAL
6. THIESSEN POLYGONS WITH A NON-DETECT CONCENTRATION ARE REPRESENTED BY THE REPORTING LIMIT.

Chromium, hexavalent	Units	Value	Basis
Background	mg/kg	0.83	Site-specific Soil Background Value
Human Health RBRG	mg/kg	3.1	Soil Removal Action Goal (Off-highway vehicle rider at 10-6 excess risk)
Human Health RBRG	mg/kg	31	Soil Removal Action Goal (Off-highway vehicle rider at 10-5 excess risk)

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

POST-NTCRA HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

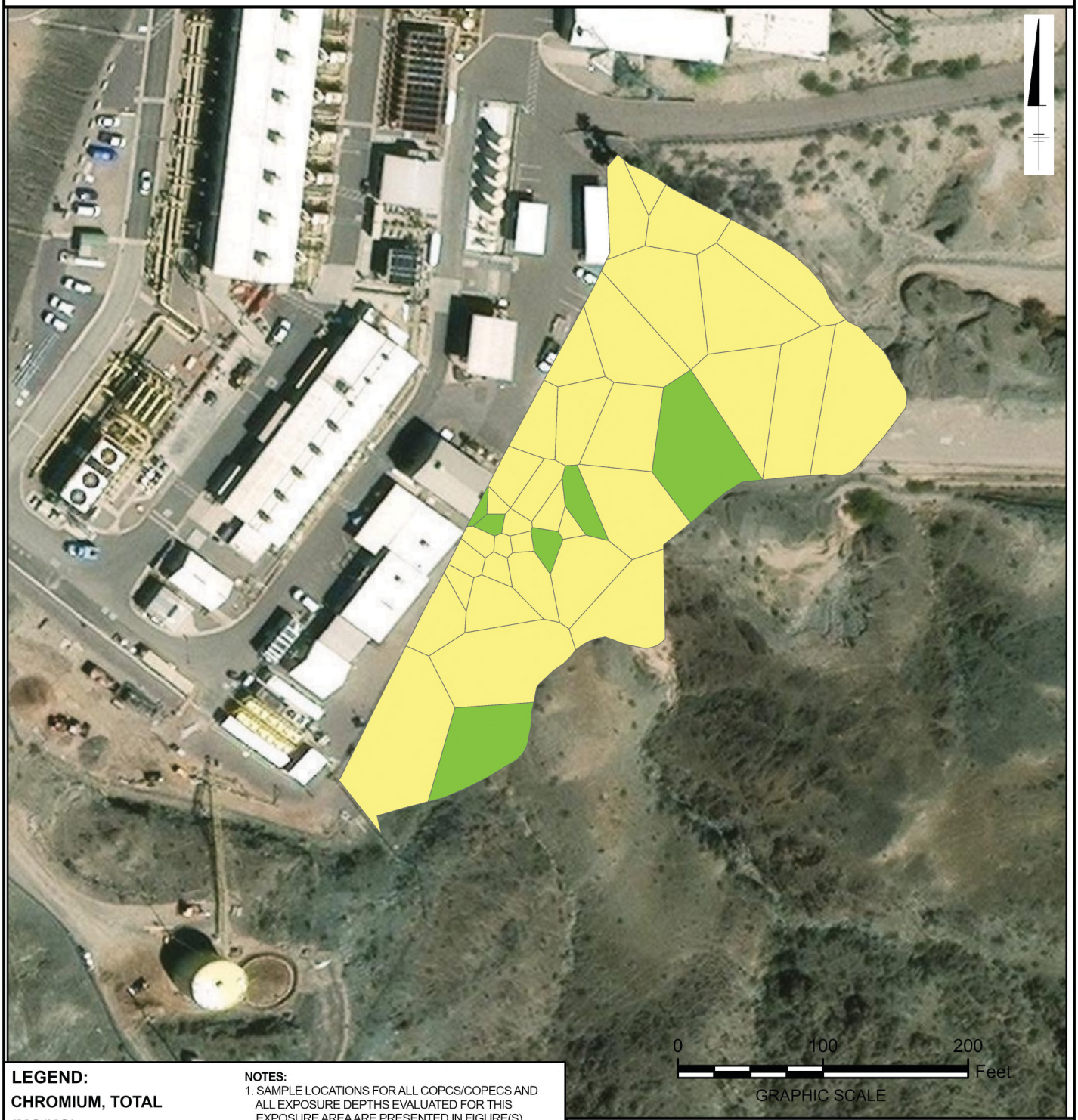
THIESSEN POLYGONS FOR AREA WEIGHTING

ARCADIS

FIGURE
AOC9-A3.6

T:_ENV\PGE_Topock\ArcPro\PostNTCRA_EcoRisk\PostNTCRA_ERA_ThiessMapbook_2025.aprx ThiessenWeighting_2025Nov Saved: 12/11/2025 ksinsabaugh

AOC 9
0 - 3 FEET BELOW GROUND SURFACE
CHROMIUM, TOTAL



LEGEND:

CHROMIUM, TOTAL (MG/KG)

- 0 - 39.8
- >39.8 - 145
- >145

NOTES:

1. SAMPLE LOCATIONS FOR ALL COPCS/COPECS AND ALL EXPOSURE DEPTHS EVALUATED FOR THIS EXPOSURE AREA ARE PRESENTED IN FIGURE(S) AOC9-1.2.
2. DEPTH-WEIGHTED CONCENTRATIONS ARE DISPLAYED FOR EACH LOCATION.
3. SOIL REMOVAL ACTION GOALS AS SELECTED IN THE SOIL ENGINEERING EVALUATION/COST ANALYSIS (JACOBS 2021).
4. MG/KG = MILLIGRAMS PER KILOGRAM
5. RBRG = RISK-BASED REMEDIAL GOAL

Chromium, total	Units	Value	Basis
Background	mg/kg	39.8	Site-specific Soil Background Value
Ecological RBRG	mg/kg	145	Soil Removal Action Goal (Desert shrew)

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POST-NTCRA HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

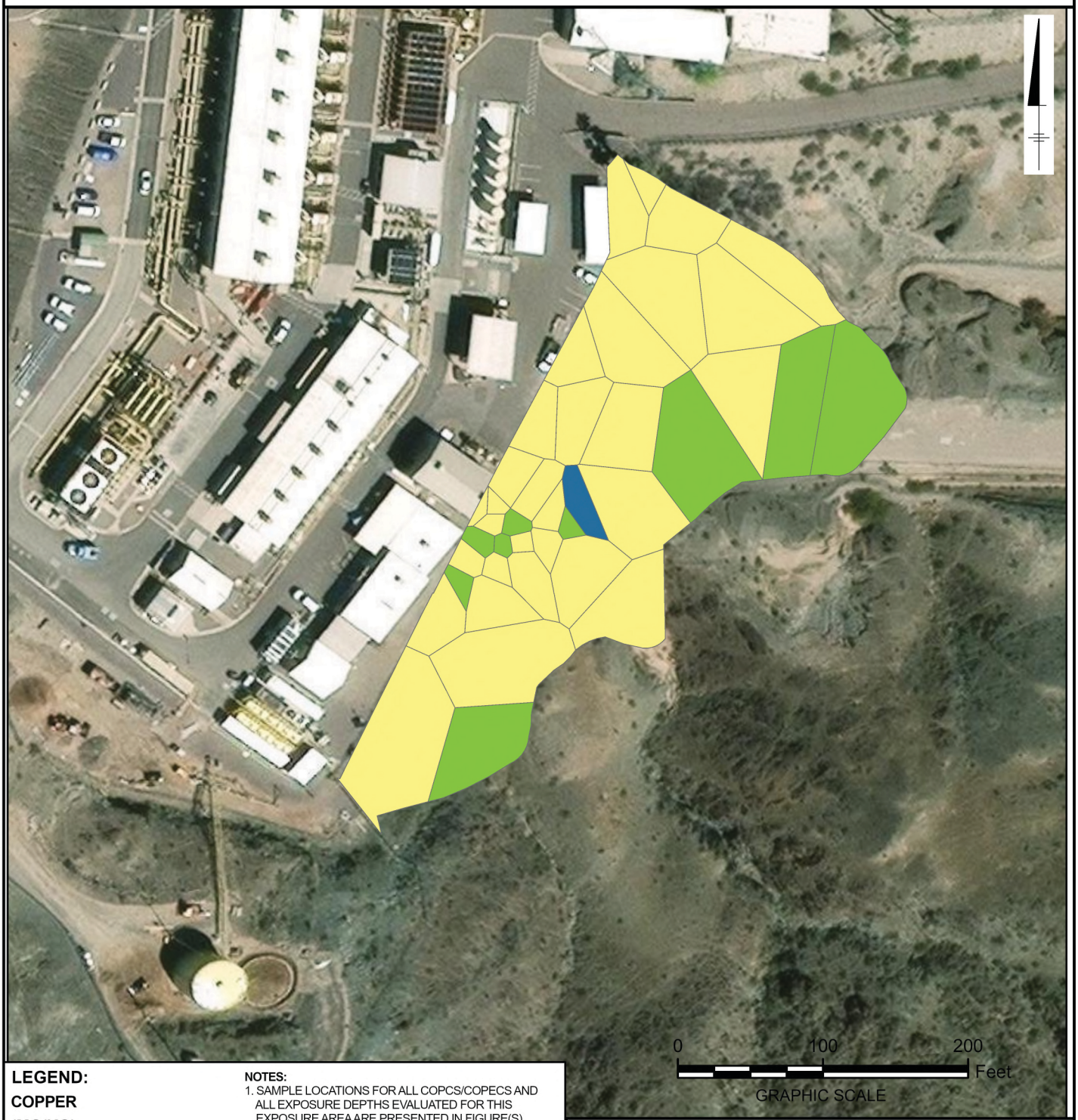
THIESSEN POLYGONS FOR AREA WEIGHTING

ARCADIS

FIGURE
AOC9-A3.7

T:_ENV\PGE_Topock\ArcPro\PostNTCRA_EcoRisk\PostNTCRA_ERA_ThiessMapbook_2025.aprx ThiessenWeighting_2025Nov Saved: 12/11/2025 ksinsabaugh

AOC 9
0 - 3 FEET BELOW GROUND SURFACE
COPPER



LEGEND:
COPPER
(MG/KG)

- 0 - 16.8
- >16.8 - 145
- >145

NOTES:
1. SAMPLE LOCATIONS FOR ALL COPCS/COPECS AND ALL EXPOSURE DEPTHS EVALUATED FOR THIS EXPOSURE AREA ARE PRESENTED IN FIGURE(S) AOC9-1.2.
2. DEPTH-WEIGHTED CONCENTRATIONS ARE DISPLAYED FOR EACH LOCATION.
3. SOIL REMOVAL ACTION GOALS AS SELECTED IN THE SOIL ENGINEERING EVALUATION/COST ANALYSIS (JACOBS 2021).
4. MG/KG = MILLIGRAMS PER KILOGRAM
5. RBRG = RISK-BASED REMEDIAL GOAL

Copper	Units	Value	Basis
Background	mg/kg	16.8	Site-specific Soil Background Value
Ecological RBRG	mg/kg	145	Soil Removal Action Goal (Desert shrew)

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

POST-NTCRA HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

THIESSEN POLYGONS FOR AREA WEIGHTING

ARCADIS

FIGURE
AOC9-A3.8

T:_ENV\PGE_Topock\ArcPro\PostNTCRA_EcoRisk\PostNTCRA_ERA_ThiessMapbook_2025.aprx ThiessenWeighting_2025Nov Saved: 12/11/2025 ksinsabaugh

ATTACHMENT B

Dose, Exposure Concentration, Risk, and Hazard Calculations for Human Health Receptors at AOC 9 Using Depth-Weighted EPCs and Area-Weighted EPCs

For additional help with the information provided in Attachment B, please contact Susan Shiu, Haley and Aldrich Associate Risk Assessor, at 1-510-879-4549.

Table AOC9-B1.1a
Baseline Scenario Exposure Concentration and Dose Calculations for Carcinogenic Effects for C O P Cs in AOC 9 Soil Using Depth-Weighted EPCs: Recreational User - Camper

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)
Inorganics								
Antimony	NC	NV	NC	NC	NC	NV	NC	NC
Arsenic	3.3E-11	NV	1.7E-08	1.8E-07	3.2E-11	NV	1.7E-08	1.7E-07
Chromium, Hexavalent	5.3E-11	NV	NA	4.8E-07	2.7E-11	NV	NA	2.5E-07
Chromium, total	NC	NV	NC	NC	NC	NV	NC	NC
Copper	NC	NV	NC	NC	NC	NV	NC	NC
Lead	na	na	na	na	na	na	na	na
Mercury (inorganic)	NC	NC	NC	NC	NC	NC	NC	NC
Nickel	9.6E-11	NV	NC	NC	9.4E-11	NV	NC	NC
Thallium	ND	NV	ND	ND	NC	NV	NC	NC
Zinc	NC	NV	NC	NC	NC	NV	NC	NC
Volatile Organic Compounds								
Isophorone	NC	NV	3.0E-08	9.2E-08	NC	NV	3.0E-07	9.4E-07
Polycyclic Aromatic Hydrocarbons								
1-Methyl naphthalene	9.6E-13	3.2E-09	2.5E-09	5.3E-09	1.5E-13	3.2E-09	4.0E-10	8.3E-10
2-Methyl naphthalene	NC	NV	NC	NC	NC	NV	NC	NC
Acenaphthene	NC	NV	NC	NC	NC	NV	NC	NC
Acenaphthylene	NC	NV	NC	NC	NC	NV	NC	NC
Anthracene	NC	NV	NC	NC	NC	NV	NC	NC
Benzo (a) anthracene	NA	7.0E-10	NA	NA	NA	7.0E-10	NA	NA
Benzo (a) pyrene	NA	NV	NA	NA	NA	NV	NA	NA
Benzo (b) fluoranthene	NA	NV	NA	NA	NA	NV	NA	NA
Benzo (ghi) perylene	NC	NV	NC	NC	NC	NV	NC	NC
Benzo (k) fluoranthene	NA	NV	NA	NA	NA	NV	NA	NA
Chrysene	NA	NV	NA	NA	NA	NV	NA	NA
Dibenzo (a,h) anthracene	NA	NV	NA	NA	NA	NV	NA	NA
Fluoranthene	NC	NV	NC	NC	NC	NV	NC	NC
Fluorene	NC	NV	NC	NC	NC	NV	NC	NC
Indeno (1,2,3-cd) pyrene	NA	NV	NA	NA	NA	NV	NA	NA
Naphthalene	9.6E-14	6.5E-10	2.5E-10	5.3E-10	2.6E-14	6.5E-10	6.8E-11	1.4E-10
Phenanthrene	NC	NV	NC	NC	NC	NV	NC	NC
Pyrene	NC	NV	NC	NC	NC	NV	NC	NC
B(a)P Equivalent	2.2E-11	NV	9.0E-08	2.0E-07	1.5E-11	NV	6.3E-08	1.4E-07
Pesticides								
4,4-DDE	1.9E-14	1.3E-11	1.7E-11	1.1E-10	1.9E-14	1.3E-11	1.7E-11	1.1E-10

Table AOC9-B1.1a
Baseline Scenario Exposure Concentration and Dose Calculations for Carcinogenic Effects for C O P Cs in AOC 9 Soil Using Depth-Weighted EPCs: Recreational User - Camper

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)
Polychlorinated Biphenyls								
Total PCBs	1.5E-12	1.7E-09	4.0E-09	8.2E-09	1.3E-12	1.7E-09	3.5E-09	7.2E-09
Total Petroleum Hydrocarbons								
TPH as diesel	NC	NC	NC	NC	NC	NC	NC	NC
TPH as motor oil	NC	NC	NC	NC	NC	NC	NC	NC
Dioxins/Furans								
TEQ Human	6.1E-16	1.3E-12	3.3E-13	3.4E-12	4.4E-16	1.3E-12	2.3E-13	2.4E-12

Notes:
[a] EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
CDI = Chronic Daily Intake.
C O P C = Constituent of Potential Concern.
EC = Exposure Concentration.
mg/kg-day = milligrams per kilogram per day.
mg/m^3 = milligrams per cubic meter.
na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/ E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.
NA = Not applicable. Carcinogenic polycyclic aromatic hydrocarbons (CPAHs) are evaluated using benzo(a)pyrene equivalents. Hexavalent chromium is not absorbed via dermal contact.
NC = Not considered a carcinogen.
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC9-B1.1b
Baseline Scenario Exposure Concentration and Dose Calculations for Carcinogenic Effects for C O P Cs in AOC 9 Soil Using Depth-Weighted EPCs: Recreational User - Hiker

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)
Inorganics								
Antimony	NC	NV	NC	NC	NC	NV	NC	NC
Arsenic	6.5E-11	NV	3.5E-08	3.6E-07	6.4E-11	NV	3.4E-08	3.5E-07
Chromium, Hexavalent	1.1E-10	NV	NA	9.5E-07	5.5E-11	NV	NA	4.9E-07
Chromium, total	NC	NV	NC	NC	NC	NV	NC	NC
Copper	NC	NV	NC	NC	NC	NV	NC	NC
Lead	na	na	na	na	na	na	na	na
Mercury (inorganic)	NC	NC	NC	NC	NC	NC	NC	NC
Nickel	1.9E-10	NV	NC	NC	1.9E-10	NV	NC	NC
Thallium	ND	NV	ND	ND	NC	NV	NC	NC
Zinc	NC	NV	NC	NC	NC	NV	NC	NC
Volatile Organic Compounds								
Isophorone	NC	NV	5.9E-08	1.8E-07	NC	NV	6.0E-07	1.9E-06
Polycyclic Aromatic Hydrocarbons								
1-Methyl naphthalene	1.9E-12	6.4E-09	5.1E-09	1.1E-08	3.0E-13	6.4E-09	8.0E-10	1.7E-09
2-Methyl naphthalene	NC	NV	NC	NC	NC	NV	NC	NC
Acenaphthene	NC	NV	NC	NC	NC	NV	NC	NC
Acenaphthylene	NC	NV	NC	NC	NC	NV	NC	NC
Anthracene	NC	NV	NC	NC	NC	NV	NC	NC
Benzo (a) anthracene	NA	1.4E-09	NA	NA	NA	1.4E-09	NA	NA
Benzo (a) pyrene	NA	NV	NA	NA	NA	NV	NA	NA
Benzo (b) fluoranthene	NA	NV	NA	NA	NA	NV	NA	NA
Benzo (ghi) perylene	NC	NV	NC	NC	NC	NV	NC	NC
Benzo (k) fluoranthene	NA	NV	NA	NA	NA	NV	NA	NA
Chrysene	NA	NV	NA	NA	NA	NV	NA	NA
Dibenzo (a,h) anthracene	NA	NV	NA	NA	NA	NV	NA	NA
Fluoranthene	NC	NV	NC	NC	NC	NV	NC	NC
Fluorene	NC	NV	NC	NC	NC	NV	NC	NC
Indeno (1,2,3-cd) pyrene	NA	NV	NA	NA	NA	NV	NA	NA
Naphthalene	1.9E-13	1.3E-09	5.1E-10	1.1E-09	5.2E-14	1.3E-09	1.4E-10	2.8E-10
Phenanthrene	NC	NV	NC	NC	NC	NV	NC	NC
Pyrene	NC	NV	NC	NC	NC	NV	NC	NC
B(a)P Equivalent	4.4E-11	NV	1.8E-07	3.9E-07	3.1E-11	NV	1.3E-07	2.7E-07
Pesticides								
4,4-DDE	3.8E-14	2.5E-11	3.4E-11	2.1E-10	3.8E-14	2.5E-11	3.4E-11	2.1E-10

Table AOC9-B1.1b
Baseline Scenario Exposure Concentration and Dose Calculations for Carcinogenic Effects for C O P Cs in AOC 9 Soil Using Depth-Weighted EPCs: Recreational User - Hiker

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)
Polychlorinated Biphenyls								
Total PCBs	3.0E-12	3.4E-09	7.9E-09	1.6E-08	2.6E-12	3.4E-09	6.9E-09	1.4E-08
Total Petroleum Hydrocarbons								
TPH as diesel	NC	NC	NC	NC	NC	NC	NC	NC
TPH as motor oil	NC	NC	NC	NC	NC	NC	NC	NC
Dioxins/Furans								
TEQ Human	1.2E-15	2.6E-12	6.5E-13	6.7E-12	8.8E-16	2.6E-12	4.6E-13	4.8E-12

Notes:
[a] EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
CDI = Chronic Daily Intake.
C O P C = Constituent of Potential Concern.
EC = Exposure Concentration.
mg/kg-day = milligrams per kilogram per day.
mg/m^3 = milligrams per cubic meter.
na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/ E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.
NA = Not applicable. Carcinogenic polycyclic aromatic hydrocarbons (CPAHs) are evaluated using benzo(a)pyrene equivalents. Hexavalent chromium is not absorbed via dermal contact.
NC = Not considered a carcinogen.
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC9-B1.1c
Baseline Scenario Exposure Concentration and Dose Calculations for Carcinogenic Effects for C O P Cs in AOC 9 Soil Using Depth-Weighted EPCs: Recreational User - Off-Highway Vehicle Rider

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)
Inorganics								
Antimony	NC	NV	NC	NC	NC	NV	NC	NC
Arsenic	6.5E-09	NV	1.7E-07	4.6E-08	6.4E-09	NV	1.6E-07	4.5E-08
Chromium, Hexavalent	6.8E-09	NV	NA	5.5E-08	3.5E-09	NV	NA	2.9E-08
Chromium, total	NC	NV	NC	NC	NC	NV	NC	NC
Copper	NC	NV	NC	NC	NC	NV	NC	NC
Lead	na	na	na	na	na	na	na	na
Mercury (inorganic)	NC	NC	NC	NC	NC	NC	NC	NC
Nickel	1.9E-08	NV	NC	NC	1.9E-08	NV	NC	NC
Thallium	ND	NV	ND	ND	NC	NV	NC	NC
Zinc	NC	NV	NC	NC	NC	NV	NC	NC
Volatile Organic Compounds								
Isophorone	NC	NV	2.9E-07	2.3E-08	NC	NV	2.9E-06	2.4E-07
Polycyclic Aromatic Hydrocarbons								
1-Methyl naphthalene	1.9E-10	4.0E-10	2.4E-08	1.3E-09	3.0E-11	4.0E-10	3.8E-09	2.1E-10
2-Methyl naphthalene	NC	NV	NC	NC	NC	NV	NC	NC
Acenaphthene	NC	NV	NC	NC	NC	NV	NC	NC
Acenaphthylene	NC	NV	NC	NC	NC	NV	NC	NC
Anthracene	NC	NV	NC	NC	NC	NV	NC	NC
Benzo (a) anthracene	NA	5.6E-11	NA	NA	NA	5.6E-11	NA	NA
Benzo (a) pyrene	NA	NV	NA	NA	NA	NV	NA	NA
Benzo (b) fluoranthene	NA	NV	NA	NA	NA	NV	NA	NA
Benzo (ghi) perylene	NC	NV	NC	NC	NC	NV	NC	NC
Benzo (k) fluoranthene	NA	NV	NA	NA	NA	NV	NA	NA
Chrysene	NA	NV	NA	NA	NA	NV	NA	NA
Dibenzo (a,h) anthracene	NA	NV	NA	NA	NA	NV	NA	NA
Fluoranthene	NC	NV	NC	NC	NC	NV	NC	NC
Fluorene	NC	NV	NC	NC	NC	NV	NC	NC
Indeno (1,2,3-cd) pyrene	NA	NV	NA	NA	NA	NV	NA	NA
Naphthalene	1.9E-11	8.1E-11	2.4E-09	1.3E-10	5.2E-12	8.1E-11	6.6E-10	3.6E-11
Phenanthrene	NC	NV	NC	NC	NC	NV	NC	NC
Pyrene	NC	NV	NC	NC	NC	NV	NC	NC
B(a)P Equivalent	2.8E-09	NV	3.7E-07	2.3E-08	2.0E-09	NV	2.6E-07	1.6E-08
Pesticides								
4,4-DDE	3.8E-12	1.6E-12	1.6E-10	2.7E-11	3.8E-12	1.6E-12	1.6E-10	2.7E-11

Table AOC9-B1.1c
Baseline Scenario Exposure Concentration and Dose Calculations for Carcinogenic Effects for C O P Cs in AOC 9 Soil Using Depth-Weighted EPCs: Recreational User - Off-Highway Vehicle Rider

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C O P C	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)
Polychlorinated Biphenyls								
Total PCBs	3.0E-10	2.1E-10	3.8E-08	2.1E-09	2.6E-10	2.1E-10	3.3E-08	1.8E-09
Total Petroleum Hydrocarbons								
TPH as diesel	NC	NC	NC	NC	NC	NC	NC	NC
TPH as motor oil	NC	NC	NC	NC	NC	NC	NC	NC
Dioxins/Furans								
TEQ Human	1.2E-13	1.6E-13	3.1E-12	8.6E-13	8.8E-14	1.6E-13	2.2E-12	6.1E-13

Notes:
[a] EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
CDI = Chronic Daily Intake.
C O P C = Constituent of Potential Concern.
EC = Exposure Concentration.
mg/kg-day = milligrams per kilogram per day.
mg/m^3 = milligrams per cubic meter.
na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/ E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.
NA = Not applicable. Carcinogenic polycyclic aromatic hydrocarbons (CPAHs) are evaluated using benzo(a)pyrene equivalents. Hexavalent chromium is not absorbed via dermal contact.
NC = Not considered a carcinogen.
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC9-B1.2a
Baseline Scenario Exposure Concentration and Dose Calculations for Noncarcinogenic Effects for C O P Cs in AOC 9 Soil Using Depth-Weighted EPCs: Recreational User - Camper

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Child Camper (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Child Camper (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Child Camper (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child Camper (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)
Inorganics																
Antimony	2.4E-10	NV	1.3E-07	4.4E-06	2.4E-10	NV	1.7E-08	4.1E-07	1.7E-10	NV	8.7E-08	3.0E-06	1.7E-10	NV	1.2E-08	2.8E-07
Arsenic	8.8E-11	NV	1.4E-07	1.6E-06	8.8E-11	NV	1.9E-08	1.5E-07	8.6E-11	NV	1.4E-07	1.6E-06	8.6E-11	NV	1.8E-08	1.5E-07
Chromium, Hexavalent	5.2E-11	NV	NA	9.3E-07	5.2E-11	NV	NA	8.8E-08	2.7E-11	NV	NA	4.8E-07	2.7E-11	NV	NA	4.5E-08
Chromium, total	6.1E-10	NV	3.2E-07	1.1E-05	6.1E-10	NV	4.4E-08	1.0E-06	5.3E-10	NV	2.8E-07	9.5E-06	5.3E-10	NV	3.8E-08	8.9E-07
Copper	6.3E-10	NV	3.3E-07	1.1E-05	6.3E-10	NV	4.5E-08	1.1E-06	3.4E-10	NV	1.8E-07	6.2E-06	3.4E-10	NV	2.4E-08	5.8E-07
Lead	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	7.5E-11	NV	4.0E-08	1.4E-06	7.5E-11	NV	5.4E-09	1.3E-07	5.0E-11	NV	2.7E-08	9.1E-07	5.0E-11	NV	3.6E-09	8.6E-08
Nickel	2.6E-10	NV	1.4E-07	4.7E-06	2.6E-10	NV	1.9E-08	4.4E-07	2.5E-10	NV	1.3E-07	4.6E-06	2.5E-10	NV	1.8E-08	4.3E-07
Thallium	ND	NV	ND	ND	ND	NV	ND	ND	2.4E-11	NV	1.3E-08	4.4E-07	2.4E-11	NV	1.8E-09	4.2E-08
Zinc	4.4E-09	NV	2.3E-06	8.1E-05	4.4E-09	NV	3.2E-07	7.6E-06	4.2E-09	NV	2.2E-06	7.7E-05	4.2E-09	NV	3.0E-07	7.2E-06
Volatile Organic Compounds																
Isophorone	4.5E-11	NV	2.4E-07	8.2E-07	4.5E-11	NV	3.2E-08	7.7E-08	4.6E-10	NV	2.4E-06	8.4E-06	4.6E-10	NV	3.3E-07	7.8E-07
Polycyclic Aromatic Hydrocarbons																
1-Methyl naphthalene	2.6E-12	8.7E-09	2.0E-08	4.7E-08	2.6E-12	8.7E-09	2.8E-09	4.4E-09	4.0E-13	8.7E-09	3.2E-09	7.3E-09	4.0E-13	8.7E-09	4.4E-10	6.9E-10
2-Methyl naphthalene	1.9E-12	8.7E-09	1.5E-08	3.5E-08	1.9E-12	8.7E-09	2.1E-09	3.3E-09	9.3E-14	8.7E-09	7.4E-10	1.7E-09	9.3E-14	8.7E-09	1.0E-10	1.6E-10
Acenaphthene	1.4E-13	4.1E-10	1.1E-09	2.5E-09	1.4E-13	4.1E-10	1.5E-10	2.3E-10	5.0E-14	4.1E-10	3.9E-10	9.1E-10	5.0E-14	4.1E-10	5.4E-11	8.5E-11
Acenaphthylene	4.2E-13	NV	3.3E-09	7.6E-09	4.2E-13	NV	4.5E-10	7.1E-10	2.9E-13	NV	2.3E-09	5.3E-09	2.9E-13	NV	3.2E-10	5.0E-10
Anthracene	2.6E-13	6.5E-10	2.1E-09	4.8E-09	2.6E-13	6.5E-10	2.8E-10	4.5E-10	2.2E-13	6.5E-10	1.7E-09	3.9E-09	2.2E-13	6.5E-10	2.3E-10	3.7E-10
Benzo (a) anthracene	4.4E-12	6.8E-10	3.5E-08	8.1E-08	4.4E-12	6.8E-10	4.8E-09	7.6E-09	3.5E-12	6.8E-10	2.8E-08	6.4E-08	3.5E-12	6.8E-10	3.8E-09	6.0E-09
Benzo (a) pyrene	1.2E-11	NV	9.5E-08	2.2E-07	1.2E-11	NV	1.3E-08	2.0E-08	8.4E-12	NV	6.6E-08	1.5E-07	8.4E-12	NV	9.1E-09	1.4E-08
Benzo (b) fluoranthene	3.6E-11	NV	2.8E-07	6.5E-07	3.6E-11	NV	3.9E-08	6.1E-08	2.4E-11	NV	1.9E-07	4.4E-07	2.4E-11	NV	2.6E-08	4.2E-08
Benzo (ghi) perylene	4.6E-12	NV	3.6E-08	8.4E-08	4.6E-12	NV	5.0E-09	7.8E-09	4.0E-12	NV	3.1E-08	7.2E-08	4.0E-12	NV	4.3E-09	6.7E-09
Benzo (k) fluoranthene	1.4E-11	NV	1.1E-07	2.5E-07	1.4E-11	NV	1.5E-08	2.3E-08	9.4E-12	NV	7.4E-08	1.7E-07	9.4E-12	NV	1.0E-08	1.6E-08
Chrysene	1.4E-11	NV	1.1E-07	2.6E-07	1.4E-11	NV	1.5E-08	2.4E-08	9.9E-12	NV	7.8E-08	1.8E-07	9.9E-12	NV	1.1E-08	1.7E-08
Dibenzo (a,h) anthracene	8.3E-13	NV	6.6E-09	1.5E-08	8.3E-13	NV	9.0E-10	1.4E-09	8.3E-13	NV	6.5E-09	1.5E-08	8.3E-13	NV	8.9E-10	1.4E-09
Fluoranthene	9.4E-12	NV	7.4E-08	1.7E-07	9.4E-12	NV	1.0E-08	1.6E-08	7.2E-12	NV	5.7E-08	1.3E-07	7.2E-12	NV	7.7E-09	1.2E-08
Fluorene	1.6E-13	2.9E-10	1.2E-09	2.9E-09	1.6E-13	2.9E-10	1.7E-10	2.7E-10	1.2E-13	2.9E-10	9.4E-10	2.2E-09	1.2E-13	2.9E-10	1.3E-10	2.0E-10
Indeno (1,2,3-cd) pyrene	4.0E-12	NV	3.2E-08	7.3E-08	4.0E-12	NV	4.3E-09	6.8E-09	1.5E-12	NV	1.2E-08	2.7E-08	1.5E-12	NV	1.6E-09	2.5E-09
Naphthalene	2.6E-13	1.7E-09	2.0E-09	4.7E-09	2.6E-13	1.7E-09	2.8E-10	4.4E-10	7.0E-14	1.7E-09	5.5E-10	1.3E-09	7.0E-14	1.7E-09	7.5E-11	1.2E-10
Phenanthrene	1.8E-12	NV	1.4E-08	3.3E-08	1.8E-12	NV	2.0E-09	3.1E-09	1.8E-12	NV	1.4E-08	3.2E-08	1.8E-12	NV	1.9E-09	3.0E-09
Pyrene	9.3E-12	2.2E-09	7.3E-08	1.7E-07	9.3E-12	2.2E-09	1.0E-08	1.6E-08	7.0E-12	2.2E-09	5.5E-08	1.3E-07	7.0E-12	2.2E-09	7.5E-09	1.2E-08
B(a)P Equivalent	NA	NV	NA	NA	NA	NV	NA	NA	NA	NV	NA	NA	NA	NV	NA	NA
Pesticides																
4,4-DDE	5.2E-14	3.4E-11	1.4E-10	9.4E-10	5.2E-14	3.4E-11	1.9E-11	8.8E-11	5.2E-14	3.4E-11	1.4E-10	9.4E-10	5.2E-14	3.4E-11	1.9E-11	8.8E-11
Polychlorinated Biphenyls																
Total PCBs	4.0E-12	4.6E-09	3.2E-08	7.3E-08	4.0E-12	4.6E-09	4.3E-09	6.8E-09	3.5E-12	4.6E-09	2.8E-08	6.4E-08	3.5E-12	4.6E-09	3.8E-09	6.0E-09
Total Petroleum Hydrocarbons																
TPH as diesel	1.3E-08	1.7E-03	7.1E-05	2.4E-04	1.3E-08	1.7E-03	9.7E-06	2.3E-05	8.9E-09	1.7E-03	4.7E-05	1.6E-04	8.9E-09	1.7E-03	6.4E-06	1.5E-05
TPH as motor oil	3.0E-08	NV	1.6E-04	5.5E-04	3.0E-08	NV	2.2E-05	5.1E-05	2.0E-08	NV	1.1E-04	3.7E-04	2.0E-08	NV	1.5E-05	3.5E-05

Table AOC9-B1.2a
Baseline Scenario Exposure Concentration and Dose Calculations for Noncarcinogenic Effects for C O P Cs in AOC 9 Soil Using Depth-Weighted EPCs: Recreational User - Camper

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Child Camper (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Child Camper (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Child Camper (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child Camper (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)
Dioxins/Furans																
TEQ Human	1.7E-15	3.5E-12	2.6E-12	3.0E-11	1.7E-15	3.5E-12	3.6E-13	2.8E-12	1.2E-15	3.5E-12	1.9E-12	2.1E-11	1.2E-15	3.5E-12	2.5E-13	2.0E-12

Notes:
[a] EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
CDI = Chronic Daily Intake.
C O P C = Constituent of Potential Concern.
EC = Exposure Concentration.
mg/kg-day = milligrams per kilogram per day.
mg/m^3 = milligrams per cubic meter.
na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/ E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.
NA = Not applicable. Noncancer effects of carcinogenic polycyclic aromatic hydrocarbons (CPAHs) are evaluated separately for each chemical (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene).
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC9-B1.2b
Baseline Scenario Exposure Concentration and Dose Calculations for Noncarcinogenic Effects for C O P Cs in AOC 9 Soil Using Depth-Weighted EPCs: Recreational User - Hiker

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)
Inorganics																
Antimony	4.8E-10	NV	2.5E-07	8.8E-06	4.8E-10	NV	3.5E-08	8.2E-07	3.3E-10	NV	1.7E-07	6.0E-06	3.3E-10	NV	2.4E-08	5.6E-07
Arsenic	1.8E-10	NV	2.8E-07	3.2E-06	1.8E-10	NV	3.8E-08	3.0E-07	1.7E-10	NV	2.7E-07	3.1E-06	1.7E-10	NV	3.7E-08	2.9E-07
Chromium, Hexavalent	1.0E-10	NV	NA	1.9E-06	1.0E-10	NV	NA	1.8E-07	5.3E-11	NV	NA	9.7E-07	5.3E-11	NV	NA	9.1E-08
Chromium, total	1.2E-09	NV	6.4E-07	2.2E-05	1.2E-09	NV	8.8E-08	2.1E-06	1.1E-09	NV	5.5E-07	1.9E-05	1.1E-09	NV	7.6E-08	1.8E-06
Copper	1.3E-09	NV	6.6E-07	2.3E-05	1.3E-09	NV	9.1E-08	2.1E-06	6.8E-10	NV	3.6E-07	1.2E-05	6.8E-10	NV	4.9E-08	1.2E-06
Lead	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	1.5E-10	NV	7.9E-08	2.7E-06	1.5E-10	NV	1.1E-08	2.6E-07	1.0E-10	NV	5.3E-08	1.8E-06	1.0E-10	NV	7.2E-09	1.7E-07
Nickel	5.2E-10	NV	2.7E-07	9.4E-06	5.2E-10	NV	3.7E-08	8.8E-07	5.1E-10	NV	2.7E-07	9.2E-06	5.1E-10	NV	3.6E-08	8.6E-07
Thallium	ND	NV	ND	ND	ND	NV	ND	ND	4.9E-11	NV	2.6E-08	8.9E-07	4.9E-11	NV	3.5E-09	8.3E-08
Zinc	8.9E-09	NV	4.7E-06	1.6E-04	8.9E-09	NV	6.4E-07	1.5E-05	8.4E-09	NV	4.4E-06	1.5E-04	8.4E-09	NV	6.1E-07	1.4E-05
Volatile Organic Compounds																
Isophorone	9.0E-11	NV	4.7E-07	1.6E-06	9.0E-11	NV	6.5E-08	1.5E-07	9.2E-10	NV	4.8E-06	1.7E-05	9.2E-10	NV	6.6E-07	1.6E-06
Polycyclic Aromatic Hydrocarbons																
1-Methyl naphthalene	5.2E-12	1.7E-08	4.1E-08	9.4E-08	5.2E-12	1.7E-08	5.6E-09	8.8E-09	8.1E-13	1.7E-08	6.4E-09	1.5E-08	8.1E-13	1.7E-08	8.7E-10	1.4E-09
2-Methyl naphthalene	3.9E-12	1.7E-08	3.1E-08	7.0E-08	3.9E-12	1.7E-08	4.2E-09	6.6E-09	1.9E-13	1.7E-08	1.5E-09	3.4E-09	1.9E-13	1.7E-08	2.0E-10	3.2E-10
Acenaphthene	2.7E-13	8.3E-10	2.2E-09	5.0E-09	2.7E-13	8.3E-10	2.9E-10	4.7E-10	1.0E-13	8.3E-10	7.9E-10	1.8E-09	1.0E-13	8.3E-10	1.1E-10	1.7E-10
Acenaphthylene	8.4E-13	NV	6.6E-09	1.5E-08	8.4E-13	NV	9.0E-10	1.4E-09	5.9E-13	NV	4.6E-09	1.1E-08	5.9E-13	NV	6.3E-10	1.0E-09
Anthracene	5.3E-13	1.3E-09	4.1E-09	9.5E-09	5.3E-13	1.3E-09	5.7E-10	8.9E-10	4.4E-13	1.3E-09	3.4E-09	7.9E-09	4.4E-13	1.3E-09	4.7E-10	7.4E-10
Benzo (a) anthracene	8.9E-12	1.4E-09	7.0E-08	1.6E-07	8.9E-12	1.4E-09	9.6E-09	1.5E-08	7.0E-12	1.4E-09	5.5E-08	1.3E-07	7.0E-12	1.4E-09	7.6E-09	1.2E-08
Benzo (a) pyrene	2.4E-11	NV	1.9E-07	4.4E-07	2.4E-11	NV	2.6E-08	4.1E-08	1.7E-11	NV	1.3E-07	3.1E-07	1.7E-11	NV	1.8E-08	2.9E-08
Benzo (b) fluoranthene	7.2E-11	NV	5.6E-07	1.3E-06	7.2E-11	NV	7.7E-08	1.2E-07	4.9E-11	NV	3.9E-07	8.9E-07	4.9E-11	NV	5.3E-08	8.3E-08
Benzo (ghi) perylene	9.2E-12	NV	7.3E-08	1.7E-07	9.2E-12	NV	9.9E-09	1.6E-08	7.9E-12	NV	6.3E-08	1.4E-07	7.9E-12	NV	8.5E-09	1.3E-08
Benzo (k) fluoranthene	2.8E-11	NV	2.2E-07	5.0E-07	2.8E-11	NV	3.0E-08	4.7E-08	1.9E-11	NV	1.5E-07	3.4E-07	1.9E-11	NV	2.0E-08	3.2E-08
Chrysene	2.8E-11	NV	2.2E-07	5.2E-07	2.8E-11	NV	3.1E-08	4.8E-08	2.0E-11	NV	1.6E-07	3.6E-07	2.0E-11	NV	2.1E-08	3.4E-08
Dibenzo (a,h) anthracene	1.7E-12	NV	1.3E-08	3.0E-08	1.7E-12	NV	1.8E-09	2.8E-09	1.7E-12	NV	1.3E-08	3.0E-08	1.7E-12	NV	1.8E-09	2.8E-09
Fluoranthene	1.9E-11	NV	1.5E-07	3.4E-07	1.9E-11	NV	2.0E-08	3.2E-08	1.4E-11	NV	1.1E-07	2.6E-07	1.4E-11	NV	1.5E-08	2.4E-08
Fluorene	3.2E-13	5.8E-10	2.5E-09	5.7E-09	3.2E-13	5.8E-10	3.4E-10	5.4E-10	2.4E-13	5.8E-10	1.9E-09	4.3E-09	2.4E-13	5.8E-10	2.6E-10	4.1E-10
Indeno (1,2,3-cd) pyrene	8.0E-12	NV	6.3E-08	1.5E-07	8.0E-12	NV	8.6E-09	1.4E-08	3.0E-12	NV	2.3E-08	5.4E-08	3.0E-12	NV	3.2E-09	5.0E-09
Naphthalene	5.2E-13	3.5E-09	4.1E-09	9.4E-09	5.2E-13	3.5E-09	5.6E-10	8.8E-10	1.4E-13	3.5E-09	1.1E-09	2.5E-09	1.4E-13	3.5E-09	1.5E-10	2.4E-10
Phenanthrene	3.7E-12	NV	2.9E-08	6.7E-08	3.7E-12	NV	4.0E-09	6.2E-09	3.6E-12	NV	2.8E-08	6.5E-08	3.6E-12	NV	3.9E-09	6.1E-09
Pyrene	1.9E-11	4.5E-09	1.5E-07	3.4E-07	1.9E-11	4.5E-09	2.0E-08	3.1E-08	1.4E-11	4.5E-09	1.1E-07	2.5E-07	1.4E-11	4.5E-09	1.5E-08	2.4E-08
B(a)P Equivalent	NA	NV	NA	NA	NA	NV	NA	NA	NA	NV	NA	NA	NA	NV	NA	NA
Pesticides																
4,4-DDE	1.0E-13	6.7E-11	2.7E-10	1.9E-09	1.0E-13	6.7E-11	3.7E-11	1.8E-10	1.0E-13	6.7E-11	2.7E-10	1.9E-09	1.0E-13	6.7E-11	3.7E-11	1.8E-10
Polychlorinated Biphenyls																
Total PCBs	8.1E-12	9.2E-09	6.4E-08	1.5E-07	8.1E-12	9.2E-09	8.7E-09	1.4E-08	7.1E-12	9.2E-09	5.6E-08	1.3E-07	7.1E-12	9.2E-09	7.6E-09	1.2E-08
Total Petroleum Hydrocarbons																
TPH as diesel	2.7E-08	3.4E-03	1.4E-04	4.9E-04	2.7E-08	3.4E-03	1.9E-05	4.6E-05	1.8E-08	3.4E-03	9.4E-05	3.2E-04	1.8E-08	3.4E-03	1.3E-05	3.0E-05
TPH as motor oil	6.0E-08	NV	3.2E-04	1.1E-03	6.0E-08	NV	4.3E-05	1.0E-04	4.1E-08	NV	2.1E-04	7.4E-04	4.1E-08	NV	2.9E-05	6.9E-05

Table AOC9-B1.2b
Baseline Scenario Exposure Concentration and Dose Calculations for Noncarcinogenic Effects for C O P Cs in AOC 9 Soil Using Depth-Weighted EPCs: Recreational User - Hiker

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)
Dioxins/Furans																
TEQ Human	3.3E-15	6.9E-12	5.2E-12	6.0E-11	3.3E-15	6.9E-12	7.1E-13	5.6E-12	2.4E-15	6.9E-12	3.7E-12	4.3E-11	2.4E-15	6.9E-12	5.1E-13	4.0E-12

Notes:
[a] EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
CDI = Chronic Daily Intake.
C O P C = Constituent of Potential Concern.
EC = Exposure Concentration.
mg/kg-day = milligrams per kilogram per day.
mg/m^3 = milligrams per cubic meter.
na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/ E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.
NA = Not applicable. Noncancer effects of carcinogenic polycyclic aromatic hydrocarbons (CPAHs) are evaluated separately for each chemical (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene).
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC9-B1.2c
Baseline Scenario Exposure Concentration and Dose Calculations for Noncarcinogenic Effects for C O P Cs in AOC 9 Soil Using Depth-Weighted EPCs:
Recreational User - Off-Highway Vehicle Rider

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Child OHV Rider (0 to 3 feet bgs)a Soil Pathway EC: Particulate Inhalation (mg/m^3)	Child OHV Rider (0 to 3 feet bgs)a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Child OHV Rider (0 to 3 feet bgs)a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child OHV Rider (0 to 3 feet bgs)a Soil Pathway CDI: Ingestion (mg/kg-day)	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)
Inorganics																
Antimony	4.9E-08	NV	4.6E-07	6.2E-07	4.9E-08	NV	4.0E-07	2.5E-07	3.3E-08	NV	3.2E-07	4.2E-07	3.3E-08	NV	2.7E-07	1.7E-07
Arsenic	1.8E-08	NV	5.0E-07	2.2E-07	1.8E-08	NV	4.3E-07	9.2E-08	1.7E-08	NV	4.9E-07	2.2E-07	1.7E-08	NV	4.2E-07	9.0E-08
Chromium, Hexavalent	1.0E-08	NV	NA	1.3E-07	1.0E-08	NV	NA	5.4E-08	5.4E-09	NV	NA	6.8E-08	5.4E-09	NV	NA	2.8E-08
Chromium, total	1.2E-07	NV	1.2E-06	1.6E-06	1.2E-07	NV	1.0E-06	6.4E-07	1.1E-07	NV	1.0E-06	1.3E-06	1.1E-07	NV	8.6E-07	5.5E-07
Copper	1.3E-07	NV	1.2E-06	1.6E-06	1.3E-07	NV	1.0E-06	6.6E-07	6.8E-08	NV	6.5E-07	8.7E-07	6.8E-08	NV	5.6E-07	3.6E-07
Lead	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	1.5E-08	NV	1.4E-07	1.9E-07	1.5E-08	NV	1.2E-07	7.9E-08	1.0E-08	NV	9.6E-08	1.3E-07	1.0E-08	NV	8.3E-08	5.3E-08
Nickel	5.2E-08	NV	4.9E-07	6.6E-07	5.2E-08	NV	4.2E-07	2.7E-07	5.1E-08	NV	4.8E-07	6.5E-07	5.1E-08	NV	4.2E-07	2.7E-07
Thallium	ND	NV	ND	ND	ND	NV	ND	ND	4.9E-09	NV	4.7E-08	6.2E-08	4.9E-09	NV	4.0E-08	2.6E-08
Zinc	8.9E-07	NV	8.5E-06	1.1E-05	8.9E-07	NV	7.3E-06	4.7E-06	8.5E-07	NV	8.1E-06	1.1E-05	8.5E-07	NV	6.9E-06	4.4E-06
Volatile Organic Compounds																
Isophorone	9.1E-09	NV	8.6E-07	1.2E-07	9.1E-09	NV	7.4E-07	4.7E-08	9.3E-08	NV	8.8E-06	1.2E-06	9.3E-08	NV	7.6E-06	4.8E-07
Polycyclic Aromatic Hydrocarbons																
1-Methyl naphthalene	5.2E-10	1.1E-09	7.4E-08	6.6E-09	5.2E-10	1.1E-09	6.3E-08	2.7E-09	8.1E-11	1.1E-09	1.2E-08	1.0E-09	8.1E-11	1.1E-09	1.0E-08	4.3E-10
2-Methyl naphthalene	3.9E-10	1.1E-09	5.5E-08	4.9E-09	3.9E-10	1.1E-09	4.8E-08	2.0E-09	1.9E-11	1.1E-09	2.7E-09	2.4E-10	1.9E-11	1.1E-09	2.3E-09	9.8E-11
Acenaphthene	2.7E-11	5.2E-11	3.9E-09	3.5E-10	2.7E-11	5.2E-11	3.4E-09	1.4E-10	1.0E-11	5.2E-11	1.4E-09	1.3E-10	1.0E-11	5.2E-11	1.2E-09	5.3E-11
Acenaphthylene	8.4E-11	NV	1.2E-08	1.1E-09	8.4E-11	NV	1.0E-08	4.4E-10	5.9E-11	NV	8.4E-09	7.5E-10	5.9E-11	NV	7.2E-09	3.1E-10
Anthracene	5.3E-11	8.1E-11	7.5E-09	6.7E-10	5.3E-11	8.1E-11	6.5E-09	2.8E-10	4.4E-11	8.1E-11	6.2E-09	5.5E-10	4.4E-11	8.1E-11	5.4E-09	2.3E-10
Benzo (a) anthracene	8.9E-10	8.5E-11	1.3E-07	1.1E-08	8.9E-10	8.5E-11	1.1E-07	4.7E-09	7.1E-10	8.5E-11	1.0E-07	9.0E-09	7.1E-10	8.5E-11	8.6E-08	3.7E-09
Benzo (a) pyrene	2.4E-09	NV	3.5E-07	3.1E-08	2.4E-09	NV	3.0E-07	1.3E-08	1.7E-09	NV	2.4E-07	2.1E-08	1.7E-09	NV	2.1E-07	8.9E-09
Benzo (b) fluoranthene	7.2E-09	NV	1.0E-06	9.1E-08	7.2E-09	NV	8.8E-07	3.8E-08	4.9E-09	NV	7.0E-07	6.2E-08	4.9E-09	NV	6.0E-07	2.6E-08
Benzo (ghi) perylene	9.3E-10	NV	1.3E-07	1.2E-08	9.3E-10	NV	1.1E-07	4.8E-09	8.0E-10	NV	1.1E-07	1.0E-08	8.0E-10	NV	9.8E-08	4.2E-09
Benzo (k) fluoranthene	2.8E-09	NV	4.0E-07	3.5E-08	2.8E-09	NV	3.4E-07	1.5E-08	1.9E-09	NV	2.7E-07	2.4E-08	1.9E-09	NV	2.3E-07	9.9E-09
Chrysene	2.9E-09	NV	4.1E-07	3.6E-08	2.9E-09	NV	3.5E-07	1.5E-08	2.0E-09	NV	2.8E-07	2.5E-08	2.0E-09	NV	2.4E-07	1.0E-08
Dibenzo (a,h) anthracene	1.7E-10	NV	2.4E-08	2.1E-09	1.7E-10	NV	2.0E-08	8.7E-10	1.7E-10	NV	2.4E-08	2.1E-09	1.7E-10	NV	2.0E-08	8.7E-10
Fluoranthene	1.9E-09	NV	2.7E-07	2.4E-08	1.9E-09	NV	2.3E-07	9.9E-09	1.4E-09	NV	2.1E-07	1.8E-08	1.4E-09	NV	1.8E-07	7.5E-09
Fluorene	3.2E-11	3.6E-11	4.5E-09	4.0E-10	3.2E-11	3.6E-11	3.9E-09	1.7E-10	2.4E-11	3.6E-11	3.4E-09	3.0E-10	2.4E-11	3.6E-11	2.9E-09	1.3E-10
Indeno (1,2,3-cd) pyrene	8.1E-10	NV	1.2E-07	1.0E-08	8.1E-10	NV	9.9E-08	4.2E-09	3.0E-10	NV	4.3E-08	3.8E-09	3.0E-10	NV	3.6E-08	1.6E-09
Naphthalene	5.2E-11	2.2E-10	7.4E-09	6.6E-10	5.2E-11	2.2E-10	6.3E-09	2.7E-10	1.4E-11	2.2E-10	2.0E-09	1.8E-10	1.4E-11	2.2E-10	1.7E-09	7.3E-11
Phenanthrene	3.7E-10	NV	5.3E-08	4.7E-09	3.7E-10	NV	4.5E-08	1.9E-09	3.6E-10	NV	5.1E-08	4.6E-09	3.6E-10	NV	4.4E-08	1.9E-09
Pyrene	1.9E-09	2.8E-10	2.7E-07	2.4E-08	1.9E-09	2.8E-10	2.3E-07	9.7E-09	1.4E-09	2.8E-10	2.0E-07	1.8E-08	1.4E-09	2.8E-10	1.7E-07	7.4E-09
B(a)P Equivalent	NA	NV	NA	NA	NA	NV	NA	NA	NA	NV	NA	NA	NA	NV	NA	NA
Pesticides																
4,4-DDE	1.0E-11	4.2E-12	4.9E-10	1.3E-10	1.0E-11	4.2E-12	4.2E-10	5.4E-11	1.0E-11	4.2E-12	4.9E-10	1.3E-10	1.0E-11	4.2E-12	4.2E-10	5.4E-11
Polychlorinated Biphenyls																
Total PCBs	8.1E-10	5.7E-10	1.2E-07	1.0E-08	8.1E-10	5.7E-10	9.9E-08	4.2E-09	7.1E-10	5.7E-10	1.0E-07	9.0E-09	7.1E-10	5.7E-10	8.7E-08	3.7E-09
Total Petroleum Hydrocarbons																
TPH as diesel	2.7E-06	2.1E-04	2.6E-04	3.4E-05	2.7E-06	2.1E-04	2.2E-04	1.4E-05	1.8E-06	2.1E-04	1.7E-04	2.3E-05	1.8E-06	2.1E-04	1.5E-04	9.4E-06
TPH as motor oil	6.0E-06	NV	5.8E-04	7.7E-05	6.0E-06	NV	4.9E-04	3.2E-05	4.1E-06	NV	3.9E-04	5.2E-05	4.1E-06	NV	3.3E-04	2.1E-05

Table AOC9-B1.2c
Baseline Scenario Exposure Concentration and Dose Calculations for Noncarcinogenic Effects for C O P Cs in AOC 9 Soil Using Depth-Weighted EPCs:
Recreational User - Off-Highway Vehicle Rider

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Child OHV Rider (0 to 3 feet bgs)a Soil Pathway EC: Particulate Inhalation (mg/m^3)	Child OHV Rider (0 to 3 feet bgs)a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Child OHV Rider (0 to 3 feet bgs)a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child OHV Rider (0 to 3 feet bgs)a Soil Pathway CDI: Ingestion (mg/kg-day)	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)
Dioxins/Furans																
TEQ Human	3.3E-13	4.3E-13	9.5E-12	4.2E-12	3.3E-13	4.3E-13	8.1E-12	1.7E-12	2.4E-13	4.3E-13	6.8E-12	3.0E-12	2.4E-13	4.3E-13	5.8E-12	1.2E-12

Notes:
[a] EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
CDI = Chronic Daily Intake.
C O P C = Constituent of Potential Concern.
EC = Exposure Concentration.
mg/kg-day = milligrams per kilogram per day.
mg/m^3 = milligrams per cubic meter.
na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/ E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.
NA = Not applicable. Noncancer effects of carcinogenic polycyclic aromatic hydrocarbons (CPAHs) are evaluated separately for each chemical (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene).
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC9-B1.3a
Baseline Scenario ILCRs for C O P Cs in AOC 9 Soil Using Depth-Weighted EPCs: Recreational User- Camper

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Total Cancer Risk	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Total Cancer Risk
Inorganics										
Antimony	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Arsenic	1.4E-10	NV	1.6E-07	1.7E-06	1.9E-06	1.4E-10	NV	1.6E-07	1.7E-06	1.8E-06
Chromium, Hexavalent	7.9E-09	NV	NA	2.4E-07	2.5E-07	4.1E-09	NV	NA	1.2E-07	1.3E-07
Chromium, total	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Copper	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Lead	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Nickel	2.5E-11	NV	NC	NC	2.5E-11	2.4E-11	NV	NC	NC	2.4E-11
Thallium	ND	NC	ND	ND	--	NC	NC	NC	NC	--
Zinc	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Volatile Organic Compounds										
Isophorone	NC	NC	2.8E-11	8.7E-11	1.2E-10	NC	NC	2.9E-10	8.9E-10	1.2E-09
Polycyclic Aromatic Hydrocarbons										
1-Methyl naphthalene	1.2E-14	4.1E-11	1.3E-10	2.7E-10	4.4E-10	1.9E-15	4.1E-11	2.0E-11	4.2E-11	1.0E-10
2-Methyl naphthalene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Acenaphthene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Acenaphthylene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Anthracene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Benzo (a) anthracene	NA	7.7E-11	NA	NA	7.7E-11	NA	7.7E-11	NA	NA	7.7E-11
Benzo (a) pyrene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Benzo (b) fluoranthene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Benzo (ghi) perylene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Benzo (k) fluoranthene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Chrysene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Dibenzo (a,h) anthracene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Fluoranthene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Fluorene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Indeno (1,2,3-cd) pyrene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Naphthalene	3.3E-15	2.2E-11	3.0E-11	6.3E-11	1.2E-10	8.8E-16	2.2E-11	8.2E-12	1.7E-11	4.7E-11
Phenanthrene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Pyrene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
B(a)P Equivalent	2.4E-11	NV	9.0E-08	2.0E-07	2.9E-07	1.7E-11	NV	6.3E-08	1.4E-07	2.0E-07
Pesticides										
4,4-DDE	1.9E-15	1.2E-12	5.7E-12	3.6E-11	4.3E-11	1.9E-15	1.2E-12	5.7E-12	3.6E-11	4.3E-11

Table AOC9-B1.3a
Baseline Scenario ILCRs for C O P Cs in AOC 9 Soil Using Depth-Weighted EPCs: Recreational User- Camper

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Total Cancer Risk	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Total Cancer Risk
Polychlorinated Biphenyls										
Total PCBs	1.5E-13	1.7E-10	7.9E-09	1.6E-08	2.5E-08	1.3E-13	1.7E-10	6.9E-09	1.4E-08	2.2E-08
Total Petroleum Hydrocarbons										
TPH as diesel	NC	NC	NC	NC	--	NC	NC	NC	NC	--
TPH as motor oil	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Dioxins/Furans										
TEQ Human	2.3E-11	4.9E-08	4.2E-08	4.4E-07	5.3E-07	1.7E-11	4.9E-08	3.0E-08	3.1E-07	3.9E-07
Cumulative ILCR	**8E-09**	**5E-08**	**3E-07**	**3E-06**	**3E-06**	**4E-09**	**5E-08**	**3E-07**	**2E-06**	**3E-06**

Notes:
[a] EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
-- = not calculated.
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
C O P C = Constituent of Potential Concern.
mg/m^3 = milligrams per cubic meter.
na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/ E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.

NA = Not applicable. Carcinogenic polycyclic aromatic hydrocarbons (CPAHs) are evaluated using benzo(a)pyrene equivalents. Hexavalent chromium is not absorbed via dermal contact.
NC = Not considered a carcinogen.
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC9-B1.3b
Baseline Scenario ILCRs for C O P Cs in AOC 9 Soil Using Depth-Weighted EPCs: Recreational User - Hiker

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Total Cancer Risk	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Total Cancer Risk
Inorganics										
Antimony	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Arsenic	2.8E-10	NV	3.3E-07	3.4E-06	3.7E-06	2.7E-10	NV	3.2E-07	3.3E-06	3.6E-06
Chromium, Hexavalent	1.6E-08	NV	NA	4.8E-07	4.9E-07	8.2E-09	NV	NA	2.5E-07	2.6E-07
Chromium, total	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Copper	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Lead	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Nickel	5.0E-11	NV	NC	NC	5.0E-11	4.9E-11	NV	NC	NC	4.9E-11
Thallium	ND	NC	ND	ND	--	NC	NC	NC	NC	--
Zinc	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Volatile Organic Compounds										
Isophorone	NC	NC	5.6E-11	1.7E-10	2.3E-10	NC	NC	5.7E-10	1.8E-09	2.4E-09
Polycyclic Aromatic Hydrocarbons										
1-Methyl naphthalene	2.4E-14	8.2E-11	2.6E-10	5.4E-10	8.8E-10	3.8E-15	8.2E-11	4.1E-11	8.4E-11	2.1E-10
2-Methyl naphthalene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Acenaphthene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Acenaphthylene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Anthracene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Benzo (a) anthracene	NA	1.5E-10	NA	NA	1.5E-10	NA	1.5E-10	NA	NA	1.5E-10
Benzo (a) pyrene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Benzo (b) fluoranthene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Benzo (ghi) perylene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Benzo (k) fluoranthene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Chrysene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Dibenzo (a,h) anthracene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Fluoranthene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Fluorene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Indeno (1,2,3-cd) pyrene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Naphthalene	6.5E-15	4.4E-11	6.1E-11	1.3E-10	2.3E-10	1.8E-15	4.4E-11	1.6E-11	3.4E-11	9.5E-11
Phenanthrene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Pyrene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
B(a)P Equivalent	4.8E-11	NV	1.8E-07	3.9E-07	5.7E-07	3.4E-11	NV	1.3E-07	2.7E-07	4.0E-07
Pesticides										
4,4-DDE	3.7E-15	2.4E-12	1.1E-11	7.2E-11	8.5E-11	3.7E-15	2.4E-12	1.1E-11	7.2E-11	8.5E-11

Table AOC9-B1.3b
Baseline Scenario ILCRs for C O P Cs in AOC 9 Soil Using Depth-Weighted EPCs: Recreational User - Hiker

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Total Cancer Risk	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Total Cancer Risk
Polychlorinated Biphenyls										
Total PCBs	3.0E-13	3.4E-10	1.6E-08	3.3E-08	4.9E-08	2.6E-13	3.4E-10	1.4E-08	2.9E-08	4.3E-08
Total Petroleum Hydrocarbons										
TPH as diesel	NC	NC	NC	NC	--	NC	NC	NC	NC	--
TPH as motor oil	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Dioxins/Furans										
TEQ Human	4.7E-11	9.8E-08	8.5E-08	8.8E-07	1.1E-06	3.3E-11	9.8E-08	6.0E-08	6.3E-07	7.8E-07
Cumulative ILCR	**2E-08**	**1E-07**	**6E-07**	**5E-06**	**6E-06**	**9E-09**	**1E-07**	**5E-07**	**5E-06**	**5E-06**

Notes:
[a] EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
-- = not calculated.
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
C O P C = Constituent of Potential Concern.
mg/m^3 = milligrams per cubic meter.
na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/ E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.

NA = Not applicable. Carcinogenic polycyclic aromatic hydrocarbons (CPAHs) are evaluated using benzo(a)pyrene equivalents. Hexavalent chromium is not absorbed via dermal contact.
NC = Not considered a carcinogen.
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC9-B1.3c
Baseline Scenario ILCRs for C O P Cs in AOC 9 Soil Using Depth-Weighted EPCs: Recreational User - Off-Highway Vehicle Rider

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Total Cancer Risk	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Total Cancer Risk
Inorganics										
Antimony	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Arsenic	2.8E-08	NV	1.6E-06	4.3E-07	2.0E-06	2.7E-08	NV	1.5E-06	4.2E-07	2.0E-06
Chromium, Hexavalent	1.0E-06	NV	NA	2.8E-08	1.0E-06	5.3E-07	NV	NA	1.4E-08	5.4E-07
Chromium, total	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Copper	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Lead	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Nickel	5.0E-09	NV	NC	NC	5.0E-09	4.9E-09	NV	NC	NC	4.9E-09
Thallium	ND	NC	ND	ND	--	NC	NC	NC	NC	--
Zinc	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Volatile Organic Compounds										
Isophorone	NC	NC	2.7E-10	2.2E-11	2.9E-10	NC	NC	2.8E-09	2.3E-10	3.0E-09
Polycyclic Aromatic Hydrocarbons										
1-Methyl naphthalene	2.5E-12	5.1E-12	1.2E-09	6.8E-11	1.3E-09	3.8E-13	5.1E-12	2.0E-10	1.1E-11	2.1E-10
2-Methyl naphthalene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Acenaphthene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Acenaphthylene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Anthracene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Benzo (a) anthracene	NA	6.2E-12	NA	NA	6.2E-12	NA	6.2E-12	NA	NA	6.2E-12
Benzo (a) pyrene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Benzo (b) fluoranthene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Benzo (ghi) perylene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Benzo (k) fluoranthene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Chrysene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Dibenzo (a,h) anthracene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Fluoranthene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Fluorene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Indeno (1,2,3-cd) pyrene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Naphthalene	6.5E-13	2.8E-12	2.9E-10	1.6E-11	3.1E-10	1.8E-13	2.8E-12	7.9E-11	4.3E-12	8.7E-11
Phenanthrene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Pyrene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
B(a)P Equivalent	3.1E-09	NV	3.7E-07	2.3E-08	3.9E-07	2.2E-09	NV	2.6E-07	1.6E-08	2.7E-07
Pesticides										
4,4-DDE	3.7E-13	1.5E-13	5.5E-11	9.1E-12	6.5E-11	3.7E-13	1.5E-13	5.5E-11	9.1E-12	6.5E-11

Table AOC9-B1.3c
Baseline Scenario ILCRs for C O P Cs in AOC 9 Soil Using Depth-Weighted EPCs: Recreational User - Off-Highway Vehicle Rider

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Total Cancer Risk	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Total Cancer Risk
Polychlorinated Biphenyls										
Total PCBs	3.0E-11	2.1E-11	7.6E-08	4.2E-09	8.1E-08	2.6E-11	2.1E-11	6.7E-08	3.7E-09	7.1E-08
Total Petroleum Hydrocarbons										
TPH as diesel	NC	NC	NC	NC	--	NC	NC	NC	NC	--
TPH as motor oil	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Dioxins/Furans										
TEQ Human	4.7E-09	6.1E-09	4.1E-07	1.1E-07	5.3E-07	3.3E-09	6.1E-09	2.9E-07	8.0E-08	3.8E-07
Cumulative ILCR	**1E-06**	**6E-09**	**2E-06**	**6E-07**	**4E-06**	**6E-07**	**6E-09**	**2E-06**	**5E-07**	**3E-06**

Notes:
[a] EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
-- = not calculated.
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
C O P C = Constituent of Potential Concern.
mg/m^3 = milligrams per cubic meter.
na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/ E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.

NA = Not applicable. Carcinogenic polycyclic aromatic hydrocarbons (CPAHs) are evaluated using benzo(a)pyrene equivalents. Hexavalent chromium is not absorbed via dermal contact.
NC = Not considered a carcinogen.
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC9-B1.4a
Baseline Scenario HIs for C O P Cs in AOC 9 Soil Using Depth-Weighted EPCs: Recreational User - Camper

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway Total Hazard Index	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Total Hazard Index	Child Camper (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Child Camper (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Child Camper (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Child Camper (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Child Camper (0 to 3 feet bgs)[a] Soil Pathway Total Hazard Index	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Total Hazard Index
Inorganics																				
Antimony	8.1E-07	NV	3.2E-04	1.1E-02	1.1E-02	8.1E-07	NV	4.3E-05	1.0E-03	1.1E-03	5.5E-07	NV	2.2E-04	7.5E-03	7.7E-03	5.5E-07	NV	3.0E-05	7.1E-04	7.4E-04
Arsenic	5.9E-06	NV	4.0E-02	4.6E-01	4.9E-01	5.9E-06	NV	5.4E-03	4.3E-02	4.8E-02	5.7E-06	NV	3.9E-02	4.4E-01	4.8E-01	5.7E-06	NV	5.3E-03	4.2E-02	4.7E-02
Chromium, Hexavalent	5.2E-07	NV	NA	3.1E-04	3.1E-04	5.2E-07	NV	NA	2.9E-05	3.0E-05	2.7E-07	NV	NA	1.6E-04	1.6E-04	2.7E-07	NV	NA	1.5E-05	1.5E-05
Chromium, total	1.0E-05	NV	2.1E-07	7.4E-06	1.8E-05	1.0E-05	NV	2.9E-08	6.9E-07	1.1E-05	8.8E-06	NV	1.8E-07	6.4E-06	1.5E-05	8.8E-06	NV	2.5E-08	6.0E-07	9.4E-06
Copper	4.0E-09	NV	8.3E-06	2.9E-04	2.9E-04	4.0E-09	NV	1.1E-06	2.7E-05	2.8E-05	2.1E-09	NV	4.5E-06	1.5E-04	1.6E-04	2.1E-09	NV	6.1E-07	1.4E-05	1.5E-05
Iron	2E-07	NV	NA	1E-02	1E-02	2E-07	NV	NA	1E-03	1E-03	2E-07	NV	NA	1E-02	1E-02	2E-07	NV	NA	1E-03	1E-03
Lead	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	2.5E-06	NV	2.5E-04	8.5E-03	8.8E-03	2.5E-06	NV	3.4E-05	8.0E-04	8.4E-04	1.7E-06	NV	1.7E-04	5.7E-03	5.9E-03	1.7E-06	NV	2.3E-05	5.4E-04	5.6E-04
Nickel	1.8E-05	NV	1.2E-05	4.3E-04	4.6E-04	1.8E-05	NV	1.7E-06	4.0E-05	6.0E-05	1.8E-05	NV	1.2E-05	4.2E-04	4.5E-04	1.8E-05	NV	1.7E-06	3.9E-05	5.9E-05
Thallium	ND	NV	ND	ND	--	ND	NV	ND	ND	--	6.1E-07	NV	1.3E-03	4.4E-02	4.6E-02	6.1E-07	NV	1.8E-04	4.2E-03	4.3E-03
Zinc	3.7E-09	NV	7.8E-06	2.7E-04	2.8E-04	3.7E-09	NV	1.1E-06	2.5E-05	2.6E-05	3.5E-09	NV	7.4E-06	2.6E-04	2.6E-04	3.5E-09	NV	1.0E-06	2.4E-05	2.5E-05
Volatile Organic Compounds																				
Isophorone	2.3E-11	NV	1.2E-06	4.1E-06	5.3E-06	2.3E-11	NV	1.6E-07	3.8E-07	5.5E-07	2.3E-10	NV	1.2E-05	4.2E-05	5.4E-05	2.3E-10	NV	1.7E-06	3.9E-06	5.6E-06
Polycyclic Aromatic Hydrocarbons																				
1-Methyl naphthalene	9.2E-12	3.1E-08	2.9E-07	6.7E-07	9.9E-07	9.2E-12	3.1E-08	4.0E-08	6.3E-08	1.3E-07	1.4E-12	3.1E-08	4.6E-08	1.0E-07	1.8E-07	1.4E-12	3.1E-08	6.2E-09	9.8E-09	4.7E-08
2-Methyl naphthalene	1.2E-10	5.5E-07	3.8E-06	8.8E-06	1.3E-05	1.2E-10	5.5E-07	5.2E-07	8.2E-07	1.9E-06	5.8E-12	5.5E-07	1.8E-07	4.2E-07	1.2E-06	5.8E-12	5.5E-07	2.5E-08	4.0E-08	6.1E-07
Acenaphthene	5.7E-13	1.7E-09	1.8E-08	4.1E-08	6.1E-08	5.7E-13	1.7E-09	2.5E-09	3.9E-09	8.1E-09	2.1E-13	1.7E-09	6.6E-09	1.5E-08	2.3E-08	2.1E-13	1.7E-09	9.0E-10	1.4E-09	4.0E-09
Acenaphthylene	1.7E-12	NV	5.5E-08	1.3E-07	1.8E-07	1.7E-12	NV	7.5E-09	1.2E-08	1.9E-08	1.2E-12	NV	3.9E-08	8.9E-08	1.3E-07	1.2E-12	NV	5.3E-09	8.3E-09	1.4E-08
Anthracene	2.2E-13	5.4E-10	6.9E-09	1.6E-08	2.3E-08	2.2E-13	5.4E-10	9.4E-10	1.5E-09	3.0E-09	1.8E-13	5.4E-10	5.7E-09	1.3E-08	1.9E-08	1.8E-13	5.4E-10	7.8E-10	1.2E-09	2.6E-09
Benzo (a) anthracene	3.7E-11	5.7E-09	1.2E-06	2.7E-06	3.9E-06	3.7E-11	5.7E-09	1.6E-07	2.5E-07	4.2E-07	2.9E-11	5.7E-09	9.2E-07	2.1E-06	3.1E-06	2.9E-11	5.7E-09	1.3E-07	2.0E-07	3.3E-07
Benzo (a) pyrene	6.0E-06	NV	3.2E-04	7.3E-04	1.1E-03	6.0E-06	NV	4.3E-05	6.8E-05	1.2E-04	4.2E-06	NV	2.2E-04	5.1E-04	7.4E-04	4.2E-06	NV	3.0E-05	4.8E-05	8.2E-05
Benzo (b) fluoranthene	3.0E-10	NV	9.4E-06	2.2E-05	3.1E-05	3.0E-10	NV	1.3E-06	2.0E-06	3.3E-06	2.0E-10	NV	6.4E-06	1.5E-05	2.1E-05	2.0E-10	NV	8.8E-07	1.4E-06	2.3E-06
Benzo (ghi) perylene	3.8E-11	NV	1.2E-06	2.8E-06	4.0E-06	3.8E-11	NV	1.7E-07	2.6E-07	4.3E-07	3.3E-11	NV	1.0E-06	2.4E-06	3.4E-06	3.3E-11	NV	1.4E-07	2.2E-07	3.7E-07
Benzo (k) fluoranthene	1.1E-10	NV	3.6E-06	8.3E-06	1.2E-05	1.1E-10	NV	5.0E-07	7.8E-07	1.3E-06	7.8E-11	NV	2.5E-06	5.7E-06	8.2E-06	7.8E-11	NV	3.4E-07	5.3E-07	8.7E-07
Chrysene	1.2E-10	NV	3.7E-06	8.6E-06	1.2E-05	1.2E-10	NV	5.1E-07	8.1E-07	1.3E-06	8.2E-11	NV	2.6E-06	6.0E-06	8.6E-06	8.2E-11	NV	3.6E-07	5.6E-07	9.2E-07
Dibenzo (a,h) anthracene	4.2E-07	NV	2.2E-05	5.0E-05	7.3E-05	4.2E-07	NV	3.0E-06	4.7E-06	8.1E-06	4.1E-07	NV	2.2E-05	5.0E-05	7.2E-05	4.1E-07	NV	3.0E-06	4.7E-06	8.1E-06
Fluoranthene	5.9E-11	NV	1.9E-06	4.3E-06	6.1E-06	5.9E-11	NV	2.5E-07	4.0E-07	6.5E-07	4.5E-11	NV	1.4E-06	3.3E-06	4.7E-06	4.5E-11	NV	1.9E-07	3.0E-07	5.0E-07
Fluorene	9.9E-13	1.8E-09	3.1E-08	7.2E-08	1.0E-07	9.9E-13	1.8E-09	4.3E-09	6.7E-09	1.3E-08	7.5E-13	1.8E-09	2.4E-08	5.4E-08	7.9E-08	7.5E-13	1.8E-09	3.2E-09	5.1E-09	1.0E-08
Indeno (1,2,3-cd) pyrene	3.3E-11	NV	1.1E-06	2.4E-06	3.5E-06	3.3E-11	NV	1.4E-07	2.3E-07	3.7E-07	1.2E-11	NV	3.9E-07	9.0E-07	1.3E-06	1.2E-11	NV	5.3E-08	8.4E-08	1.4E-07
Naphthalene	8.6E-11	5.8E-07	1.0E-07	2.3E-07	9.2E-07	8.6E-11	5.8E-07	1.4E-08	2.2E-08	6.2E-07	2.3E-11	5.8E-07	2.7E-08	6.3E-08	6.7E-07	2.3E-11	5.8E-07	3.7E-09	5.9E-09	5.9E-07
Phenanthrene	1.5E-12	NV	4.8E-08	1.1E-07	1.6E-07	1.5E-12	NV	6.6E-09	1.0E-08	1.7E-08	1.5E-12	NV	4.7E-08	1.1E-07	1.6E-07	1.5E-12	NV	6.4E-09	1.0E-08	1.7E-08
Pyrene	7.7E-11	1.9E-08	2.4E-06	5.6E-06	8.0E-06	7.7E-11	1.9E-08	3.3E-07	5.2E-07	8.8E-07	5.8E-11	1.9E-08	1.8E-06	4.2E-06	6.1E-06	5.8E-11	1.9E-08	2.5E-07	4.0E-07	6.7E-07
B(a)P Equivalent	NA	NV	NA	NA	--	NA	NV	NA	NA	--	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Pesticides																				
4,4-DDE	2.6E-11	1.7E-08	2.7E-07	1.9E-06	2.2E-06	2.6E-11	1.7E-08	3.7E-08	1.8E-07	2.3E-07	2.6E-11	1.7E-08	2.7E-07	1.9E-06	2.2E-06	2.6E-11	1.7E-08	3.7E-08	1.8E-07	2.3E-07
Polychlorinated Biphenyls																				
Total PCBs	5.0E-08	5.7E-05	1.6E-03	3.7E-03	5.3E-03	5.0E-08	5.7E-05	2.2E-04	3.4E-04	6.2E-04	4.4E-08	5.7E-05	1.4E-03	3.2E-03	4.6E-03	4.4E-08	5.7E-05	1.9E-04	3.0E-04	5.5E-04
Total Petroleum Hydrocarbons																				
TPH as diesel	5.2E-08	6.5E-03	3.7E-03	1.3E-02	2.3E-02	5.2E-08	6.5E-03	5.1E-04	1.2E-03	8.2E-03	3.4E-08	6.5E-03	2.5E-03	8.5E-03	1.7E-02	3.4E-08	6.5E-03	3.4E-04	8.0E-04	7.6E-03
TPH as motor oil	5.0E-08	NV	1.1E-03	3.6E-03	4.7E-03	5.0E-08	NV	1.4E-04	3.4E-04	4.9E-04	3.4E-08	NV	7.1E-04	2.5E-03	3.2E-03	3.4E-08	NV	9.7E-05	2.3E-04	3.3E-04

Table AOC9-B1.4a
Baseline Scenario HIs for C O P Cs in AOC 9 Soil Using Depth-Weighted EPCs: Recreational User - Camper

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway Total Hazard Index	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Total Hazard Index	Child Camper (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Child Camper (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Child Camper (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Child Camper (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Child Camper (0 to 3 feet bgs)[a] Soil Pathway Total Hazard Index	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Total Hazard Index
Dioxins/Furans																				
TEQ Human	4.1E-08	8.7E-05	3.7E-03	4.3E-02	4.7E-02	4.1E-08	8.7E-05	5.1E-04	4.0E-03	4.6E-03	3.0E-08	8.7E-05	2.7E-03	3.1E-02	3.3E-02	3.0E-08	8.7E-05	3.6E-04	2.9E-03	3.3E-03
Total Hazard Index	**5E-05**	**7E-03**	**5E-02**	**6E-01**	**6E-01**	**5E-05**	**7E-03**	**7E-03**	**5E-02**	**7E-02**	**4E-05**	**7E-03**	**5E-02**	**6E-01**	**6E-01**	**4E-05**	**7E-03**	**7E-03**	**5E-02**	**7E-02**

Notes:
[a] EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
-- = not calculated.
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
C O P C = Constituent of Potential Concern.
H I = Hazard Index
na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/ E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.
NA = Not applicable. Noncancer effects of carcinogenic polycyclic aromatic hydrocarbons (CPAHs) are evaluated separately for each chemical (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene). Hexavalent chromium is not absorbed via dermal contact.
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC9-B1.4b
Baseline Scenario HIs for C O P Cs in AOC 9 Soil Using Depth-Weighted EPCs: Recreational User - Hiker

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

COPC	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Total Hazard Index	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Total Hazard Index	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway Total Hazard Index	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Total Hazard Index
Inorganics																				
Antimony	1.6E-06	NV	6.4E-04	2.2E-02	2.3E-02	1.6E-06	NV	8.7E-05	2.1E-03	2.1E-03	1.1E-06	NV	4.4E-04	1.5E-02	1.5E-02	1.1E-06	NV	6.0E-05	1.4E-03	1.5E-03
Arsenic	1.2E-05	NV	7.9E-02	9.1E-01	9.9E-01	1.2E-05	NV	1.1E-02	8.5E-02	9.6E-02	1.1E-05	NV	7.7E-02	8.9E-01	9.7E-01	1.1E-05	NV	1.1E-02	8.3E-02	9.4E-02
Chromium, Hexavalent	1.0E-06	NV	NA	6.2E-04	6.2E-04	1.0E-06	NV	NA	5.8E-05	5.9E-05	5.3E-07	NV	NA	3.2E-04	3.2E-04	5.3E-07	NV	NA	3.0E-05	3.1E-05
Chromium, total	2.0E-05	NV	4.3E-07	1.5E-05	3.5E-05	2.0E-05	NV	5.8E-08	1.4E-06	2.2E-05	1.8E-05	NV	3.7E-07	1.3E-05	3.1E-05	1.8E-05	NV	5.0E-08	1.2E-06	1.9E-05
Copper	7.9E-09	NV	1.7E-05	5.7E-04	5.9E-04	7.9E-09	NV	2.3E-06	5.4E-05	5.6E-05	4.2E-09	NV	8.9E-06	3.1E-04	3.2E-04	4.2E-09	NV	1.2E-06	2.9E-05	3.0E-05
Iron	4E-07	NV	NA	3E-02	3E-02	4E-07	NV	NA	3E-03	3E-03	4E-07	NV	NA	3E-02	3E-02	4E-07	NV	NA	3E-03	3E-03
Lead	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	5.0E-06	NV	4.9E-04	1.7E-02	1.8E-02	5.0E-06	NV	6.8E-05	1.6E-03	1.7E-03	3.4E-06	NV	3.3E-04	1.1E-02	1.2E-02	3.4E-06	NV	4.5E-05	1.1E-03	1.1E-03
Nickel	3.7E-05	NV	2.5E-05	8.5E-04	9.1E-04	3.7E-05	NV	3.4E-06	8.0E-05	1.2E-04	3.6E-05	NV	2.4E-05	8.3E-04	8.9E-04	3.6E-05	NV	3.3E-06	7.8E-05	1.2E-04
Thallium	ND	NV	ND	ND	--	ND	NV	ND	ND	--	1.2E-06	NV	2.6E-03	8.9E-02	9.1E-02	1.2E-06	NV	3.5E-04	8.3E-03	8.7E-03
Zinc	7.4E-09	NV	1.6E-05	5.4E-04	5.5E-04	7.4E-09	NV	2.1E-06	5.0E-05	5.3E-05	7.0E-09	NV	1.5E-05	5.1E-04	5.3E-04	7.0E-09	NV	2.0E-06	4.8E-05	5.0E-05
Volatile Organic Compounds																				
Isophorone	4.5E-11	NV	2.4E-06	8.2E-06	1.1E-05	4.5E-11	NV	3.2E-07	7.7E-07	1.1E-06	4.6E-10	NV	2.4E-05	8.4E-05	1.1E-04	4.6E-10	NV	3.3E-06	7.8E-06	1.1E-05
Polycyclic Aromatic Hydrocarbons																				
1-Methyl naphthalene	1.8E-11	6.2E-08	5.8E-07	1.3E-06	2.0E-06	1.8E-11	6.2E-08	7.9E-08	1.3E-07	2.7E-07	2.9E-12	6.2E-08	9.1E-08	2.1E-07	3.6E-07	2.9E-12	6.2E-08	1.2E-08	2.0E-08	9.4E-08
2-Methyl naphthalene	2.4E-10	1.1E-06	7.6E-06	1.8E-05	2.6E-05	2.4E-10	1.1E-06	1.0E-06	1.6E-06	3.8E-06	1.2E-11	1.1E-06	3.7E-07	8.5E-07	2.3E-06	1.2E-11	1.1E-06	5.0E-08	7.9E-08	1.2E-06
Acenaphthene	1.1E-12	3.5E-09	3.6E-08	8.3E-08	1.2E-07	1.1E-12	3.5E-09	4.9E-09	7.8E-09	1.6E-08	4.2E-13	3.5E-09	1.3E-08	3.0E-08	4.7E-08	4.2E-13	3.5E-09	1.8E-09	2.8E-09	8.1E-09
Acenaphthylene	3.5E-12	NV	1.1E-07	2.5E-07	3.6E-07	3.5E-12	NV	1.5E-08	2.4E-08	3.9E-08	2.4E-12	NV	7.7E-08	1.8E-07	2.5E-07	2.4E-12	NV	1.1E-08	1.7E-08	2.7E-08
Anthracene	4.4E-13	1.1E-09	1.4E-08	3.2E-08	4.7E-08	4.4E-13	1.1E-09	1.9E-09	3.0E-09	5.9E-09	3.6E-13	1.1E-09	1.1E-08	2.6E-08	3.9E-08	3.6E-13	1.1E-09	1.6E-09	2.5E-09	5.1E-09
Benzo (a) anthracene	7.4E-11	1.1E-08	2.3E-06	5.4E-06	7.7E-06	7.4E-11	1.1E-08	3.2E-07	5.0E-07	8.3E-07	5.9E-11	1.1E-08	1.8E-06	4.2E-06	6.1E-06	5.9E-11	1.1E-08	2.5E-07	4.0E-07	6.6E-07
Benzo (a) pyrene	1.2E-05	NV	6.3E-04	1.5E-03	2.1E-03	1.2E-05	NV	8.6E-05	1.4E-04	2.3E-04	8.4E-06	NV	4.4E-04	1.0E-03	1.5E-03	8.4E-06	NV	6.1E-05	9.6E-05	1.6E-04
Benzo (b) fluoranthene	6.0E-10	NV	1.9E-05	4.3E-05	6.2E-05	6.0E-10	NV	2.6E-06	4.1E-06	6.6E-06	4.1E-10	NV	1.3E-05	3.0E-05	4.2E-05	4.1E-10	NV	1.8E-06	2.8E-06	4.5E-06
Benzo (ghi) perylene	7.7E-11	NV	2.4E-06	5.6E-06	8.0E-06	7.7E-11	NV	3.3E-07	5.2E-07	8.5E-07	6.6E-11	NV	2.1E-06	4.8E-06	6.9E-06	6.6E-11	NV	2.8E-07	4.5E-07	7.3E-07
Benzo (k) fluoranthene	2.3E-10	NV	7.3E-06	1.7E-05	2.4E-05	2.3E-10	NV	9.9E-07	1.6E-06	2.6E-06	1.6E-10	NV	4.9E-06	1.1E-05	1.6E-05	1.6E-10	NV	6.8E-07	1.1E-06	1.7E-06
Chrysene	2.4E-10	NV	7.5E-06	1.7E-05	2.5E-05	2.4E-10	NV	1.0E-06	1.6E-06	2.6E-06	1.6E-10	NV	5.2E-06	1.2E-05	1.7E-05	1.6E-10	NV	7.1E-07	1.1E-06	1.8E-06
Dibenzo (a,h) anthracene	8.3E-07	NV	4.4E-05	1.0E-04	1.5E-04	8.3E-07	NV	6.0E-06	9.4E-06	1.6E-05	8.3E-07	NV	4.4E-05	1.0E-04	1.4E-04	8.3E-07	NV	5.9E-06	9.4E-06	1.6E-05
Fluoranthene	1.2E-10	NV	3.7E-06	8.5E-06	1.2E-05	1.2E-10	NV	5.1E-07	8.0E-07	1.3E-06	9.0E-11	NV	2.8E-06	6.5E-06	9.3E-06	9.0E-11	NV	3.9E-07	6.1E-07	1.0E-06
Fluorene	2.0E-12	3.6E-09	6.2E-08	1.4E-07	2.1E-07	2.0E-12	3.6E-09	8.5E-09	1.3E-08	2.6E-08	1.5E-12	3.6E-09	4.7E-08	1.1E-07	1.6E-07	1.5E-12	3.6E-09	6.4E-09	1.0E-08	2.0E-08
Indeno (1,2,3-cd) pyrene	6.7E-11	NV	2.1E-06	4.9E-06	7.0E-06	6.7E-11	NV	2.9E-07	4.5E-07	7.4E-07	2.5E-11	NV	7.8E-07	1.8E-06	2.6E-06	2.5E-11	NV	1.1E-07	1.7E-07	2.7E-07
Naphthalene	1.7E-10	1.2E-06	2.0E-07	4.7E-07	1.8E-06	1.7E-10	1.2E-06	2.8E-08	4.4E-08	1.2E-06	4.6E-11	1.2E-06	5.5E-08	1.3E-07	1.3E-06	4.6E-11	1.2E-06	7.5E-09	1.2E-08	1.2E-06
Phenanthrene	3.1E-12	NV	9.7E-08	2.2E-07	3.2E-07	3.1E-12	NV	1.3E-08	2.1E-08	3.4E-08	3.0E-12	NV	9.4E-08	2.2E-07	3.1E-07	3.0E-12	NV	1.3E-08	2.0E-08	3.3E-08
Pyrene	1.5E-10	3.7E-08	4.9E-06	1.1E-05	1.6E-05	1.5E-10	3.7E-08	6.6E-07	1.0E-06	1.8E-06	1.2E-10	3.7E-08	3.7E-06	8.5E-06	1.2E-05	1.2E-10	3.7E-08	5.0E-07	7.9E-07	1.3E-06
B(a)P Equivalent	NA	NV	NA	NA	--	NA	NV	NA	NA	--	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Pesticides																				
4,4-DDE	5.2E-11	3.4E-08	5.4E-07	3.7E-06	4.3E-06	5.2E-11	3.4E-08	7.4E-08	3.5E-07	4.6E-07	5.2E-11	3.4E-08	5.4E-07	3.7E-06	4.3E-06	5.2E-11	3.4E-08	7.4E-08	3.5E-07	4.6E-07
Polychlorinated Biphenyls																				
Total PCBs	1.0E-07	1.1E-04	3.2E-03	7.3E-03	1.1E-02	1.0E-07	1.1E-04	4.3E-04	6.8E-04	1.2E-03	8.8E-08	1.1E-04	2.8E-03	6.4E-03	9.3E-03	8.8E-08	1.1E-04	3.8E-04	6.0E-04	1.1E-03
Total Petroleum Hydrocarbons																				
TPH as diesel	1.0E-07	1.3E-02	7.5E-03	2.6E-02	4.6E-02	1.0E-07	1.3E-02	1.0E-03	2.4E-03	1.6E-02	6.9E-08	1.3E-02	4.9E-03	1.7E-02	3.5E-02	6.9E-08	1.3E-02	6.7E-04	1.6E-03	1.5E-02
TPH as motor oil	1.0E-07	NV	2.1E-03	7.3E-03	9.4E-03	1.0E-07	NV	2.9E-04	6.8E-04	9.7E-04	6.8E-08	NV	1.4E-03	4.9E-03	6.4E-03	6.8E-08	NV	1.9E-04	4.6E-04	6.6E-04

Table AOC9-B1.4b
Baseline Scenario HIs for C O P Cs in AOC 9 Soil Using Depth-Weighted EPCs: Recreational User - Hiker

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Total Hazard Index	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Total Hazard Index	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway Total Hazard Index	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Total Hazard Index
Dioxins/Furans																				
TEQ Human	8.3E-08	1.7E-04	7.5E-03	8.6E-02	9.3E-02	8.3E-08	1.7E-04	1.0E-03	8.0E-03	9.2E-03	5.9E-08	1.7E-04	5.3E-03	6.1E-02	6.7E-02	5.9E-08	1.7E-04	7.3E-04	5.7E-03	6.6E-03
Total Hazard Index	**9E-05**	**1E-02**	**1E-01**	**1E+00**	**1E+00**	**9E-05**	**1E-02**	**1E-02**	**1E-01**	**1E-01**	**8E-05**	**1E-02**	**1E-01**	**1E+00**	**1E+00**	**8E-05**	**1E-02**	**1E-02**	**1E-01**	**1E-01**

Notes:
[a] EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
-- = not calculated.
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
C O P C = Constituent of Potential Concern.
H I = Hazard Index
na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/ E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.
NA = Not applicable. Noncancer effects of carcinogenic polycyclic aromatic hydrocarbons (CPAHs) are evaluated separately for each chemical (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene). Hexavalent chromium is not absorbed via dermal contact.
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC9-B1.4c
Baseline Scenario HIs for C O P Cs in AOC 9 Soil Using Depth-Weighted EPCs: Recreational User - Off-Highway Vehicle Rider

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

COPC	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Total Hazard Index	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Total Hazard Index	Child OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Child OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Child OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Child OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Child OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Total Hazard Index	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Total Hazard Index
Inorganics																					
Antimony	1.6E-04	NV	1.2E-03	1.5E-03	2.9E-03	1.6E-04	NV	9.9E-04	6.4E-04	1.8E-03	1.1E-04	NV	7.9E-04	1.1E-03	2.0E-03	1.1E-04	NV	6.8E-04	4.4E-04	1.2E-03
Arsenic	1.2E-03	NV	1.4E-01	6.4E-02	2.1E-01	1.2E-03	NV	1.2E-01	2.6E-02	1.5E-01	1.1E-03	NV	1.4E-01	6.2E-02	2.0E-01	1.1E-03	NV	1.2E-01	2.6E-02	1.5E-01
Chromium, Hexavalent	1.0E-04	NV	NA	4.4E-05	1.5E-04	1.0E-04	NV	NA	1.8E-05	1.2E-04	5.4E-05	NV	NA	2.3E-05	7.6E-05	5.4E-05	NV	NA	9.4E-06	6.3E-05
Chromium, total	2.0E-03	NV	7.8E-07	1.0E-06	2.0E-03	2.0E-03	NV	6.7E-07	4.3E-07	2.0E-03	1.8E-03	NV	6.7E-07	8.9E-07	1.8E-03	1.8E-03	NV	5.8E-07	3.7E-07	1.8E-03
Copper	7.9E-07	NV	3.0E-05	4.0E-05	7.1E-05	7.9E-07	NV	2.6E-05	1.7E-05	4.3E-05	4.3E-07	NV	1.6E-05	2.2E-05	3.8E-05	4.3E-07	NV	1.4E-05	8.9E-06	2.3E-05
Iron	4E-05	NV	NA	2E-03	2E-03	4E-05	NV	NA	8E-04	8E-04	4E-05	NV	NA	2E-03	2E-03	4E-05	NV	NA	8E-04	8E-04
Lead	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	5.0E-04	NV	9.0E-04	1.2E-03	2.6E-03	5.0E-04	NV	7.7E-04	4.9E-04	1.8E-03	3.4E-04	NV	6.0E-04	8.0E-04	1.7E-03	3.4E-04	NV	5.2E-04	3.3E-04	1.2E-03
Nickel	3.7E-03	NV	4.5E-05	6.0E-05	3.8E-03	3.7E-03	NV	3.8E-05	2.5E-05	3.8E-03	3.6E-03	NV	4.4E-05	5.9E-05	3.7E-03	3.6E-03	NV	3.8E-05	2.4E-05	3.7E-03
Thallium	ND	NV	ND	ND	--	ND	NV	ND	ND	--	1.2E-04	NV	4.7E-03	6.2E-03	1.1E-02	1.2E-04	NV	4.0E-03	2.6E-03	6.7E-03
Zinc	7.4E-07	NV	2.8E-05	3.8E-05	6.7E-05	7.4E-07	NV	2.4E-05	1.6E-05	4.1E-05	7.1E-07	NV	2.7E-05	3.6E-05	6.4E-05	7.1E-07	NV	2.3E-05	1.5E-05	3.9E-05
Volatile Organic Compounds																				
Isophorone	4.5E-09	NV	4.3E-06	5.8E-07	4.9E-06	4.5E-09	NV	3.7E-06	2.4E-07	3.9E-06	4.6E-08	NV	4.4E-05	5.9E-06	5.0E-05	4.6E-08	NV	3.8E-05	2.4E-06	4.0E-05
Polycyclic Aromatic Hydrocarbons																				
1-Methyl naphthalene	1.8E-09	3.9E-09	1.1E-06	9.4E-08	1.2E-06	1.8E-09	3.9E-09	9.1E-07	3.9E-08	9.5E-07	2.9E-10	3.9E-09	1.7E-07	1.5E-08	1.8E-07	2.9E-10	3.9E-09	1.4E-07	6.1E-09	1.5E-07
2-Methyl naphthalene	2.4E-08	6.8E-08	1.4E-05	1.2E-06	1.5E-05	2.4E-08	6.8E-08	1.2E-05	5.1E-07	1.2E-05	1.2E-09	6.8E-08	6.7E-07	6.0E-08	8.0E-07	1.2E-09	6.8E-08	5.8E-07	2.5E-08	6.7E-07
Acenaphthene	1.1E-10	2.2E-10	6.5E-08	5.8E-09	7.2E-08	1.1E-10	2.2E-10	5.6E-08	2.4E-09	5.9E-08	4.2E-11	2.2E-10	2.4E-08	2.1E-09	2.6E-08	4.2E-11	2.2E-10	2.0E-08	8.8E-10	2.2E-08
Acenaphthylene	3.5E-10	NV	2.0E-07	1.8E-08	2.2E-07	3.5E-10	NV	1.7E-07	7.3E-09	1.8E-07	2.5E-10	NV	1.4E-07	1.2E-08	1.5E-07	2.5E-10	NV	1.2E-07	5.1E-09	1.3E-07
Anthracene	4.4E-11	6.7E-11	2.5E-08	2.2E-09	2.7E-08	4.4E-11	6.7E-11	2.2E-08	9.2E-10	2.3E-08	3.6E-11	6.7E-11	2.1E-08	1.8E-09	2.3E-08	3.6E-11	6.7E-11	1.8E-08	7.6E-10	1.9E-08
Benzo (a) anthracene	7.4E-09	7.1E-10	4.3E-06	3.8E-07	4.6E-06	7.4E-09	7.1E-10	3.6E-06	1.6E-07	3.8E-06	5.9E-09	7.1E-10	3.4E-06	3.0E-07	3.7E-06	5.9E-09	7.1E-10	2.9E-06	1.2E-07	3.0E-06
Benzo (a) pyrene	1.2E-03	NV	1.2E-03	1.0E-04	2.5E-03	1.2E-03	NV	9.9E-04	4.2E-05	2.2E-03	8.5E-04	NV	8.1E-04	7.2E-05	1.7E-03	8.5E-04	NV	6.9E-04	3.0E-05	1.6E-03
Benzo (b) fluoranthene	6.0E-08	NV	3.4E-05	3.0E-06	3.7E-05	6.0E-08	NV	2.9E-05	1.3E-06	3.1E-05	4.1E-08	NV	2.3E-05	2.1E-06	2.6E-05	4.1E-08	NV	2.0E-05	8.6E-07	2.1E-05
Benzo (ghi) perylene	7.7E-09	NV	4.4E-06	3.9E-07	4.8E-06	7.7E-09	NV	3.8E-06	1.6E-07	4.0E-06	6.6E-09	NV	3.8E-06	3.4E-07	4.1E-06	6.6E-09	NV	3.3E-06	1.4E-07	3.4E-06
Benzo (k) fluoranthene	2.3E-08	NV	1.3E-05	1.2E-06	1.4E-05	2.3E-08	NV	1.1E-05	4.8E-07	1.2E-05	1.6E-08	NV	9.0E-06	8.0E-07	9.8E-06	1.6E-08	NV	7.7E-06	3.3E-07	8.1E-06
Chrysene	2.4E-08	NV	1.4E-05	1.2E-06	1.5E-05	2.4E-08	NV	1.2E-05	5.0E-07	1.2E-05	1.7E-08	NV	9.5E-06	8.4E-07	1.0E-05	1.7E-08	NV	8.1E-06	3.5E-07	8.5E-06
Dibenzo (a,h) anthracene	8.3E-05	NV	8.0E-05	7.1E-06	1.7E-04	8.3E-05	NV	6.8E-05	2.9E-06	1.5E-04	8.3E-05	NV	7.9E-05	7.0E-06	1.7E-04	8.3E-05	NV	6.8E-05	2.9E-06	1.5E-04
Fluoranthene	1.2E-08	NV	6.7E-06	6.0E-07	7.4E-06	1.2E-08	NV	5.8E-06	2.5E-07	6.1E-06	9.0E-09	NV	5.1E-06	4.6E-07	5.6E-06	9.0E-09	NV	4.4E-06	1.9E-07	4.6E-06
Fluorene	2.0E-10	2.3E-10	1.1E-07	1.0E-08	1.2E-07	2.0E-10	2.3E-10	9.7E-08	4.2E-09	1.0E-07	1.5E-10	2.3E-10	8.6E-08	7.6E-09	9.3E-08	1.5E-10	2.3E-10	7.3E-08	3.1E-09	7.7E-08
Indeno (1,2,3-cd) pyrene	6.7E-09	NV	3.8E-06	3.4E-07	4.2E-06	6.7E-09	NV	3.3E-06	1.4E-07	3.4E-06	2.5E-09	NV	1.4E-06	1.3E-07	1.5E-06	2.5E-09	NV	1.2E-06	5.2E-08	1.3E-06
Naphthalene	1.7E-08	7.3E-08	3.7E-07	3.3E-08	4.9E-07	1.7E-08	7.3E-08	3.2E-07	1.4E-08	4.2E-07	4.7E-09	7.3E-08	1.0E-07	8.9E-09	1.9E-07	4.7E-09	7.3E-08	8.6E-08	3.7E-09	1.7E-07
Phenanthrene	3.1E-10	NV	1.8E-07	1.6E-08	1.9E-07	3.1E-10	NV	1.5E-07	6.4E-09	1.6E-07	3.0E-10	NV	1.7E-07	1.5E-08	1.9E-07	3.0E-10	NV	1.5E-07	6.3E-09	1.5E-07
Pyrene	1.5E-08	2.3E-09	8.8E-06	7.9E-07	9.6E-06	1.5E-08	2.3E-09	7.6E-06	3.2E-07	7.9E-06	1.2E-08	2.3E-09	6.7E-06	5.9E-07	7.3E-06	1.2E-08	2.3E-09	5.7E-06	2.5E-07	6.0E-06
B(a)P Equivalent	NA	NV	NA	NA	--	NA	NV	NA	NA	--	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Pesticides																				
4,4-DDE	5.2E-09	2.1E-09	9.9E-07	2.6E-07	1.3E-06	5.2E-09	2.1E-09	8.5E-07	1.1E-07	9.6E-07	5.2E-09	2.1E-09	9.9E-07	2.6E-07	1.3E-06	5.2E-09	2.1E-09	8.5E-07	1.1E-07	9.6E-07
Polychlorinated Biphenyls																				
Total PCBs	1.0E-05	7.2E-06	5.8E-03	5.1E-04	6.3E-03	1.0E-05	7.2E-06	5.0E-03	2.1E-04	5.2E-03	8.9E-06	7.2E-06	5.1E-03	4.5E-04	5.5E-03	8.9E-06	7.2E-06	4.3E-03	1.9E-04	4.5E-03
Total Petroleum Hydrocarbons																				
TPH as diesel	1.0E-05	8.1E-04	1.4E-02	1.8E-03	1.6E-02	1.0E-05	8.1E-04	1.2E-02	7.5E-04	1.3E-02	6.9E-06	8.1E-04	9.0E-03	1.2E-03	1.1E-02	6.9E-06	8.1E-04	7.7E-03	4.9E-04	9.0E-03
TPH as motor oil	1.0E-05	NV	3.8E-03	5.1E-04	4.4E-03	1.0E-05	NV	3.3E-03	2.1E-04	3.5E-03	6.8E-06	NV	2.6E-03	3.5E-04	3.0E-03	6.8E-06	NV	2.2E-03	1.4E-04	2.4E-03

Table AOC9-B1.4c
Baseline Scenario HIs for C O P Cs in AOC 9 Soil Using Depth-Weighted EPCs: Recreational User - Off-Highway Vehicle Rider

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Total Hazard Index	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Total Hazard Index	Child OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Child OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Child OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Child OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Child OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Total Hazard Index	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Total Hazard Index
Dioxins/Furans																				
TEQ Human	8.3E-06	1.1E-05	1.4E-02	6.0E-03	2.0E-02	8.3E-06	1.1E-05	1.2E-02	2.5E-03	1.4E-02	5.9E-06	1.1E-05	9.7E-03	4.3E-03	1.4E-02	5.9E-06	1.1E-05	8.3E-03	1.8E-03	1.0E-02
Total Hazard Index	**9E-03**	**8E-04**	**2E-01**	**8E-02**	**3E-01**	**9E-03**	**8E-04**	**2E-01**	**3E-02**	**2E-01**	**8E-03**	**8E-04**	**2E-01**	**8E-02**	**3E-01**	**8E-03**	**8E-04**	**1E-01**	**3E-02**	**2E-01**

Notes:
[a] EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
-- = not calculated.
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
C O P C = Constituent of Potential Concern.
H I = Hazard Index
na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/ E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.
NA = Not applicable. Noncancer effects of carcinogenic polycyclic aromatic hydrocarbons (CPAHs) are evaluated separately for each chemical (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene). Hexavalent chromium is not absorbed via dermal contact.
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC9-B1.5a

Baseline Scenario Risk Evaluation for Lead in AOC 9 Surface Soil (0 to 0.5 foot bgs) Using Depth-Weighted EPCs: Recreational User (Camper)

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

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INPUT MEDIUM	**INPUT** LEVEL
Lead in Soil/Dust (ug/g)	37.6
Respirable Dust (ug/m^3)	1.5

OUTPUT	Percentile Estimate of Blood Pb (ug/dl) 50th	Percentile Estimate of Blood Pb (ug/dl) 90th	Percentile Estimate of Blood Pb (ug/dl) 95th	Percentile Estimate of Blood Pb (ug/dl) 98th	Percentile Estimate of Blood Pb (ug/dl) 99th	PRG-90 (ug/g)
BLOOD Pb, CHILD	0.010	0.017	0.02	0.03	0.03	2159
BLOOD Pb, PICA CHILD	0.019	0.03	0.04	0.05	0.06	1084

EXPOSURE PARAMETERS	units	children
Days per week	days/wk	0.25 [a]
Geometric Standard Deviation	ug/dl	1.6
Blood lead level of concern	ug/dl	1
Skin area, residential	cm^2	2900
Soil adherence	ug/cm^2	200
Dermal uptake constant	(ug/dl)/(ug/day)	0.0001
Soil ingestion	mg/day	100
Soil ingestion, pica	mg/day	200
Ingestion constant	(ug/dl)/(ug/day)	0.16
Bioavailability	unitless	0.44
Breathing rate	m^3/day	6.8
Inhalation constant	(ug/dl)/(ug/day)	0.192

CHILDREN Pathway	typical Pathway contribution PEF	typical Pathway contribution ug/dl	typical Pathway contribution percent	with pica Pathway contribution PEF	with pica Pathway contribution ug/dl	with pica Pathway contribution percent
Soil Contact	2.1E-6	7.8E-05	1%	--	7.8E-05	0.4%
Soil Ingestion	2.5E-4	9.5E-03	99%	5.0E-4	1.9E-02	100%
Inhalation	7.0E-8	2.6E-06	0.03%	--	2.6E-06	0.01%

Notes:

[a] Highlighted values are Site-specific: days per week based on the assumption of 1 day per month (1 day/4 weeks = 0.25 days/week), 8 months per year. See Table 5.1 of the main report for details.

Table AOC9-B1.5b

Baseline Scenario Risk Evaluation for Lead in AOC 9 Shallow Soil (0 to 3 feet bgs) Using Depth-Weighted EPCs: Recreational User (Camper)

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Needles, California

LEAD RISK ASSESSMENT SPREADSHEET 8
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INPUT MEDIUM	**INPUT** LEVEL
Lead in Soil/Dust (ug/g)	36.4
Respirable Dust (ug/m^3)	1.5

OUTPUT	Percentile Estimate of Blood Pb (ug/dl) 50th	Percentile Estimate of Blood Pb (ug/dl) 90th	Percentile Estimate of Blood Pb (ug/dl) 95th	Percentile Estimate of Blood Pb (ug/dl) 98th	Percentile Estimate of Blood Pb (ug/dl) 99th	PRG-90 (ug/g)
BLOOD Pb, CHILD	0.009	0.017	0.02	0.02	0.03	2159
BLOOD Pb, PICA CHILD	0.018	0.03	0.04	0.05	0.05	1084

EXPOSURE PARAMETERS	units	children
Days per week	days/wk	0.25 [a]
Geometric Standard Deviation	ug/dl	1.6
Blood lead level of concern	ug/dl	1
Skin area, residential	cm^2	2900
Soil adherence	ug/cm^2	200
Dermal uptake constant	(ug/dl)/(ug/day)	0.0001
Soil ingestion	mg/day	100
Soil ingestion, pica	mg/day	200
Ingestion constant	(ug/dl)/(ug/day)	0.16
Bioavailability	unitless	0.44
Breathing rate	m^3/day	6.8
Inhalation constant	(ug/dl)/(ug/day)	0.192

CHILDREN Pathway	typical Pathway contribution PEF	typical Pathway contribution ug/dl	typical Pathway contribution percent	with pica Pathway contribution PEF	with pica Pathway contribution ug/dl	with pica Pathway contribution percent
Soil Contact	2.1E-6	7.5E-05	1%	--	7.5E-05	0.4%
Soil Ingestion	2.5E-4	9.2E-03	99%	5.0E-4	1.8E-02	100%
Inhalation	7.0E-8	2.5E-06	0.03%	--	2.5E-06	0.01%

Notes:
[a] Highlighted values are Site-specific: days per week based on the assumption of 1 day per month (1 day/4 weeks = 0.25 days/week), 8 months per year. See Table 5.1 of the main report for details.

Table AOC9-B1.5c

Baseline Scenario Risk Evaluation for Lead in AOC 9 Surface Soil (0 to 0.5 foot bgs) Using Depth-Weighted EPCs: Recreational User (Hiker)

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INPUT	INPUT
MEDIUM	LEVEL
Lead in Soil/Dust (ug/g)	37.6
Respirable Dust (ug/m^3)	1.5

OUTPUT	Percentile Estimate of Blood Pb (ug/dl) 50th	Percentile Estimate of Blood Pb (ug/dl) 90th	Percentile Estimate of Blood Pb (ug/dl) 95th	Percentile Estimate of Blood Pb (ug/dl) 98th	Percentile Estimate of Blood Pb (ug/dl) 99th	PRG-90 (ug/g)
BLOOD Pb, CHILD	0.010	0.017	0.02	0.03	0.03	2159
BLOOD Pb, PICA CHILD	0.019	0.03	0.04	0.05	0.06	1084

EXPOSURE PARAMETERS	units	children
Days per week	days/wk	0.25 [a]
Geometric Standard Deviation	ug/dl	1.6
Blood lead level of concern	ug/dl	1
Skin area, residential	cm^2	2900
Soil adherence	ug/cm^2	200
Dermal uptake constant	(ug/dl)/(ug/day)	0.0001
Soil ingestion	mg/day	100
Soil ingestion, pica	mg/day	200
Ingestion constant	(ug/dl)/(ug/day)	0.16
Bioavailability	unitless	0.44
Breathing rate	m^3/day	6.8
Inhalation constant	(ug/dl)/(ug/day)	0.192

CHILDREN	typical Pathway contribution	typical Pathway contribution	typical Pathway contribution	with pica Pathway contribution	with pica Pathway contribution	with pica Pathway contribution
Pathway	PEF	ug/dl	percent	PEF	ug/dl	percent
Soil Contact	2.1E-6	7.8E-05	1%	--	7.8E-05	0.4%
Soil Ingestion	2.5E-4	9.5E-03	99%	5.0E-4	1.9E-02	100%
Inhalation	7.0E-8	2.6E-06	0.03%	--	2.6E-06	0.01%

Notes:

[a] Highlighted values are Site-specific: days per week based on the assumption of 2 days per month (2 days/4 weeks = 0.5 days/week), 8 months per year. See Table 5.1 of the main report for details.

Table AOC9-B1.5d

Baseline Scenario Risk Evaluation for Lead in AOC 9 Shallow Soil (0 to 3 feet bgs) Using Depth-Weighted EPCs: Recreational User (Hiker)

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INPUT MEDIUM	**INPUT** LEVEL
Lead in Soil/Dust (ug/g)	36.4
Respirable Dust (ug/m^3)	1.5

OUTPUT	Percentile Estimate of Blood Pb (ug/dl) 50th	Percentile Estimate of Blood Pb (ug/dl) 90th	Percentile Estimate of Blood Pb (ug/dl) 95th	Percentile Estimate of Blood Pb (ug/dl) 98th	Percentile Estimate of Blood Pb (ug/dl) 99th	PRG-90 (ug/g)
BLOOD Pb, CHILD	0.009	0.017	0.02	0.02	0.03	2159
BLOOD Pb, PICA CHILD	0.018	0.03	0.04	0.05	0.05	1084

EXPOSURE PARAMETERS	units	children
Days per week	days/wk	0.25 [a]
Geometric Standard Deviation	ug/dl	1.6
Blood lead level of concern	ug/dl	1
Skin area, residential	cm^2	2900
Soil adherence	ug/cm^2	200
Dermal uptake constant	(ug/dl)/(ug/day)	0.0001
Soil ingestion	mg/day	100
Soil ingestion, pica	mg/day	200
Ingestion constant	(ug/dl)/(ug/day)	0.16
Bioavailability	unitless	0.44
Breathing rate	m^3/day	6.8
Inhalation constant	(ug/dl)/(ug/day)	0.192

CHILDREN Pathway	typical Pathway contribution PEF	typical Pathway contribution ug/dl	typical Pathway contribution percent	with pica Pathway contribution PEF	with pica Pathway contribution ug/dl	with pica Pathway contribution percent
Soil Contact	2.1E-6	7.5E-05	1%	--	7.5E-05	0.4%
Soil Ingestion	2.5E-4	9.2E-03	99%	5.0E-4	1.8E-02	100%
Inhalation	7.0E-8	2.5E-06	0.03%	--	2.5E-06	0.01%

Notes:

[a] Highlighted values are Site-specific: days per week based on the assumption of 2 days per month (2 days/4 weeks = 0.5 days/week), 8 months per year. See Table 5.1 of the main report for details.

Table AOC9-B1.5e

Baseline Scenario Risk Evaluation for Lead in AOC 9 Surface Soil (0 to 0.5 foot bgs) Using Depth-Weighted EPCs: Recreational User (Off-Highway Vehicle Rider)

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
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LEAD RISK ASSESSMENT SPREADSHEET 8
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INPUT MEDIUM	**INPUT** LEVEL
Lead in Soil/Dust (ug/g)	37.6
Respirable Dust (ug/m^3)	1.5

OUTPUT	Percentile Estimate of Blood Pb (ug/dl) 50th	Percentile Estimate of Blood Pb (ug/dl) 90th	Percentile Estimate of Blood Pb (ug/dl) 95th	Percentile Estimate of Blood Pb (ug/dl) 98th	Percentile Estimate of Blood Pb (ug/dl) 99th	PRG-90 (ug/g)
BLOOD Pb, CHILD	0.006	0.012	0.01	0.02	0.02	3180
BLOOD Pb, PICA CHILD	0.038	0.07	0.08	0.10	0.11	535

EXPOSURE PARAMETERS	units	children
Days per week	days/wk	0.5 [a]
Geometric Standard Deviation	ug/dl	1.6
Blood lead level of concern	ug/dl	1
Skin area, residential	cm^2	2900
Soil adherence	ug/cm^2	800 [a]
Dermal uptake constant	(ug/dl)/(ug/day)	0.0001
Soil ingestion	mg/day	31 [a]
Soil ingestion, pica	mg/day	200
Ingestion constant	(ug/dl)/(ug/day)	0.16
Bioavailability	unitless	0.44
Breathing rate	m^3/day	0.425 [a]
Inhalation constant	(ug/dl)/(ug/day)	0.192

CHILDREN Pathway	typical Pathway contribution PEF	typical Pathway contribution ug/dl	typical Pathway contribution percent	with pica Pathway contribution PEF	with pica Pathway contribution ug/dl	with pica Pathway contribution percent
Soil Contact	1.7E-5	6.2E-04	10%	--	6.2E-04	1.6%
Soil Ingestion	1.6E-4	5.8E-03	90%	1.0E-3	3.8E-02	98%
Inhalation	8.7E-9	3.3E-07	0.01%	--	3.3E-07	0.00%

Notes:
[a] Highlighted values are Site-specific: days per week based on the assumption of 2 days per month, 8 months per year. Soil ingestion rate of 330 mg/day is modified by exposure time (1.5 hours riding at site per 16 awake hours, or 0.09). Default inhalation breathing rate of 6.8 m^3/day is modified to account for exposure time (i.e., 1.5 hours riding at site per 24 hours, or 0.06) . See Table 5.1 of the main report for details.

Table AOC9-B1.5f

Baseline Scenario Risk Evaluation for Lead in AOC 9 Shallow Soil (0 to 3 feet bgs) Using Depth-Weighted EPCs: Recreational User (Off-Highway Vehicle Rider)

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LEAD RISK ASSESSMENT SPREADSHEET 8
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INPUT MEDIUM	**INPUT** LEVEL
Lead in Soil/Dust (ug/g)	36.4
Respirable Dust (ug/m^3)	1.5

OUTPUT	Percentile Estimate of Blood Pb (ug/dl) 50th	Percentile Estimate of Blood Pb (ug/dl) 90th	Percentile Estimate of Blood Pb (ug/dl) 95th	Percentile Estimate of Blood Pb (ug/dl) 98th	Percentile Estimate of Blood Pb (ug/dl) 99th	PRG-90 (ug/g)
BLOOD Pb, CHILD	0.006	0.011	0.01	0.02	0.02	3180
BLOOD Pb, PICA CHILD	0.037	0.07	0.08	0.10	0.11	535

EXPOSURE PARAMETERS	units	children
Days per week	days/wk	0.5 [a]
Geometric Standard Deviation	ug/dl	1.6
Blood lead level of concern	ug/dl	1
Skin area, residential	cm^2	2900
Soil adherence	ug/cm^2	800 [a]
Dermal uptake constant	(ug/dl)/(ug/day)	0.0001
Soil ingestion	mg/day	31 [a]
Soil ingestion, pica	mg/day	200
Ingestion constant	(ug/dl)/(ug/day)	0.16
Bioavailability	unitless	0.44
Breathing rate	m^3/day	0.425 [a]
Inhalation constant	(ug/dl)/(ug/day)	0.192

CHILDREN Pathway	typical Pathway contribution PEF	typical Pathway contribution ug/dl	typical Pathway contribution percent	with pica Pathway contribution PEF	with pica Pathway contribution ug/dl	with pica Pathway contribution percent
Soil Contact	1.7E-5	6.0E-04	10%	--	6.0E-04	1.6%
Soil Ingestion	1.6E-4	5.7E-03	90%	1.0E-3	3.7E-02	98%
Inhalation	8.7E-9	3.2E-07	0.01%	--	3.2E-07	0.00%

Notes:
[a] Highlighted values are Site-specific: days per week based on the assumption of 2 days per month, 8 months per year. Soil ingestion rate of 330 mg/day is modified by exposure time (1.5 hours riding at site per 16 awake hours, or 0.09). Default inhalation breathing rate of 6.8 m^3/day is modified to account for exposure time (i.e., 1.5 hours riding at site per 24 hours, or 0.06) . See Table 5.1 of the main report for details.

Table AOC9-B2.1a
Baseline Scenario Exposure Concentration and Dose Calculations for Carcinogenic Effects for C O P Cs in AOC 9 Soil Using Area-Weighted EPCs: Recreational User - Camper

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)
Inorganics								
Antimony	NC	NV	NC	NC	NC	NV	NC	NC
Arsenic	2.7E-11	NV	1.4E-08	1.5E-07	2.6E-11	NV	1.4E-08	1.4E-07
Chromium, Hexavalent	3.5E-11	NV	NA	3.2E-07	2.3E-11	NV	NA	2.1E-07
Chromium, total	NC	NV	NC	NC	NC	NV	NC	NC
Copper	NC	NV	NC	NC	NC	NV	NC	NC
Lead	na	na	na	na	na	na	na	na
Mercury (inorganic)	NC	NC	NC	NC	NC	NC	NC	NC
Nickel	1.0E-10	NV	NC	NC	9.8E-11	NV	NC	NC
Thallium	ND	NV	ND	ND	NC	NV	NC	NC
Zinc	NC	NV	NC	NC	NC	NV	NC	NC
Volatile Organic Compounds								
Isophorone	NC	NV	3.0E-08	9.2E-08	NC	NV	3.0E-07	9.4E-07
Polycyclic Aromatic Hydrocarbons								
1-Methyl naphthalene	9.6E-13	1.3E-09	2.5E-09	5.3E-09	8.4E-14	1.3E-09	2.2E-10	4.6E-10
2-Methyl naphthalene	NC	NV	NC	NC	NC	NV	NC	NC
Acenaphthene	NC	NV	NC	NC	NC	NV	NC	NC
Acenaphthylene	NC	NV	NC	NC	NC	NV	NC	NC
Anthracene	NC	NV	NC	NC	NC	NV	NC	NC
Benzo (a) anthracene	NA	5.8E-10	NA	NA	NA	5.8E-10	NA	NA
Benzo (a) pyrene	NA	NV	NA	NA	NA	NV	NA	NA
Benzo (b) fluoranthene	NA	NV	NA	NA	NA	NV	NA	NA
Benzo (ghi) perylene	NC	NV	NC	NC	NC	NV	NC	NC
Benzo (k) fluoranthene	NA	NV	NA	NA	NA	NV	NA	NA
Chrysene	NA	NV	NA	NA	NA	NV	NA	NA
Dibenzo (a,h) anthracene	NA	NV	NA	NA	NA	NV	NA	NA
Fluoranthene	NC	NV	NC	NC	NC	NV	NC	NC
Fluorene	NC	NV	NC	NC	NC	NV	NC	NC
Indeno (1,2,3-cd) pyrene	NA	NV	NA	NA	NA	NV	NA	NA
Naphthalene	9.6E-14	9.4E-10	2.5E-10	5.3E-10	5.5E-14	9.4E-10	1.5E-10	3.0E-10
Phenanthrene	NC	NV	NC	NC	NC	NV	NC	NC
Pyrene	NC	NV	NC	NC	NC	NV	NC	NC
B(a)P Equivalent	1.1E-11	NV	4.4E-08	9.7E-08	7.7E-12	NV	3.2E-08	7.0E-08
Pesticides								
4,4-DDE	1.9E-14	1.3E-11	1.7E-11	1.1E-10	1.9E-14	1.3E-11	1.7E-11	1.1E-10

Table AOC9-B2.1a
Baseline Scenario Exposure Concentration and Dose Calculations for Carcinogenic Effects for C O P Cs in AOC 9 Soil Using Area-Weighted EPCs: Recreational User - Camper

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)
Polychlorinated Biphenyls								
Total PCBs	1.8E-12	2.8E-09	4.7E-09	9.8E-09	2.1E-12	2.8E-09	5.5E-09	1.1E-08
Total Petroleum Hydrocarbons								
TPH as diesel	NC	NC	NC	NC	NC	NC	NC	NC
TPH as motor oil	NC	NC	NC	NC	NC	NC	NC	NC
Dioxins/Furans								
TEQ Human	6.3E-16	6.1E-13	3.3E-13	3.5E-12	4.2E-16	6.1E-13	2.2E-13	2.3E-12

Notes:
[a] EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
CDI = Chronic Daily Intake.
C O P C = Constituent of Potential Concern.
EC = Exposure Concentration.
mg/kg-day = milligrams per kilogram per day.
mg/m^3 = milligrams per cubic meter.
na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/ E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.
NA = Not applicable. Carcinogenic polycyclic aromatic hydrocarbons (CPAHs) are evaluated using benzo(a)pyrene equivalents. Hexavalent chromium is not absorbed via dermal contact.
NC = Not considered a carcinogen.
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC9-B2.1b
Baseline Scenario Exposure Concentration and Dose Calculations for Carcinogenic Effects for C O P Cs in AOC 9 Soil Using Area-Weighted EPCs: Recreational User - Hiker

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)
Inorganics								
Antimony	NC	NV	NC	NC	NC	NV	NC	NC
Arsenic	5.3E-11	NV	2.8E-08	2.9E-07	5.2E-11	NV	2.8E-08	2.9E-07
Chromium, Hexavalent	7.1E-11	NV	NA	6.4E-07	4.7E-11	NV	NA	4.2E-07
Chromium, total	NC	NV	NC	NC	NC	NV	NC	NC
Copper	NC	NV	NC	NC	NC	NV	NC	NC
Lead	na	na	na	na	na	na	na	na
Mercury (inorganic)	NC	NC	NC	NC	NC	NC	NC	NC
Nickel	2.0E-10	NV	NC	NC	2.0E-10	NV	NC	NC
Thallium	ND	NV	ND	ND	NC	NV	NC	NC
Zinc	NC	NV	NC	NC	NC	NV	NC	NC
Volatile Organic Compounds								
Isophorone	NC	NV	5.9E-08	1.8E-07	NC	NV	6.0E-07	1.9E-06
Polycyclic Aromatic Hydrocarbons								
1-Methyl naphthalene	1.9E-12	2.5E-09	5.1E-09	1.1E-08	1.7E-13	2.5E-09	4.4E-10	9.2E-10
2-Methyl naphthalene	NC	NV	NC	NC	NC	NV	NC	NC
Acenaphthene	NC	NV	NC	NC	NC	NV	NC	NC
Acenaphthylene	NC	NV	NC	NC	NC	NV	NC	NC
Anthracene	NC	NV	NC	NC	NC	NV	NC	NC
Benzo (a) anthracene	NA	1.2E-09	NA	NA	NA	1.2E-09	NA	NA
Benzo (a) pyrene	NA	NV	NA	NA	NA	NV	NA	NA
Benzo (b) fluoranthene	NA	NV	NA	NA	NA	NV	NA	NA
Benzo (ghi) perylene	NC	NV	NC	NC	NC	NV	NC	NC
Benzo (k) fluoranthene	NA	NV	NA	NA	NA	NV	NA	NA
Chrysene	NA	NV	NA	NA	NA	NV	NA	NA
Dibenzo (a,h) anthracene	NA	NV	NA	NA	NA	NV	NA	NA
Fluoranthene	NC	NV	NC	NC	NC	NV	NC	NC
Fluorene	NC	NV	NC	NC	NC	NV	NC	NC
Indeno (1,2,3-cd) pyrene	NA	NV	NA	NA	NA	NV	NA	NA
Naphthalene	1.9E-13	1.9E-09	5.1E-10	1.1E-09	1.1E-13	1.9E-09	2.9E-10	6.1E-10
Phenanthrene	NC	NV	NC	NC	NC	NV	NC	NC
Pyrene	NC	NV	NC	NC	NC	NV	NC	NC
B(a)P Equivalent	2.2E-11	NV	8.9E-08	1.9E-07	1.5E-11	NV	6.4E-08	1.4E-07
Pesticides								
4,4-DDE	3.8E-14	2.5E-11	3.4E-11	2.1E-10	3.8E-14	2.5E-11	3.4E-11	2.1E-10

Table AOC9-B2.1b
Baseline Scenario Exposure Concentration and Dose Calculations for Carcinogenic Effects for C O P Cs in AOC 9 Soil Using Area-Weighted EPCs: Recreational User - Hiker

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)
Polychlorinated Biphenyls								
Total PCBs	3.6E-12	5.7E-09	9.5E-09	2.0E-08	4.1E-12	5.7E-09	1.1E-08	2.3E-08
Total Petroleum Hydrocarbons								
TPH as diesel	NC	NC	NC	NC	NC	NC	NC	NC
TPH as motor oil	NC	NC	NC	NC	NC	NC	NC	NC
Dioxins/Furans								
TEQ Human	1.3E-15	1.2E-12	6.7E-13	6.9E-12	8.4E-16	1.2E-12	4.5E-13	4.6E-12

Notes:
[a] EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
CDI = Chronic Daily Intake.
C O P C = Constituent of Potential Concern.
EC = Exposure Concentration.
mg/kg-day = milligrams per kilogram per day.
mg/m^3 = milligrams per cubic meter.
na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/ E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.
NA = Not applicable. Carcinogenic polycyclic aromatic hydrocarbons (CPAHs) are evaluated using benzo(a)pyrene equivalents. Hexavalent chromium is not absorbed via dermal contact.
NC = Not considered a carcinogen.
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC9-B2.1c
Baseline Scenario Exposure Concentration and Dose Calculations for Carcinogenic Effects for C O P Cs in AOC 9 Soil Using Area-Weighted EPCs: Recreational User - Off-Highway Vehicle Rider

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)
Inorganics								
Antimony	NC	NV	NC	NC	NC	NV	NC	NC
Arsenic	5.3E-09	NV	1.4E-07	3.7E-08	5.3E-09	NV	1.3E-07	3.7E-08
Chromium, Hexavalent	4.5E-09	NV	NA	3.7E-08	3.0E-09	NV	NA	2.5E-08
Chromium, total	NC	NV	NC	NC	NC	NV	NC	NC
Copper	NC	NV	NC	NC	NC	NV	NC	NC
Lead	na	na	na	na	na	na	na	na
Mercury (inorganic)	NC	NC	NC	NC	NC	NC	NC	NC
Nickel	2.0E-08	NV	NC	NC	2.0E-08	NV	NC	NC
Thallium	ND	NV	ND	ND	NC	NV	NC	NC
Zinc	NC	NV	NC	NC	NC	NV	NC	NC
Volatile Organic Compounds								
Isophorone	NC	NV	2.9E-07	2.3E-08	NC	NV	2.9E-06	2.4E-07
Polycyclic Aromatic Hydrocarbons								
1-Methyl naphthalene	1.9E-10	1.6E-10	2.4E-08	1.3E-09	1.7E-11	1.6E-10	2.1E-09	1.2E-10
2-Methyl naphthalene	NC	NV	NC	NC	NC	NV	NC	NC
Acenaphthene	NC	NV	NC	NC	NC	NV	NC	NC
Acenaphthylene	NC	NV	NC	NC	NC	NV	NC	NC
Anthracene	NC	NV	NC	NC	NC	NV	NC	NC
Benzo (a) anthracene	NA	4.6E-11	NA	NA	NA	4.6E-11	NA	NA
Benzo (a) pyrene	NA	NV	NA	NA	NA	NV	NA	NA
Benzo (b) fluoranthene	NA	NV	NA	NA	NA	NV	NA	NA
Benzo (ghi) perylene	NC	NV	NC	NC	NC	NV	NC	NC
Benzo (k) fluoranthene	NA	NV	NA	NA	NA	NV	NA	NA
Chrysene	NA	NV	NA	NA	NA	NV	NA	NA
Dibenzo (a,h) anthracene	NA	NV	NA	NA	NA	NV	NA	NA
Fluoranthene	NC	NV	NC	NC	NC	NV	NC	NC
Fluorene	NC	NV	NC	NC	NC	NV	NC	NC
Indeno (1,2,3-cd) pyrene	NA	NV	NA	NA	NA	NV	NA	NA
Naphthalene	1.9E-11	1.2E-10	2.4E-09	1.3E-10	1.1E-11	1.2E-10	1.4E-09	7.7E-11
Phenanthrene	NC	NV	NC	NC	NC	NV	NC	NC
Pyrene	NC	NV	NC	NC	NC	NV	NC	NC
B(a)P Equivalent	1.4E-09	NV	1.8E-07	1.1E-08	9.9E-10	NV	1.3E-07	8.1E-09
Pesticides								
4,4-DDE	3.8E-12	1.6E-12	1.6E-10	2.7E-11	3.8E-12	1.6E-12	1.6E-10	2.7E-11

Table AOC9-B2.1c
Baseline Scenario Exposure Concentration and Dose Calculations for Carcinogenic Effects for C O P Cs in AOC 9 Soil Using Area-Weighted EPCs: Recreational User - Off-Highway Vehicle Rider

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)
Polychlorinated Biphenyls								
Total PCBs	3.6E-10	3.5E-10	4.6E-08	2.5E-09	4.2E-10	3.5E-10	5.3E-08	2.9E-09
Total Petroleum Hydrocarbons								
TPH as diesel	NC	NC	NC	NC	NC	NC	NC	NC
TPH as motor oil	NC	NC	NC	NC	NC	NC	NC	NC
Dioxins/Furans								
TEQ Human	1.3E-13	7.6E-14	3.2E-12	8.8E-13	8.5E-14	7.6E-14	2.2E-12	5.9E-13

Notes:
[a] EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
CDI = Chronic Daily Intake.
C O P C = Constituent of Potential Concern.
EC = Exposure Concentration.
mg/kg-day = milligrams per kilogram per day.
mg/m^3 = milligrams per cubic meter.
na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/ E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.
NA = Not applicable. Carcinogenic polycyclic aromatic hydrocarbons (CPAHs) are evaluated using benzo(a)pyrene equivalents. Hexavalent chromium is not absorbed via dermal contact.
NC = Not considered a carcinogen.
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC9-B2.2a
Baseline Scenario Exposure Concentration and Dose Calculations for Noncarcinogenic Effects for C O P Cs in AOC 9 Soil Using Area-Weighted EPCs: Recreational User - Camper

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Child Camper (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Child Camper (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Child Camper (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child Camper (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)
Inorganics																
Antimony	2.4E-10	NV	1.3E-07	4.4E-06	2.4E-10	NV	1.7E-08	4.1E-07	1.7E-10	NV	8.7E-08	3.0E-06	1.7E-10	NV	1.2E-08	2.8E-07
Arsenic	7.2E-11	NV	1.1E-07	1.3E-06	7.2E-11	NV	1.5E-08	1.2E-07	7.0E-11	NV	1.1E-07	1.3E-06	7.0E-11	NV	1.5E-08	1.2E-07
Chromium, Hexavalent	3.4E-11	NV	NA	6.3E-07	3.4E-11	NV	NA	5.9E-08	2.3E-11	NV	NA	4.1E-07	2.3E-11	NV	NA	3.9E-08
Chromium, total	7.4E-10	NV	3.9E-07	1.3E-05	7.4E-10	NV	5.3E-08	1.3E-06	5.8E-10	NV	3.0E-07	1.1E-05	5.8E-10	NV	4.2E-08	9.8E-07
Copper	7.0E-10	NV	3.7E-07	1.3E-05	7.0E-10	NV	5.0E-08	1.2E-06	5.6E-10	NV	3.0E-07	1.0E-05	5.6E-10	NV	4.0E-08	9.6E-07
Lead	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	7.4E-11	NV	3.9E-08	1.4E-06	7.4E-11	NV	5.3E-09	1.3E-07	3.5E-11	NV	1.8E-08	6.3E-07	3.5E-11	NV	2.5E-09	5.9E-08
Nickel	2.7E-10	NV	1.4E-07	4.9E-06	2.7E-10	NV	1.9E-08	4.6E-07	2.6E-10	NV	1.4E-07	4.8E-06	2.6E-10	NV	1.9E-08	4.5E-07
Thallium	ND	NV	ND	ND	ND	NV	ND	ND	2.4E-11	NV	1.3E-08	4.4E-07	2.4E-11	NV	1.8E-09	4.2E-08
Zinc	2.0E-09	NV	1.1E-06	3.7E-05	2.0E-09	NV	1.5E-07	3.5E-06	2.0E-09	NV	1.0E-06	3.6E-05	2.0E-09	NV	1.4E-07	3.4E-06
Volatile Organic Compounds																
Isophorone	4.5E-11	NV	2.4E-07	8.2E-07	4.5E-11	NV	3.2E-08	7.7E-08	4.6E-10	NV	2.4E-06	8.4E-06	4.6E-10	NV	3.3E-07	7.8E-07
Polycyclic Aromatic Hydrocarbons																
1-Methyl naphthalene	2.6E-12	3.4E-09	2.0E-08	4.7E-08	2.6E-12	3.4E-09	2.8E-09	4.4E-09	2.3E-13	3.4E-09	1.8E-09	4.1E-09	2.3E-13	3.4E-09	2.4E-10	3.8E-10
2-Methyl naphthalene	1.9E-12	3.3E-09	1.5E-08	3.5E-08	1.9E-12	3.3E-09	2.1E-09	3.3E-09	2.1E-13	3.3E-09	1.7E-09	3.8E-09	2.1E-13	3.3E-09	2.3E-10	3.6E-10
Acenaphthene	1.4E-13	1.0E-09	1.1E-09	2.5E-09	1.4E-13	1.0E-09	1.5E-10	2.3E-10	1.4E-13	1.0E-09	1.1E-09	2.6E-09	1.4E-13	1.0E-09	1.5E-10	2.4E-10
Acenaphthylene	4.2E-13	NV	3.3E-09	7.6E-09	4.2E-13	NV	4.5E-10	7.1E-10	2.9E-13	NV	2.3E-09	5.3E-09	2.9E-13	NV	3.2E-10	5.0E-10
Anthracene	2.4E-13	7.1E-10	1.9E-09	4.3E-09	2.4E-13	7.1E-10	2.5E-10	4.0E-10	2.0E-13	7.1E-10	1.6E-09	3.6E-09	2.0E-13	7.1E-10	2.1E-10	3.3E-10
Benzo (a) anthracene	3.0E-12	5.6E-10	2.4E-08	5.4E-08	3.0E-12	5.6E-10	3.2E-09	5.1E-09	2.4E-12	5.6E-10	1.9E-08	4.4E-08	2.4E-12	5.6E-10	2.6E-09	4.1E-09
Benzo (a) pyrene	5.7E-12	NV	4.5E-08	1.0E-07	5.7E-12	NV	6.1E-09	9.6E-09	4.0E-12	NV	3.2E-08	7.3E-08	4.0E-12	NV	4.3E-09	6.8E-09
Benzo (b) fluoranthene	2.0E-11	NV	1.6E-07	3.7E-07	2.0E-11	NV	2.2E-08	3.5E-08	1.4E-11	NV	1.1E-07	2.5E-07	1.4E-11	NV	1.5E-08	2.4E-08
Benzo (ghi) perylene	2.9E-12	NV	2.3E-08	5.3E-08	2.9E-12	NV	3.2E-09	5.0E-09	2.5E-12	NV	1.9E-08	4.5E-08	2.5E-12	NV	2.7E-09	4.2E-09
Benzo (k) fluoranthene	7.9E-12	NV	6.3E-08	1.4E-07	7.9E-12	NV	8.5E-09	1.3E-08	5.3E-12	NV	4.2E-08	9.6E-08	5.3E-12	NV	5.7E-09	9.0E-09
Chrysene	6.9E-12	NV	5.4E-08	1.2E-07	6.9E-12	NV	7.4E-09	1.2E-08	4.8E-12	NV	3.8E-08	8.6E-08	4.8E-12	NV	5.1E-09	8.1E-09
Dibenzo (a,h) anthracene	2.6E-12	NV	2.1E-08	4.7E-08	2.6E-12	NV	2.8E-09	4.4E-09	1.8E-12	NV	1.4E-08	3.2E-08	1.8E-12	NV	1.9E-09	3.0E-09
Fluoranthene	4.4E-12	NV	3.5E-08	8.0E-08	4.4E-12	NV	4.8E-09	7.5E-09	3.9E-12	NV	3.0E-08	7.0E-08	3.9E-12	NV	4.1E-09	6.5E-09
Fluorene	1.6E-13	4.5E-10	1.2E-09	2.9E-09	1.6E-13	4.5E-10	1.7E-10	2.7E-10	1.2E-13	4.5E-10	9.4E-10	2.2E-09	1.2E-13	4.5E-10	1.3E-10	2.0E-10
Indeno (1,2,3-cd) pyrene	2.8E-12	NV	2.2E-08	5.0E-08	2.8E-12	NV	3.0E-09	4.7E-09	2.1E-12	NV	1.7E-08	3.9E-08	2.1E-12	NV	2.3E-09	3.6E-09
Naphthalene	2.6E-13	2.5E-09	2.0E-09	4.7E-09	2.6E-13	2.5E-09	2.8E-10	4.4E-10	1.5E-13	2.5E-09	1.2E-09	2.7E-09	1.5E-13	2.5E-09	1.6E-10	2.5E-10
Phenanthrene	1.5E-12	NV	1.2E-08	2.8E-08	1.5E-12	NV	1.7E-09	2.6E-09	1.2E-12	NV	9.6E-09	2.2E-08	1.2E-12	NV	1.3E-09	2.1E-09
Pyrene	4.3E-12	1.8E-09	3.4E-08	7.7E-08	4.3E-12	1.8E-09	4.6E-09	7.3E-09	3.6E-12	1.8E-09	2.8E-08	6.5E-08	3.6E-12	1.8E-09	3.9E-09	6.1E-09
B(a)P Equivalent	NA	NV	NA	NA	NA	NV	NA	NA	NA	NV	NA	NA	NA	NV	NA	NA
Pesticides																
4,4-DDE	5.2E-14	3.4E-11	1.4E-10	9.4E-10	5.2E-14	3.4E-11	1.9E-11	8.8E-11	5.2E-14	3.4E-11	1.4E-10	9.4E-10	5.2E-14	3.4E-11	1.9E-11	8.8E-11
Polychlorinated Biphenyls																
Total PCBs	4.8E-12	7.6E-09	3.8E-08	8.7E-08	4.8E-12	7.6E-09	5.2E-09	8.2E-09	5.6E-12	7.6E-09	4.4E-08	1.0E-07	5.6E-12	7.6E-09	6.0E-09	9.5E-09
Total Petroleum Hydrocarbons																
TPH as diesel	4.4E-09	9.5E-04	2.3E-05	7.9E-05	4.4E-09	9.5E-04	3.1E-06	7.4E-06	3.4E-09	9.5E-04	1.8E-05	6.2E-05	3.4E-09	9.5E-04	2.4E-06	5.8E-06
TPH as motor oil	1.0E-08	NV	5.3E-05	1.8E-04	1.0E-08	NV	7.2E-06	1.7E-05	8.3E-09	NV	4.4E-05	1.5E-04	8.3E-09	NV	5.9E-06	1.4E-05

Table AOC9-B2.2a
Baseline Scenario Exposure Concentration and Dose Calculations for Noncarcinogenic Effects for C O P Cs in AOC 9 Soil Using Area-Weighted EPCs: Recreational User - Camper

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Child Camper (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Child Camper (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Child Camper (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child Camper (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)
Dioxins/Furans																
TEQ Human	1.7E-15	1.6E-12	2.7E-12	3.1E-11	1.7E-15	1.6E-12	3.7E-13	2.9E-12	1.1E-15	1.6E-12	1.8E-12	2.1E-11	1.1E-15	1.6E-12	2.4E-13	1.9E-12

Notes:
[a] EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
CDI = Chronic Daily Intake.
C O P C = Constituent of Potential Concern.
EC = Exposure Concentration.
mg/kg-day = milligrams per kilogram per day.
mg/m^3 = milligrams per cubic meter.
na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/ E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.
NA = Not applicable. Noncancer effects of carcinogenic polycyclic aromatic hydrocarbons (CPAHs) are evaluated separately for each chemical (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene).
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC9-B2.2b
Baseline Scenario Exposure Concentration and Dose Calculations for Noncarcinogenic Effects for C O P Cs in AOC 9 Soil Using Area-Weighted EPCs: Recreational User - Hiker

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)
Inorganics																
Antimony	4.8E-10	NV	2.5E-07	8.8E-06	4.8E-10	NV	3.5E-08	8.2E-07	3.3E-10	NV	1.7E-07	6.0E-06	3.3E-10	NV	2.4E-08	5.6E-07
Arsenic	1.4E-10	NV	2.3E-07	2.6E-06	1.4E-10	NV	3.1E-08	2.4E-07	1.4E-10	NV	2.2E-07	2.6E-06	1.4E-10	NV	3.0E-08	2.4E-07
Chromium, Hexavalent	6.9E-11	NV	NA	1.3E-06	6.9E-11	NV	NA	1.2E-07	4.6E-11	NV	NA	8.3E-07	4.6E-11	NV	NA	7.7E-08
Chromium, total	1.5E-09	NV	7.8E-07	2.7E-05	1.5E-09	NV	1.1E-07	2.5E-06	1.2E-09	NV	6.1E-07	2.1E-05	1.2E-09	NV	8.3E-08	2.0E-06
Copper	1.4E-09	NV	7.4E-07	2.5E-05	1.4E-09	NV	1.0E-07	2.4E-06	1.1E-09	NV	5.9E-07	2.0E-05	1.1E-09	NV	8.1E-08	1.9E-06
Lead	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	1.5E-10	NV	7.8E-08	2.7E-06	1.5E-10	NV	1.1E-08	2.5E-07	6.9E-11	NV	3.6E-08	1.3E-06	6.9E-11	NV	5.0E-09	1.2E-07
Nickel	5.4E-10	NV	2.8E-07	9.8E-06	5.4E-10	NV	3.9E-08	9.2E-07	5.3E-10	NV	2.8E-07	9.6E-06	5.3E-10	NV	3.8E-08	9.0E-07
Thallium	ND	NV	ND	ND	ND	NV	ND	ND	4.9E-11	NV	2.6E-08	8.9E-07	4.9E-11	NV	3.5E-09	8.3E-08
Zinc	4.1E-09	NV	2.1E-06	7.4E-05	4.1E-09	NV	2.9E-07	6.9E-06	4.0E-09	NV	2.1E-06	7.2E-05	4.0E-09	NV	2.8E-07	6.7E-06
Volatile Organic Compounds																
Isophorone	9.0E-11	NV	4.7E-07	1.6E-06	9.0E-11	NV	6.5E-08	1.5E-07	9.2E-10	NV	4.8E-06	1.7E-05	9.2E-10	NV	6.6E-07	1.6E-06
Polycyclic Aromatic Hydrocarbons																
1-Methyl naphthalene	5.2E-12	6.7E-09	4.1E-08	9.4E-08	5.2E-12	6.7E-09	5.6E-09	8.8E-09	4.5E-13	6.7E-09	3.6E-09	8.2E-09	4.5E-13	6.7E-09	4.9E-10	7.7E-10
2-Methyl naphthalene	3.9E-12	6.6E-09	3.1E-08	7.0E-08	3.9E-12	6.6E-09	4.2E-09	6.6E-09	4.2E-13	6.6E-09	3.3E-09	7.7E-09	4.2E-13	6.6E-09	4.5E-10	7.2E-10
Acenaphthene	2.7E-13	2.1E-09	2.2E-09	5.0E-09	2.7E-13	2.1E-09	2.9E-10	4.7E-10	2.9E-13	2.1E-09	2.3E-09	5.2E-09	2.9E-13	2.1E-09	3.1E-10	4.9E-10
Acenaphthylene	8.4E-13	NV	6.6E-09	1.5E-08	8.4E-13	NV	9.0E-10	1.4E-09	5.9E-13	NV	4.6E-09	1.1E-08	5.9E-13	NV	6.3E-10	1.0E-09
Anthracene	4.7E-13	1.4E-09	3.7E-09	8.5E-09	4.7E-13	1.4E-09	5.1E-10	8.0E-10	3.9E-13	1.4E-09	3.1E-09	7.1E-09	3.9E-13	1.4E-09	4.2E-10	6.7E-10
Benzo (a) anthracene	6.0E-12	1.1E-09	4.7E-08	1.1E-07	6.0E-12	1.1E-09	6.5E-09	1.0E-08	4.8E-12	1.1E-09	3.8E-08	8.7E-08	4.8E-12	1.1E-09	5.2E-09	8.2E-09
Benzo (a) pyrene	1.1E-11	NV	8.9E-08	2.1E-07	1.1E-11	NV	1.2E-08	1.9E-08	8.1E-12	NV	6.4E-08	1.5E-07	8.1E-12	NV	8.7E-09	1.4E-08
Benzo (b) fluoranthene	4.1E-11	NV	3.2E-07	7.4E-07	4.1E-11	NV	4.4E-08	6.9E-08	2.8E-11	NV	2.2E-07	5.1E-07	2.8E-11	NV	3.0E-08	4.8E-08
Benzo (ghi) perylene	5.9E-12	NV	4.7E-08	1.1E-07	5.9E-12	NV	6.4E-09	1.0E-08	4.9E-12	NV	3.9E-08	8.9E-08	4.9E-12	NV	5.3E-09	8.4E-09
Benzo (k) fluoranthene	1.6E-11	NV	1.3E-07	2.9E-07	1.6E-11	NV	1.7E-08	2.7E-08	1.1E-11	NV	8.4E-08	1.9E-07	1.1E-11	NV	1.1E-08	1.8E-08
Chrysene	1.4E-11	NV	1.1E-07	2.5E-07	1.4E-11	NV	1.5E-08	2.3E-08	9.5E-12	NV	7.5E-08	1.7E-07	9.5E-12	NV	1.0E-08	1.6E-08
Dibenzo (a,h) anthracene	5.2E-12	NV	4.1E-08	9.5E-08	5.2E-12	NV	5.6E-09	8.9E-09	3.5E-12	NV	2.8E-08	6.4E-08	3.5E-12	NV	3.8E-09	6.0E-09
Fluoranthene	8.8E-12	NV	7.0E-08	1.6E-07	8.8E-12	NV	9.5E-09	1.5E-08	7.7E-12	NV	6.1E-08	1.4E-07	7.7E-12	NV	8.3E-09	1.3E-08
Fluorene	3.2E-13	9.0E-10	2.5E-09	5.7E-09	3.2E-13	9.0E-10	3.4E-10	5.4E-10	2.4E-13	9.0E-10	1.9E-09	4.3E-09	2.4E-13	9.0E-10	2.6E-10	4.1E-10
Indeno (1,2,3-cd) pyrene	5.5E-12	NV	4.4E-08	1.0E-07	5.5E-12	NV	6.0E-09	9.4E-09	4.3E-12	NV	3.4E-08	7.7E-08	4.3E-12	NV	4.6E-09	7.2E-09
Naphthalene	5.2E-13	5.1E-09	4.1E-09	9.4E-09	5.2E-13	5.1E-09	5.6E-10	8.8E-10	3.0E-13	5.1E-09	2.3E-09	5.4E-09	3.0E-13	5.1E-09	3.2E-10	5.1E-10
Phenanthrene	3.1E-12	NV	2.4E-08	5.6E-08	3.1E-12	NV	3.3E-09	5.3E-09	2.4E-12	NV	1.9E-08	4.4E-08	2.4E-12	NV	2.6E-09	4.1E-09
Pyrene	8.5E-12	3.5E-09	6.7E-08	1.5E-07	8.5E-12	3.5E-09	9.2E-09	1.5E-08	7.2E-12	3.5E-09	5.7E-08	1.3E-07	7.2E-12	3.5E-09	7.8E-09	1.2E-08
B(a)P Equivalent	NA	NV	NA	NA	NA	NV	NA	NA	NA	NV	NA	NA	NA	NV	NA	NA
Pesticides																
4,4-DDE	1.0E-13	6.7E-11	2.7E-10	1.9E-09	1.0E-13	6.7E-11	3.7E-11	1.8E-10	1.0E-13	6.7E-11	2.7E-10	1.9E-09	1.0E-13	6.7E-11	3.7E-11	1.8E-10
Polychlorinated Biphenyls																
Total PCBs	9.6E-12	1.5E-08	7.6E-08	1.7E-07	9.6E-12	1.5E-08	1.0E-08	1.6E-08	1.1E-11	1.5E-08	8.8E-08	2.0E-07	1.1E-11	1.5E-08	1.2E-08	1.9E-08
Total Petroleum Hydrocarbons																
TPH as diesel	8.7E-09	1.9E-03	4.6E-05	1.6E-04	8.7E-09	1.9E-03	6.3E-06	1.5E-05	6.8E-09	1.9E-03	3.6E-05	1.2E-04	6.8E-09	1.9E-03	4.9E-06	1.2E-05
TPH as motor oil	2.0E-08	NV	1.1E-04	3.6E-04	2.0E-08	NV	1.4E-05	3.4E-05	1.7E-08	NV	8.7E-05	3.0E-04	1.7E-08	NV	1.2E-05	2.8E-05

Table AOC9-B2.2b
Baseline Scenario Exposure Concentration and Dose Calculations for Noncarcinogenic Effects for C O P Cs in AOC 9 Soil Using Area-Weighted EPCs: Recreational User - Hiker

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)
Dioxins/Furans																
TEQ Human	3.4E-15	3.3E-12	5.4E-12	6.2E-11	3.4E-15	3.3E-12	7.3E-13	5.8E-12	2.3E-15	3.3E-12	3.6E-12	4.1E-11	2.3E-15	3.3E-12	4.9E-13	3.9E-12

Notes:
[a] EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
CDI = Chronic Daily Intake.
C O P C = Constituent of Potential Concern.
EC = Exposure Concentration.
mg/kg-day = milligrams per kilogram per day.
mg/m^3 = milligrams per cubic meter.
na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/ E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.
NA = Not applicable. Noncancer effects of carcinogenic polycyclic aromatic hydrocarbons (CPAHs) are evaluated separately for each chemical (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene).
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC9-B2.2c
Baseline Scenario Exposure Concentration and Dose Calculations for Noncarcinogenic Effects for C O P Cs in AOC 9 Soil Using Area-Weighted EPCs:
Recreational User - Off-Highway Vehicle Rider

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Child OHV Rider (0 to 3 feet bgs)a Soil Pathway EC: Particulate Inhalation (mg/m^3)	Child OHV Rider (0 to 3 feet bgs)a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Child OHV Rider (0 to 3 feet bgs)a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child OHV Rider (0 to 3 feet bgs)a Soil Pathway CDI: Ingestion (mg/kg-day)	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)
Inorganics																
Antimony	4.9E-08	NV	4.6E-07	6.2E-07	4.9E-08	NV	4.0E-07	2.5E-07	3.3E-08	NV	3.2E-07	4.2E-07	3.3E-08	NV	2.7E-07	1.7E-07
Arsenic	1.4E-08	NV	4.1E-07	1.8E-07	1.4E-08	NV	3.5E-07	7.5E-08	1.4E-08	NV	4.0E-07	1.8E-07	1.4E-08	NV	3.5E-07	7.4E-08
Chromium, Hexavalent	6.9E-09	NV	NA	8.8E-08	6.9E-09	NV	NA	3.6E-08	4.6E-09	NV	NA	5.8E-08	4.6E-09	NV	NA	2.4E-08
Chromium, total	1.5E-07	NV	1.4E-06	1.9E-06	1.5E-07	NV	1.2E-06	7.8E-07	1.2E-07	NV	1.1E-06	1.5E-06	1.2E-07	NV	9.5E-07	6.1E-07
Copper	1.4E-07	NV	1.3E-06	1.8E-06	1.4E-07	NV	1.2E-06	7.4E-07	1.1E-07	NV	1.1E-06	1.4E-06	1.1E-07	NV	9.2E-07	5.9E-07
Lead	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	1.5E-08	NV	1.4E-07	1.9E-07	1.5E-08	NV	1.2E-07	7.8E-08	7.0E-09	NV	6.6E-08	8.8E-08	7.0E-09	NV	5.7E-08	3.6E-08
Nickel	5.4E-08	NV	5.1E-07	6.9E-07	5.4E-08	NV	4.4E-07	2.8E-07	5.3E-08	NV	5.1E-07	6.7E-07	5.3E-08	NV	4.3E-07	2.8E-07
Thallium	ND	NV	ND	ND	ND	NV	ND	ND	4.9E-09	NV	4.7E-08	6.2E-08	4.9E-09	NV	4.0E-08	2.6E-08
Zinc	4.1E-07	NV	3.9E-06	5.2E-06	4.1E-07	NV	3.3E-06	2.1E-06	4.0E-07	NV	3.8E-06	5.1E-06	4.0E-07	NV	3.3E-06	2.1E-06
Volatile Organic Compounds																
Isophorone	9.1E-09	NV	8.6E-07	1.2E-07	9.1E-09	NV	7.4E-07	4.7E-08	9.3E-08	NV	8.8E-06	1.2E-06	9.3E-08	NV	7.6E-06	4.8E-07
Polycyclic Aromatic Hydrocarbons																
1-Methyl naphthalene	5.2E-10	4.2E-10	7.4E-08	6.6E-09	5.2E-10	4.2E-10	6.3E-08	2.7E-09	4.5E-11	4.2E-10	6.5E-09	5.8E-10	4.5E-11	4.2E-10	5.6E-09	2.4E-10
2-Methyl naphthalene	3.9E-10	4.1E-10	5.5E-08	4.9E-09	3.9E-10	4.1E-10	4.8E-08	2.0E-09	4.2E-11	4.1E-10	6.1E-09	5.4E-10	4.2E-11	4.1E-10	5.2E-09	2.2E-10
Acenaphthene	2.7E-11	1.3E-10	3.9E-09	3.5E-10	2.7E-11	1.3E-10	3.4E-09	1.4E-10	2.9E-11	1.3E-10	4.1E-09	3.7E-10	2.9E-11	1.3E-10	3.5E-09	1.5E-10
Acenaphthylene	8.4E-11	NV	1.2E-08	1.1E-09	8.4E-11	NV	1.0E-08	4.4E-10	5.9E-11	NV	8.4E-09	7.5E-10	5.9E-11	NV	7.2E-09	3.1E-10
Anthracene	4.7E-11	8.9E-11	6.7E-09	6.0E-10	4.7E-11	8.9E-11	5.8E-09	2.5E-10	3.9E-11	8.9E-11	5.6E-09	5.0E-10	3.9E-11	8.9E-11	4.8E-09	2.1E-10
Benzo (a) anthracene	6.0E-10	7.0E-11	8.6E-08	7.6E-09	6.0E-10	7.0E-11	7.4E-08	3.2E-09	4.8E-10	7.0E-11	6.9E-08	6.1E-09	4.8E-10	7.0E-11	5.9E-08	2.5E-09
Benzo (a) pyrene	1.1E-09	NV	1.6E-07	1.4E-08	1.1E-09	NV	1.4E-07	6.0E-09	8.1E-10	NV	1.2E-07	1.0E-08	8.1E-10	NV	9.9E-08	4.2E-09
Benzo (b) fluoranthene	4.1E-09	NV	5.8E-07	5.2E-08	4.1E-09	NV	5.0E-07	2.1E-08	2.8E-09	NV	4.0E-07	3.6E-08	2.8E-09	NV	3.5E-07	1.5E-08
Benzo (ghi) perylene	5.9E-10	NV	8.5E-08	7.5E-09	5.9E-10	NV	7.3E-08	3.1E-09	4.9E-10	NV	7.1E-08	6.3E-09	4.9E-10	NV	6.1E-08	2.6E-09
Benzo (k) fluoranthene	1.6E-09	NV	2.3E-07	2.0E-08	1.6E-09	NV	2.0E-07	8.3E-09	1.1E-09	NV	1.5E-07	1.4E-08	1.1E-09	NV	1.3E-07	5.6E-09
Chrysene	1.4E-09	NV	2.0E-07	1.8E-08	1.4E-09	NV	1.7E-07	7.2E-09	9.5E-10	NV	1.4E-07	1.2E-08	9.5E-10	NV	1.2E-07	5.0E-09
Dibenzo (a,h) anthracene	5.2E-10	NV	7.5E-08	6.7E-09	5.2E-10	NV	6.4E-08	2.7E-09	3.6E-10	NV	5.1E-08	4.5E-09	3.6E-10	NV	4.4E-08	1.9E-09
Fluoranthene	8.9E-10	NV	1.3E-07	1.1E-08	8.9E-10	NV	1.1E-07	4.6E-09	7.7E-10	NV	1.1E-07	9.8E-09	7.7E-10	NV	9.5E-08	4.1E-09
Fluorene	3.2E-11	5.6E-11	4.5E-09	4.0E-10	3.2E-11	5.6E-11	3.9E-09	1.7E-10	2.4E-11	5.6E-11	3.4E-09	3.0E-10	2.4E-11	5.6E-11	2.9E-09	1.3E-10
Indeno (1,2,3-cd) pyrene	5.6E-10	NV	8.0E-08	7.1E-09	5.6E-10	NV	6.8E-08	2.9E-09	4.3E-10	NV	6.1E-08	5.4E-09	4.3E-10	NV	5.2E-08	2.2E-09
Naphthalene	5.2E-11	3.2E-10	7.4E-09	6.6E-10	5.2E-11	3.2E-10	6.3E-09	2.7E-10	3.0E-11	3.2E-10	4.3E-09	3.8E-10	3.0E-11	3.2E-10	3.7E-09	1.6E-10
Phenanthrene	3.1E-10	NV	4.4E-08	3.9E-09	3.1E-10	NV	3.8E-08	1.6E-09	2.4E-10	NV	3.5E-08	3.1E-09	2.4E-10	NV	3.0E-08	1.3E-09
Pyrene	8.6E-10	2.2E-10	1.2E-07	1.1E-08	8.6E-10	2.2E-10	1.1E-07	4.5E-09	7.2E-10	2.2E-10	1.0E-07	9.2E-09	7.2E-10	2.2E-10	8.9E-08	3.8E-09
B(a)P Equivalent	NA	NV	NA	NA	NA	NV	NA	NA	NA	NV	NA	NA	NA	NV	NA	NA
Pesticides																
4,4-DDE	1.0E-11	4.2E-12	4.9E-10	1.3E-10	1.0E-11	4.2E-12	4.2E-10	5.4E-11	1.0E-11	4.2E-12	4.9E-10	1.3E-10	1.0E-11	4.2E-12	4.2E-10	5.4E-11
Polychlorinated Biphenyls																
Total PCBs	9.7E-10	9.5E-10	1.4E-07	1.2E-08	9.7E-10	9.5E-10	1.2E-07	5.1E-09	1.1E-09	9.5E-10	1.6E-07	1.4E-08	1.1E-09	9.5E-10	1.4E-07	5.9E-09
Total Petroleum Hydrocarbons																
TPH as diesel	8.8E-07	1.2E-04	8.4E-05	1.1E-05	8.8E-07	1.2E-04	7.2E-05	4.6E-06	6.8E-07	1.2E-04	6.5E-05	8.7E-06	6.8E-07	1.2E-04	5.6E-05	3.6E-06
TPH as motor oil	2.0E-06	NV	1.9E-04	2.6E-05	2.0E-06	NV	1.6E-04	1.1E-05	1.7E-06	NV	1.6E-04	2.1E-05	1.7E-06	NV	1.4E-04	8.7E-06

Table AOC9-B2.2c
Baseline Scenario Exposure Concentration and Dose Calculations for Noncarcinogenic Effects for C O P Cs in AOC 9 Soil Using Area-Weighted EPCs:
Recreational User - Off-Highway Vehicle Rider

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)	Child OHV Rider (0 to 3 feet bgs)a Soil Pathway EC: Particulate Inhalation (mg/m^3)	Child OHV Rider (0 to 3 feet bgs)a Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Child OHV Rider (0 to 3 feet bgs)a Soil Pathway CDI: Dermal Contact (mg/kg-day)	Child OHV Rider (0 to 3 feet bgs)a Soil Pathway CDI: Ingestion (mg/kg-day)	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway EC: Particulate Inhalation (mg/m^3)	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway EC: Outdoor Vapor Inhalation (mg/m^3)	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway CDI: Dermal Contact (mg/kg-day)	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway CDI: Ingestion (mg/kg-day)
Dioxins/Furans																
TEQ Human	3.4E-13	2.0E-13	9.7E-12	4.3E-12	3.4E-13	2.0E-13	8.4E-12	1.8E-12	2.3E-13	2.0E-13	6.5E-12	2.9E-12	2.3E-13	2.0E-13	5.6E-12	1.2E-12

Notes:
[a] EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
CDI = Chronic Daily Intake.
C O P C = Constituent of Potential Concern.
EC = Exposure Concentration.
mg/kg-day = milligrams per kilogram per day.
mg/m^3 = milligrams per cubic meter.
na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/ E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.
NA = Not applicable. Noncancer effects of carcinogenic polycyclic aromatic hydrocarbons (CPAHs) are evaluated separately for each chemical (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene).
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC9-B2.3a
Baseline Scenario ILCRs for C O P Cs in AOC 9 Soil Using Area-Weighted EPCs: Recreational User- Camper

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Total Cancer Risk	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Total Cancer Risk
Inorganics										
Antimony	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Arsenic	1.1E-10	NV	1.3E-07	1.4E-06	1.5E-06	1.1E-10	NV	1.3E-07	1.4E-06	1.5E-06
Chromium, Hexavalent	5.3E-09	NV	NA	1.6E-07	1.6E-07	3.5E-09	NV	NA	1.1E-07	1.1E-07
Chromium, total	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Copper	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Lead	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Nickel	2.6E-11	NV	NC	NC	2.6E-11	2.6E-11	NV	NC	NC	2.6E-11
Thallium	ND	NC	ND	ND	--	NC	NC	NC	NC	--
Zinc	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Volatile Organic Compounds										
Isophorone	NC	NC	2.8E-11	8.7E-11	1.2E-10	NC	NC	2.9E-10	8.9E-10	1.2E-09
Polycyclic Aromatic Hydrocarbons										
1-Methyl naphthalene	1.2E-14	1.6E-11	1.3E-10	2.7E-10	4.1E-10	1.1E-15	1.6E-11	1.1E-11	2.3E-11	5.1E-11
2-Methyl naphthalene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Acenaphthene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Acenaphthylene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Anthracene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Benzo (a) anthracene	NA	6.4E-11	NA	NA	6.4E-11	NA	6.4E-11	NA	NA	6.4E-11
Benzo (a) pyrene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Benzo (b) fluoranthene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Benzo (ghi) perylene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Benzo (k) fluoranthene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Chrysene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Dibenzo (a,h) anthracene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Fluoranthene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Fluorene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Indeno (1,2,3-cd) pyrene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Naphthalene	3.3E-15	3.2E-11	3.0E-11	6.3E-11	1.3E-10	1.9E-15	3.2E-11	1.8E-11	3.6E-11	8.6E-11
Phenanthrene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Pyrene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
B(a)P Equivalent	1.2E-11	NV	4.4E-08	9.7E-08	1.4E-07	8.5E-12	NV	3.2E-08	7.0E-08	1.0E-07
Pesticides										
4,4-DDE	1.9E-15	1.2E-12	5.7E-12	3.6E-11	4.3E-11	1.9E-15	1.2E-12	5.7E-12	3.6E-11	4.3E-11

Table AOC9-B2.3a
Baseline Scenario ILCRs for C O P Cs in AOC 9 Soil Using Area-Weighted EPCs: Recreational User- Camper

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Age-Adjusted Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Total Cancer Risk	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Age-Adjusted Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Total Cancer Risk
Polychlorinated Biphenyls										
Total PCBs	1.8E-13	2.8E-10	9.5E-09	2.0E-08	2.9E-08	2.1E-13	2.8E-10	1.1E-08	2.3E-08	3.4E-08
Total Petroleum Hydrocarbons										
TPH as diesel	NC	NC	NC	NC	--	NC	NC	NC	NC	--
TPH as motor oil	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Dioxins/Furans										
TEQ Human	2.4E-11	2.3E-08	4.3E-08	4.5E-07	5.2E-07	1.6E-11	2.3E-08	2.9E-08	3.0E-07	3.5E-07
Cumulative ILCR	**5E-09**	**2E-08**	**2E-07**	**2E-06**	**2E-06**	**4E-09**	**2E-08**	**2E-07**	**2E-06**	**2E-06**

Notes:
[a] EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
-- = not calculated.
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
C O P C = Constituent of Potential Concern.
mg/m^3 = milligrams per cubic meter.
na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/ E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.

NA = Not applicable. Carcinogenic polycyclic aromatic hydrocarbons (CPAHs) are evaluated using benzo(a)pyrene equivalents. Hexavalent chromium is not absorbed via dermal contact.
NC = Not considered a carcinogen.
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC9-B2.3b
Baseline Scenario ILCRs for C O P Cs in AOC 9 Soil Using Area-Weighted EPCs: Recreational User - Hiker

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Total Cancer Risk	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Total Cancer Risk
Inorganics										
Antimony	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Arsenic	2.3E-10	NV	2.7E-07	2.8E-06	3.0E-06	2.2E-10	NV	2.6E-07	2.7E-06	3.0E-06
Chromium, Hexavalent	1.1E-08	NV	NA	3.2E-07	3.3E-07	7.0E-09	NV	NA	2.1E-07	2.2E-07
Chromium, total	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Copper	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Lead	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Nickel	5.2E-11	NV	NC	NC	5.2E-11	5.1E-11	NV	NC	NC	5.1E-11
Thallium	ND	NC	ND	ND	--	NC	NC	NC	NC	--
Zinc	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Volatile Organic Compounds										
Isophorone	NC	NC	5.6E-11	1.7E-10	2.3E-10	NC	NC	5.7E-10	1.8E-09	2.4E-09
Polycyclic Aromatic Hydrocarbons										
1-Methyl naphthalene	2.4E-14	3.2E-11	2.6E-10	5.4E-10	8.3E-10	2.1E-15	3.2E-11	2.3E-11	4.7E-11	1.0E-10
2-Methyl naphthalene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Acenaphthene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Acenaphthylene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Anthracene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Benzo (a) anthracene	NA	1.3E-10	NA	NA	1.3E-10	NA	1.3E-10	NA	NA	1.3E-10
Benzo (a) pyrene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Benzo (b) fluoranthene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Benzo (ghi) perylene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Benzo (k) fluoranthene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Chrysene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Dibenzo (a,h) anthracene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Fluoranthene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Fluorene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Indeno (1,2,3-cd) pyrene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Naphthalene	6.5E-15	6.4E-11	6.1E-11	1.3E-10	2.5E-10	3.8E-15	6.4E-11	3.5E-11	7.3E-11	1.7E-10
Phenanthrene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Pyrene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
B(a)P Equivalent	2.4E-11	NV	8.9E-08	1.9E-07	2.8E-07	1.7E-11	NV	6.4E-08	1.4E-07	2.0E-07
Pesticides										
4,4-DDE	3.7E-15	2.4E-12	1.1E-11	7.2E-11	8.5E-11	3.7E-15	2.4E-12	1.1E-11	7.2E-11	8.5E-11

Table AOC9-B2.3b
Baseline Scenario ILCRs for C O P Cs in AOC 9 Soil Using Area-Weighted EPCs: Recreational User - Hiker

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Age-Adjusted Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Total Cancer Risk	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Age-Adjusted Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Total Cancer Risk
Polychlorinated Biphenyls										
Total PCBs	3.6E-13	5.7E-10	1.9E-08	3.9E-08	5.9E-08	4.1E-13	5.7E-10	2.2E-08	4.6E-08	6.8E-08
Total Petroleum Hydrocarbons										
TPH as diesel	NC	NC	NC	NC	--	NC	NC	NC	NC	--
TPH as motor oil	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Dioxins/Furans										
TEQ Human	4.8E-11	4.6E-08	8.7E-08	9.0E-07	1.0E-06	3.2E-11	4.6E-08	5.8E-08	6.0E-07	7.1E-07
Cumulative ILCR	**1E-08**	**5E-08**	**5E-07**	**4E-06**	**5E-06**	**7E-09**	**5E-08**	**4E-07**	**4E-06**	**4E-06**

Notes:
[a] EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
-- = not calculated.
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
C O P C = Constituent of Potential Concern.
mg/m^3 = milligrams per cubic meter.
na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/ E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.

NA = Not applicable. Carcinogenic polycyclic aromatic hydrocarbons (CPAHs) are evaluated using benzo(a)pyrene equivalents. Hexavalent chromium is not absorbed via dermal contact.
NC = Not considered a carcinogen.
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC9-B2.3c
Baseline Scenario ILCRs for C O P Cs in AOC 9 Soil Using Area-Weighted EPCs: Recreational User - Off-Highway Vehicle Rider

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Total Cancer Risk	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Total Cancer Risk
Inorganics										
Antimony	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Arsenic	2.3E-08	NV	1.3E-06	3.5E-07	1.7E-06	2.3E-08	NV	1.3E-06	3.5E-07	1.6E-06
Chromium, Hexavalent	6.8E-07	NV	NA	1.9E-08	7.0E-07	4.5E-07	NV	NA	1.2E-08	4.6E-07
Chromium, total	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Copper	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Lead	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Nickel	5.2E-09	NV	NC	NC	5.2E-09	5.1E-09	NV	NC	NC	5.1E-09
Thallium	ND	NC	ND	ND	--	NC	NC	NC	NC	--
Zinc	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Volatile Organic Compounds										
Isophorone	NC	NC	2.7E-10	2.2E-11	2.9E-10	NC	NC	2.8E-09	2.3E-10	3.0E-09
Polycyclic Aromatic Hydrocarbons										
1-Methyl naphthalene	2.5E-12	2.0E-12	1.2E-09	6.8E-11	1.3E-09	2.1E-13	2.0E-12	1.1E-10	6.0E-12	1.2E-10
2-Methyl naphthalene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Acenaphthene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Acenaphthylene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Anthracene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Benzo (a) anthracene	NA	5.1E-12	NA	NA	5.1E-12	NA	5.1E-12	NA	NA	5.1E-12
Benzo (a) pyrene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Benzo (b) fluoranthene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Benzo (ghi) perylene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Benzo (k) fluoranthene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Chrysene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Dibenzo (a,h) anthracene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Fluoranthene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Fluorene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Indeno (1,2,3-cd) pyrene	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Naphthalene	6.5E-13	4.0E-12	2.9E-10	1.6E-11	3.1E-10	3.8E-13	4.0E-12	1.7E-10	9.3E-12	1.8E-10
Phenanthrene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Pyrene	NC	NC	NC	NC	--	NC	NC	NC	NC	--
B(a)P Equivalent	1.5E-09	NV	1.8E-07	1.1E-08	1.9E-07	1.1E-09	NV	1.3E-07	8.1E-09	1.4E-07
Pesticides										
4,4-DDE	3.7E-13	1.5E-13	5.5E-11	9.1E-12	6.5E-11	3.7E-13	1.5E-13	5.5E-11	9.1E-12	6.5E-11

Table AOC9-B2.3c
Baseline Scenario ILCRs for C O P Cs in AOC 9 Soil Using Area-Weighted EPCs: Recreational User - Off-Highway Vehicle Rider

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Age-Adjusted Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Total Cancer Risk	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Age-Adjusted Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Total Cancer Risk
Polychlorinated Biphenyls										
Total PCBs	3.6E-11	3.5E-11	9.1E-08	5.0E-09	9.7E-08	4.2E-11	3.5E-11	1.1E-07	5.8E-09	1.1E-07
Total Petroleum Hydrocarbons										
TPH as diesel	NC	NC	NC	NC	--	NC	NC	NC	NC	--
TPH as motor oil	NC	NC	NC	NC	--	NC	NC	NC	NC	--
Dioxins/Furans										
TEQ Human	4.8E-09	2.9E-09	4.2E-07	1.1E-07	5.4E-07	3.2E-09	2.9E-09	2.8E-07	7.7E-08	3.6E-07
Cumulative ILCR	**7E-07**	**3E-09**	**2E-06**	**5E-07**	**3E-06**	**5E-07**	**3E-09**	**2E-06**	**5E-07**	**3E-06**

Notes:
[a] EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
-- = not calculated.
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
C O P C = Constituent of Potential Concern.
mg/m^3 = milligrams per cubic meter.
na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/ E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.

NA = Not applicable. Carcinogenic polycyclic aromatic hydrocarbons (CPAHs) are evaluated using benzo(a)pyrene equivalents. Hexavalent chromium is not absorbed via dermal contact.
NC = Not considered a carcinogen.
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC9-B2.4a
Baseline Scenario HIs for C O P Cs in AOC 9 Soil Using Area-Weighted EPCs: Recreational User - Camper

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway Total Hazard Index	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Total Hazard Index	Child Camper (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Child Camper (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Child Camper (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Child Camper (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Child Camper (0 to 3 feet bgs)[a] Soil Pathway Total Hazard Index	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Total Hazard Index
Inorganics																				
Antimony	8.1E-07	NV	3.2E-04	1.1E-02	1.1E-02	8.1E-07	NV	4.3E-05	1.0E-03	1.1E-03	5.5E-07	NV	2.2E-04	7.5E-03	7.7E-03	5.5E-07	NV	3.0E-05	7.1E-04	7.4E-04
Arsenic	4.8E-06	NV	3.2E-02	3.7E-01	4.0E-01	4.8E-06	NV	4.4E-03	3.5E-02	3.9E-02	4.7E-06	NV	3.2E-02	3.6E-01	4.0E-01	4.7E-06	NV	4.3E-03	3.4E-02	3.9E-02
Chromium, Hexavalent	3.4E-07	NV	NA	2.1E-04	2.1E-04	3.4E-07	NV	NA	2.0E-05	2.0E-05	2.3E-07	NV	NA	1.4E-04	1.4E-04	2.3E-07	NV	NA	1.3E-05	1.3E-05
Chromium, total	1.2E-05	NV	2.6E-07	9.0E-06	2.2E-05	1.2E-05	NV	3.6E-08	8.4E-07	1.3E-05	9.7E-06	NV	2.0E-07	7.0E-06	1.7E-05	9.7E-06	NV	2.8E-08	6.6E-07	1.0E-05
Copper	4.4E-09	NV	9.2E-06	3.2E-04	3.3E-04	4.4E-09	NV	1.3E-06	3.0E-05	3.1E-05	3.5E-09	NV	7.4E-06	2.5E-04	2.6E-04	3.5E-09	NV	1.0E-06	2.4E-05	2.5E-05
Iron	2E-07	NV	NA	1E-02	1E-02	2E-07	NV	NA	1E-03	1E-03	2E-07	NV	NA	1E-02	1E-02	2E-07	NV	NA	1E-03	1E-03
Lead	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	2.5E-06	NV	2.4E-04	8.4E-03	8.7E-03	2.5E-06	NV	3.3E-05	7.9E-04	8.3E-04	1.2E-06	NV	1.1E-04	3.9E-03	4.0E-03	1.2E-06	NV	1.6E-05	3.7E-04	3.8E-04
Nickel	1.9E-05	NV	1.3E-05	4.4E-04	4.8E-04	1.9E-05	NV	1.8E-06	4.2E-05	6.3E-05	1.9E-05	NV	1.3E-05	4.4E-04	4.7E-04	1.9E-05	NV	1.7E-06	4.1E-05	6.1E-05
Thallium	ND	NV	ND	ND	--	ND	NV	ND	ND	--	6.1E-07	NV	1.3E-03	4.4E-02	4.6E-02	6.1E-07	NV	1.8E-04	4.2E-03	4.3E-03
Zinc	1.7E-09	NV	3.6E-06	1.2E-04	1.3E-04	1.7E-09	NV	4.9E-07	1.2E-05	1.2E-05	1.7E-09	NV	3.5E-06	1.2E-04	1.2E-04	1.7E-09	NV	4.7E-07	1.1E-05	1.2E-05
Volatile Organic Compounds																				
Isophorone	2.3E-11	NV	1.2E-06	4.1E-06	5.3E-06	2.3E-11	NV	1.6E-07	3.8E-07	5.5E-07	2.3E-10	NV	1.2E-05	4.2E-05	5.4E-05	2.3E-10	NV	1.7E-06	3.9E-06	5.6E-06
Polycyclic Aromatic Hydrocarbons																				
1-Methyl naphthalene	9.2E-12	1.2E-08	2.9E-07	6.7E-07	9.7E-07	9.2E-12	1.2E-08	4.0E-08	6.3E-08	1.1E-07	8.1E-13	1.2E-08	2.5E-08	5.8E-08	9.6E-08	8.1E-13	1.2E-08	3.5E-09	5.5E-09	2.1E-08
2-Methyl naphthalene	1.2E-10	2.1E-07	3.8E-06	8.8E-06	1.3E-05	1.2E-10	2.1E-07	5.2E-07	8.2E-07	1.5E-06	1.3E-11	2.1E-07	4.2E-07	9.6E-07	1.6E-06	1.3E-11	2.1E-07	5.7E-08	9.0E-08	3.5E-07
Acenaphthene	5.7E-13	4.3E-09	1.8E-08	4.1E-08	6.4E-08	5.7E-13	4.3E-09	2.5E-09	3.9E-09	1.1E-08	6.0E-13	4.3E-09	1.9E-08	4.3E-08	6.6E-08	6.0E-13	4.3E-09	2.6E-09	4.1E-09	1.1E-08
Acenaphthylene	1.7E-12	NV	5.5E-08	1.3E-07	1.8E-07	1.7E-12	NV	7.5E-09	1.2E-08	1.9E-08	1.2E-12	NV	3.9E-08	8.9E-08	1.3E-07	1.2E-12	NV	5.3E-09	8.3E-09	1.4E-08
Anthracene	2.0E-13	5.9E-10	6.2E-09	1.4E-08	2.1E-08	2.0E-13	5.9E-10	8.4E-10	1.3E-09	2.8E-09	1.6E-13	5.9E-10	5.2E-09	1.2E-08	1.8E-08	1.6E-13	5.9E-10	7.1E-10	1.1E-09	2.4E-09
Benzo (a) anthracene	2.5E-11	4.7E-09	7.9E-07	1.8E-06	2.6E-06	2.5E-11	4.7E-09	1.1E-07	1.7E-07	2.8E-07	2.0E-11	4.7E-09	6.3E-07	1.5E-06	2.1E-06	2.0E-11	4.7E-09	8.6E-08	1.4E-07	2.3E-07
Benzo (a) pyrene	2.8E-06	NV	1.5E-04	3.4E-04	4.9E-04	2.8E-06	NV	2.0E-05	3.2E-05	5.5E-05	2.0E-06	NV	1.1E-04	2.4E-04	3.5E-04	2.0E-06	NV	1.4E-05	2.3E-05	3.9E-05
Benzo (b) fluoranthene	1.7E-10	NV	5.4E-06	1.2E-05	1.8E-05	1.7E-10	NV	7.3E-07	1.2E-06	1.9E-06	1.2E-10	NV	3.7E-06	8.5E-06	1.2E-05	1.2E-10	NV	5.0E-07	7.9E-07	1.3E-06
Benzo (ghi) perylene	2.5E-11	NV	7.8E-07	1.8E-06	2.6E-06	2.5E-11	NV	1.1E-07	1.7E-07	2.7E-07	2.1E-11	NV	6.5E-07	1.5E-06	2.1E-06	2.1E-11	NV	8.8E-08	1.4E-07	2.3E-07
Benzo (k) fluoranthene	6.6E-11	NV	2.1E-06	4.8E-06	6.9E-06	6.6E-11	NV	2.8E-07	4.5E-07	7.3E-07	4.4E-11	NV	1.4E-06	3.2E-06	4.6E-06	4.4E-11	NV	1.9E-07	3.0E-07	4.9E-07
Chrysene	5.7E-11	NV	1.8E-06	4.1E-06	6.0E-06	5.7E-11	NV	2.5E-07	3.9E-07	6.4E-07	4.0E-11	NV	1.3E-06	2.9E-06	4.1E-06	4.0E-11	NV	1.7E-07	2.7E-07	4.4E-07
Dibenzo (a,h) anthracene	1.3E-06	NV	6.9E-05	1.6E-04	2.3E-04	1.3E-06	NV	9.4E-06	1.5E-05	2.5E-05	8.9E-07	NV	4.7E-05	1.1E-04	1.5E-04	8.9E-07	NV	6.4E-06	1.0E-05	1.7E-05
Fluoranthene	2.8E-11	NV	8.7E-07	2.0E-06	2.9E-06	2.8E-11	NV	1.2E-07	1.9E-07	3.1E-07	2.4E-11	NV	7.6E-07	1.7E-06	2.5E-06	2.4E-11	NV	1.0E-07	1.6E-07	2.7E-07
Fluorene	9.9E-13	2.8E-09	3.1E-08	7.2E-08	1.1E-07	9.9E-13	2.8E-09	4.3E-09	6.7E-09	1.4E-08	7.5E-13	2.8E-09	2.4E-08	5.4E-08	8.0E-08	7.5E-13	2.8E-09	3.2E-09	5.1E-09	1.1E-08
Indeno (1,2,3-cd) pyrene	2.3E-11	NV	7.3E-07	1.7E-06	2.4E-06	2.3E-11	NV	9.9E-08	1.6E-07	2.6E-07	1.8E-11	NV	5.6E-07	1.3E-06	1.8E-06	1.8E-11	NV	7.6E-08	1.2E-07	2.0E-07
Naphthalene	8.6E-11	8.4E-07	1.0E-07	2.3E-07	1.2E-06	8.6E-11	8.4E-07	1.4E-08	2.2E-08	8.8E-07	5.0E-11	8.4E-07	5.9E-08	1.4E-07	1.0E-06	5.0E-11	8.4E-07	8.0E-09	1.3E-08	8.7E-07
Phenanthrene	1.3E-12	NV	4.1E-08	9.3E-08	1.3E-07	1.3E-12	NV	5.5E-09	8.8E-09	1.4E-08	1.0E-12	NV	3.2E-08	7.4E-08	1.1E-07	1.0E-12	NV	4.4E-09	6.9E-09	1.1E-08
Pyrene	3.6E-11	1.5E-08	1.1E-06	2.6E-06	3.7E-06	3.6E-11	1.5E-08	1.5E-07	2.4E-07	4.1E-07	3.0E-11	1.5E-08	9.5E-07	2.2E-06	3.1E-06	3.0E-11	1.5E-08	1.3E-07	2.0E-07	3.5E-07
B(a)P Equivalent	NA	NV	NA	NA	--	NA	NV	NA	NA	--	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Pesticides																				
4,4-DDE	2.6E-11	1.7E-08	2.7E-07	1.9E-06	2.2E-06	2.6E-11	1.7E-08	3.7E-08	1.8E-07	2.3E-07	2.6E-11	1.7E-08	2.7E-07	1.9E-06	2.2E-06	2.6E-11	1.7E-08	3.7E-08	1.8E-07	2.3E-07
Polychlorinated Biphenyls																				
Total PCBs	6.0E-08	9.5E-05	1.9E-03	4.4E-03	6.4E-03	6.0E-08	9.5E-05	2.6E-04	4.1E-04	7.6E-04	7.0E-08	9.5E-05	2.2E-03	5.1E-03	7.4E-03	7.0E-08	9.5E-05	3.0E-04	4.7E-04	8.7E-04
Total Petroleum Hydrocarbons																				
TPH as diesel	1.7E-08	3.6E-03	1.2E-03	4.2E-03	9.0E-03	1.7E-08	3.6E-03	1.6E-04	3.9E-04	4.2E-03	1.3E-08	3.6E-03	9.4E-04	3.2E-03	7.8E-03	1.3E-08	3.6E-03	1.3E-04	3.0E-04	4.1E-03
TPH as motor oil	1.7E-08	NV	3.5E-04	1.2E-03	1.6E-03	1.7E-08	NV	4.8E-05	1.1E-04	1.6E-04	1.4E-08	NV	2.9E-04	1.0E-03	1.3E-03	1.4E-08	NV	4.0E-05	9.4E-05	1.3E-04

Table AOC9-B2.4a
Baseline Scenario HIs for C O P Cs in AOC 9 Soil Using Area-Weighted EPCs: Recreational User - Camper

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Child Camper (0 to 0.5 foot bgs)[a] Soil Pathway Total Hazard Index	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Adult Camper (0 to 0.5 foot bgs)[a] Soil Pathway Total Hazard Index	Child Camper (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Child Camper (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Child Camper (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Child Camper (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Child Camper (0 to 3 feet bgs)[a] Soil Pathway Total Hazard Index	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Adult Camper (0 to 3 feet bgs)[a] Soil Pathway Total Hazard Index
Dioxins/Furans																				
TEQ Human	4.2E-08	4.1E-05	3.8E-03	4.4E-02	4.8E-02	4.2E-08	4.1E-05	5.2E-04	4.1E-03	4.7E-03	2.8E-08	4.1E-05	2.6E-03	2.9E-02	3.2E-02	2.8E-08	4.1E-05	3.5E-04	2.8E-03	3.1E-03
Total Hazard Index	**4E-05**	**4E-03**	**4E-02**	**5E-01**	**5E-01**	**4E-05**	**4E-03**	**6E-03**	**4E-02**	**5E-02**	**4E-05**	**4E-03**	**4E-02**	**5E-01**	**5E-01**	**4E-05**	**4E-03**	**5E-03**	**4E-02**	**5E-02**

Notes:
[a] EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
-- = not calculated.
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
C O P C = Constituent of Potential Concern.
H I = Hazard Index
na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/ E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.
NA = Not applicable. Noncancer effects of carcinogenic polycyclic aromatic hydrocarbons (CPAHs) are evaluated separately for each chemical (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene). Hexavalent chromium is not absorbed via dermal contact.
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC9-B2.4b
Baseline Scenario HIs for C O P Cs in AOC 9 Soil Using Area-Weighted EPCs: Recreational User - Hiker

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

COPC	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Total Hazard Index	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Total Hazard Index	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway Total Hazard Index	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Total Hazard Index
Inorganics																				
Antimony	1.6E-06	NV	6.4E-04	2.2E-02	2.3E-02	1.6E-06	NV	8.7E-05	2.1E-03	2.1E-03	1.1E-06	NV	4.4E-04	1.5E-02	1.5E-02	1.1E-06	NV	6.0E-05	1.4E-03	1.5E-03
Arsenic	9.6E-06	NV	6.5E-02	7.4E-01	8.1E-01	9.6E-06	NV	8.8E-03	7.0E-02	7.9E-02	9.4E-06	NV	6.3E-02	7.3E-01	7.9E-01	9.4E-06	NV	8.7E-03	6.8E-02	7.7E-02
Chromium, Hexavalent	6.9E-07	NV	NA	4.2E-04	4.2E-04	6.9E-07	NV	NA	3.9E-05	4.0E-05	4.6E-07	NV	NA	2.8E-04	2.8E-04	4.6E-07	NV	NA	2.6E-05	2.6E-05
Chromium, total	2.5E-05	NV	5.2E-07	1.8E-05	4.3E-05	2.5E-05	NV	7.1E-08	1.7E-06	2.7E-05	1.9E-05	NV	4.1E-07	1.4E-05	3.4E-05	1.9E-05	NV	5.5E-08	1.3E-06	2.1E-05
Copper	8.8E-09	NV	1.8E-05	6.4E-04	6.6E-04	8.8E-09	NV	2.5E-06	6.0E-05	6.2E-05	7.0E-09	NV	1.5E-05	5.1E-04	5.2E-04	7.0E-09	NV	2.0E-06	4.8E-05	5.0E-05
Iron	4E-07	NV	NA	3E-02	3E-02	4E-07	NV	NA	3E-03	3E-03	4E-07	NV	NA	3E-02	3E-02	4E-07	NV	NA	3E-03	3E-03
Lead	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	5.0E-06	NV	4.9E-04	1.7E-02	1.7E-02	5.0E-06	NV	6.7E-05	1.6E-03	1.7E-03	2.3E-06	NV	2.3E-04	7.9E-03	8.1E-03	2.3E-06	NV	3.1E-05	7.4E-04	7.7E-04
Nickel	3.8E-05	NV	2.6E-05	8.9E-04	9.5E-04	3.8E-05	NV	3.5E-06	8.3E-05	1.3E-04	3.8E-05	NV	2.5E-05	8.7E-04	9.3E-04	3.8E-05	NV	3.4E-06	8.2E-05	1.2E-04
Thallium	ND	NV	ND	ND	--	ND	NV	ND	ND	--	1.2E-06	NV	2.6E-03	8.9E-02	9.1E-02	1.2E-06	NV	3.5E-04	8.3E-03	8.7E-03
Zinc	3.4E-09	NV	7.1E-06	2.5E-04	2.5E-04	3.4E-09	NV	9.7E-07	2.3E-05	2.4E-05	3.3E-09	NV	6.9E-06	2.4E-04	2.5E-04	3.3E-09	NV	9.5E-07	2.2E-05	2.3E-05
Volatile Organic Compounds																				
Isophorone	4.5E-11	NV	2.4E-06	8.2E-06	1.1E-05	4.5E-11	NV	3.2E-07	7.7E-07	1.1E-06	4.6E-10	NV	2.4E-05	8.4E-05	1.1E-04	4.6E-10	NV	3.3E-06	7.8E-06	1.1E-05
Polycyclic Aromatic Hydrocarbons																				
1-Methyl naphthalene	1.8E-11	2.4E-08	5.8E-07	1.3E-06	1.9E-06	1.8E-11	2.4E-08	7.9E-08	1.3E-07	2.3E-07	1.6E-12	2.4E-08	5.1E-08	1.2E-07	1.9E-07	1.6E-12	2.4E-08	6.9E-09	1.1E-08	4.2E-08
2-Methyl naphthalene	2.4E-10	4.1E-07	7.6E-06	1.8E-05	2.6E-05	2.4E-10	4.1E-07	1.0E-06	1.6E-06	3.1E-06	2.6E-11	4.1E-07	8.3E-07	1.9E-06	3.2E-06	2.6E-11	4.1E-07	1.1E-07	1.8E-07	7.1E-07
Acenaphthene	1.1E-12	8.6E-09	3.6E-08	8.3E-08	1.3E-07	1.1E-12	8.6E-09	4.9E-09	7.8E-09	2.1E-08	1.2E-12	8.6E-09	3.8E-08	8.7E-08	1.3E-07	1.2E-12	8.6E-09	5.1E-09	8.1E-09	2.2E-08
Acenaphthylene	3.5E-12	NV	1.1E-07	2.5E-07	3.6E-07	3.5E-12	NV	1.5E-08	2.4E-08	3.9E-08	2.4E-12	NV	7.7E-08	1.8E-07	2.5E-07	2.4E-12	NV	1.1E-08	1.7E-08	2.7E-08
Anthracene	3.9E-13	1.2E-09	1.2E-08	2.8E-08	4.2E-08	3.9E-13	1.2E-09	1.7E-09	2.7E-09	5.5E-09	3.3E-13	1.2E-09	1.0E-08	2.4E-08	3.5E-08	3.3E-13	1.2E-09	1.4E-09	2.2E-09	4.8E-09
Benzo (a) anthracene	5.0E-11	9.4E-09	1.6E-06	3.6E-06	5.2E-06	5.0E-11	9.4E-09	2.2E-07	3.4E-07	5.6E-07	4.0E-11	9.4E-09	1.3E-06	2.9E-06	4.2E-06	4.0E-11	9.4E-09	1.7E-07	2.7E-07	4.5E-07
Benzo (a) pyrene	5.7E-06	NV	3.0E-04	6.9E-04	9.9E-04	5.7E-06	NV	4.1E-05	6.4E-05	1.1E-04	4.0E-06	NV	2.1E-04	4.9E-04	7.0E-04	4.0E-06	NV	2.9E-05	4.6E-05	7.9E-05
Benzo (b) fluoranthene	3.4E-10	NV	1.1E-05	2.5E-05	3.5E-05	3.4E-10	NV	1.5E-06	2.3E-06	3.8E-06	2.3E-10	NV	7.4E-06	1.7E-05	2.4E-05	2.3E-10	NV	1.0E-06	1.6E-06	2.6E-06
Benzo (ghi) perylene	4.9E-11	NV	1.6E-06	3.6E-06	5.1E-06	4.9E-11	NV	2.1E-07	3.3E-07	5.5E-07	4.1E-11	NV	1.3E-06	3.0E-06	4.3E-06	4.1E-11	NV	1.8E-07	2.8E-07	4.6E-07
Benzo (k) fluoranthene	1.3E-10	NV	4.2E-06	9.6E-06	1.4E-05	1.3E-10	NV	5.7E-07	9.0E-07	1.5E-06	8.8E-11	NV	2.8E-06	6.4E-06	9.2E-06	8.8E-11	NV	3.8E-07	6.0E-07	9.8E-07
Chrysene	1.1E-10	NV	3.6E-06	8.3E-06	1.2E-05	1.1E-10	NV	4.9E-07	7.8E-07	1.3E-06	7.9E-11	NV	2.5E-06	5.7E-06	8.2E-06	7.9E-11	NV	3.4E-07	5.4E-07	8.8E-07
Dibenzo (a,h) anthracene	2.6E-06	NV	1.4E-04	3.2E-04	4.6E-04	2.6E-06	NV	1.9E-05	3.0E-05	5.1E-05	1.8E-06	NV	9.3E-05	2.1E-04	3.1E-04	1.8E-06	NV	1.3E-05	2.0E-05	3.5E-05
Fluoranthene	5.5E-11	NV	1.7E-06	4.0E-06	5.7E-06	5.5E-11	NV	2.4E-07	3.8E-07	6.1E-07	4.8E-11	NV	1.5E-06	3.5E-06	5.0E-06	4.8E-11	NV	2.1E-07	3.3E-07	5.3E-07
Fluorene	2.0E-12	5.6E-09	6.2E-08	1.4E-07	2.1E-07	2.0E-12	5.6E-09	8.5E-09	1.3E-08	2.8E-08	1.5E-12	5.6E-09	4.7E-08	1.1E-07	1.6E-07	1.5E-12	5.6E-09	6.4E-09	1.0E-08	2.2E-08
Indeno (1,2,3-cd) pyrene	4.6E-11	NV	1.5E-06	3.4E-06	4.8E-06	4.6E-11	NV	2.0E-07	3.1E-07	5.1E-07	3.5E-11	NV	1.1E-06	2.6E-06	3.7E-06	3.5E-11	NV	1.5E-07	2.4E-07	3.9E-07
Naphthalene	1.7E-10	1.7E-06	2.0E-07	4.7E-07	2.4E-06	1.7E-10	1.7E-06	2.8E-08	4.4E-08	1.8E-06	9.9E-11	1.7E-06	1.2E-07	2.7E-07	2.1E-06	9.9E-11	1.7E-06	1.6E-08	2.5E-08	1.7E-06
Phenanthrene	2.6E-12	NV	8.1E-08	1.9E-07	2.7E-07	2.6E-12	NV	1.1E-08	1.8E-08	2.9E-08	2.0E-12	NV	6.4E-08	1.5E-07	2.1E-07	2.0E-12	NV	8.7E-09	1.4E-08	2.3E-08
Pyrene	7.1E-11	2.9E-08	2.2E-06	5.2E-06	7.4E-06	7.1E-11	2.9E-08	3.1E-07	4.8E-07	8.2E-07	6.0E-11	2.9E-08	1.9E-06	4.4E-06	6.3E-06	6.0E-11	2.9E-08	2.6E-07	4.1E-07	7.0E-07
B(a)P Equivalent	NA	NV	NA	NA	--	NA	NV	NA	NA	--	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Pesticides																				
4,4-DDE	5.2E-11	3.4E-08	5.4E-07	3.7E-06	4.3E-06	5.2E-11	3.4E-08	7.4E-08	3.5E-07	4.6E-07	5.2E-11	3.4E-08	5.4E-07	3.7E-06	4.3E-06	5.2E-11	3.4E-08	7.4E-08	3.5E-07	4.6E-07
Polychlorinated Biphenyls																				
Total PCBs	1.2E-07	1.9E-04	3.8E-03	8.7E-03	1.3E-02	1.2E-07	1.9E-04	5.2E-04	8.2E-04	1.5E-03	1.4E-07	1.9E-04	4.4E-03	1.0E-02	1.5E-02	1.4E-07	1.9E-04	6.0E-04	9.5E-04	1.7E-03
Total Petroleum Hydrocarbons																				
TPH as diesel	3.4E-08	7.3E-03	2.4E-03	8.3E-03	1.8E-02	3.4E-08	7.3E-03	3.3E-04	7.8E-04	8.4E-03	2.6E-08	7.3E-03	1.9E-03	6.5E-03	1.6E-02	2.6E-08	7.3E-03	2.6E-04	6.1E-04	8.2E-03
TPH as motor oil	3.3E-08	NV	7.0E-04	2.4E-03	3.1E-03	3.3E-08	NV	9.6E-05	2.3E-04	3.2E-04	2.8E-08	NV	5.8E-04	2.0E-03	2.6E-03	2.8E-08	NV	7.9E-05	1.9E-04	2.7E-04

Table AOC9-B2.4b
Baseline Scenario HIs for C O P Cs in AOC 9 Soil Using Area-Weighted EPCs: Recreational User - Hiker

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

C O P C	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Child Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Total Hazard Index	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Adult Hiker (0 to 0.5 foot bgs)[a] Soil Pathway Total Hazard Index	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Child Hiker (0 to 3 feet bgs)[a] Soil Pathway Total Hazard Index	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Adult Hiker (0 to 3 feet bgs)[a] Soil Pathway Total Hazard Index
Dioxins/Furans																				
TEQ Human	8.5E-08	8.2E-05	7.6E-03	8.8E-02	9.6E-02	8.5E-08	8.2E-05	1.0E-03	8.2E-03	9.4E-03	5.7E-08	8.2E-05	5.1E-03	5.9E-02	6.4E-02	5.7E-08	8.2E-05	7.0E-04	5.5E-03	6.3E-03
Total Hazard Index	**9E-05**	**8E-03**	**8E-02**	**9E-01**	**1E+00**	**9E-05**	**8E-03**	**1E-02**	**9E-02**	**1E-01**	**8E-05**	**8E-03**	**8E-02**	**9E-01**	**1E+00**	**8E-05**	**8E-03**	**1E-02**	**9E-02**	**1E-01**

Notes:
[a] EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
-- = not calculated.
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
C O P C = Constituent of Potential Concern.
H I = Hazard Index
na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/ E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.
NA = Not applicable. Noncancer effects of carcinogenic polycyclic aromatic hydrocarbons (CPAHs) are evaluated separately for each chemical (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene). Hexavalent chromium is not absorbed via dermal contact.
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC9-B2.4c
Baseline Scenario HIs for C O P Cs in AOC 9 Soil Using Area-Weighted EPCs: Recreational User - Off-Highway Vehicle Rider

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
PG&E Topock Compressor Station
Needles, California

COPC	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Total Hazard Index	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Total Hazard Index	Child OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Child OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Child OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Child OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Child OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Total Hazard Index	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Total Hazard Index
Inorganics																					
Antimony	1.6E-04	NV	1.2E-03	1.5E-03	2.9E-03	1.6E-04	NV	9.9E-04	6.4E-04	1.8E-03	1.1E-04	NV	7.9E-04	1.1E-03	2.0E-03	1.1E-04	NV	6.8E-04	4.4E-04	1.2E-03
Arsenic	9.6E-04	NV	1.2E-01	5.2E-02	1.7E-01	9.6E-04	NV	1.0E-01	2.2E-02	1.2E-01	9.4E-04	NV	1.2E-01	5.1E-02	1.7E-01	9.4E-04	NV	9.9E-02	2.1E-02	1.2E-01
Chromium, Hexavalent	6.9E-05	NV	NA	2.9E-05	9.9E-05	6.9E-05	NV	NA	1.2E-05	8.1E-05	4.6E-05	NV	NA	1.9E-05	6.5E-05	4.6E-05	NV	NA	8.0E-06	5.4E-05
Chromium, total	2.5E-03	NV	9.5E-07	1.3E-06	2.5E-03	2.5E-03	NV	8.1E-07	5.2E-07	2.5E-03	1.9E-03	NV	7.4E-07	9.8E-07	1.9E-03	1.9E-03	NV	6.3E-07	4.1E-07	1.9E-03
Copper	8.8E-07	NV	3.4E-05	4.5E-05	7.9E-05	8.8E-07	NV	2.9E-05	1.8E-05	4.8E-05	7.1E-07	NV	2.7E-05	3.6E-05	6.3E-05	7.1E-07	NV	2.3E-05	1.5E-05	3.9E-05
Iron	4E-05	NV	NA	2E-03	2E-03	4E-05	NV	NA	8E-04	8E-04	4E-05	NV	NA	2E-03	2E-03	4E-05	NV	NA	8E-04	8E-04
Lead	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Mercury (inorganic)	5.0E-04	NV	8.9E-04	1.2E-03	2.6E-03	5.0E-04	NV	7.6E-04	4.9E-04	1.8E-03	2.3E-04	NV	4.1E-04	5.5E-04	1.2E-03	2.3E-04	NV	3.6E-04	2.3E-04	8.1E-04
Nickel	3.9E-03	NV	4.7E-05	6.2E-05	4.0E-03	3.9E-03	NV	4.0E-05	2.6E-05	3.9E-03	3.8E-03	NV	4.6E-05	6.1E-05	3.9E-03	3.8E-03	NV	3.9E-05	2.5E-05	3.9E-03
Thallium	ND	NV	ND	ND	--	ND	NV	ND	ND	--	1.2E-04	NV	4.7E-03	6.2E-03	1.1E-02	1.2E-04	NV	4.0E-03	2.6E-03	6.7E-03
Zinc	3.4E-07	NV	1.3E-05	1.7E-05	3.1E-05	3.4E-07	NV	1.1E-05	7.1E-06	1.9E-05	3.3E-07	NV	1.3E-05	1.7E-05	3.0E-05	3.3E-07	NV	1.1E-05	7.0E-06	1.8E-05
Volatile Organic Compounds																				
Isophorone	4.5E-09	NV	4.3E-06	5.8E-07	4.9E-06	4.5E-09	NV	3.7E-06	2.4E-07	3.9E-06	4.6E-08	NV	4.4E-05	5.9E-06	5.0E-05	4.6E-08	NV	3.8E-05	2.4E-06	4.0E-05
Polycyclic Aromatic Hydrocarbons																				
1-Methyl naphthalene	1.8E-09	1.5E-09	1.1E-06	9.4E-08	1.2E-06	1.8E-09	1.5E-09	9.1E-07	3.9E-08	9.5E-07	1.6E-10	1.5E-09	9.2E-08	8.2E-09	1.0E-07	1.6E-10	1.5E-09	7.9E-08	3.4E-09	8.4E-08
2-Methyl naphthalene	2.4E-08	2.6E-08	1.4E-05	1.2E-06	1.5E-05	2.4E-08	2.6E-08	1.2E-05	5.1E-07	1.2E-05	2.6E-09	2.6E-08	1.5E-06	1.3E-07	1.7E-06	2.6E-09	2.6E-08	1.3E-06	5.6E-08	1.4E-06
Acenaphthene	1.1E-10	5.3E-10	6.5E-08	5.8E-09	7.2E-08	1.1E-10	5.3E-10	5.6E-08	2.4E-09	5.9E-08	1.2E-10	5.3E-10	6.9E-08	6.1E-09	7.5E-08	1.2E-10	5.3E-10	5.9E-08	2.5E-09	6.2E-08
Acenaphthylene	3.5E-10	NV	2.0E-07	1.8E-08	2.2E-07	3.5E-10	NV	1.7E-07	7.3E-09	1.8E-07	2.5E-10	NV	1.4E-07	1.2E-08	1.5E-07	2.5E-10	NV	1.2E-07	5.1E-09	1.3E-07
Anthracene	3.9E-11	7.4E-11	2.2E-08	2.0E-09	2.5E-08	3.9E-11	7.4E-11	1.9E-08	8.3E-10	2.0E-08	3.3E-11	7.4E-11	1.9E-08	1.7E-09	2.1E-08	3.3E-11	7.4E-11	1.6E-08	6.9E-10	1.7E-08
Benzo (a) anthracene	5.0E-09	5.8E-10	2.9E-06	2.5E-07	3.1E-06	5.0E-09	5.8E-10	2.5E-06	1.1E-07	2.6E-06	4.0E-09	5.8E-10	2.3E-06	2.0E-07	2.5E-06	4.0E-09	5.8E-10	2.0E-06	8.4E-08	2.1E-06
Benzo (a) pyrene	5.7E-04	NV	5.4E-04	4.8E-05	1.2E-03	5.7E-04	NV	4.7E-04	2.0E-05	1.1E-03	4.0E-04	NV	3.9E-04	3.4E-05	8.2E-04	4.0E-04	NV	3.3E-04	1.4E-05	7.5E-04
Benzo (b) fluoranthene	3.4E-08	NV	1.9E-05	1.7E-06	2.1E-05	3.4E-08	NV	1.7E-05	7.1E-07	1.7E-05	2.3E-08	NV	1.3E-05	1.2E-06	1.5E-05	2.3E-08	NV	1.2E-05	4.9E-07	1.2E-05
Benzo (ghi) perylene	4.9E-09	NV	2.8E-06	2.5E-07	3.1E-06	4.9E-09	NV	2.4E-06	1.0E-07	2.5E-06	4.1E-09	NV	2.4E-06	2.1E-07	2.6E-06	4.1E-09	NV	2.0E-06	8.6E-08	2.1E-06
Benzo (k) fluoranthene	1.3E-08	NV	7.6E-06	6.7E-07	8.3E-06	1.3E-08	NV	6.5E-06	2.8E-07	6.8E-06	8.9E-09	NV	5.1E-06	4.5E-07	5.5E-06	8.9E-09	NV	4.3E-06	1.9E-07	4.5E-06
Chrysene	1.1E-08	NV	6.6E-06	5.8E-07	7.2E-06	1.1E-08	NV	5.6E-06	2.4E-07	5.9E-06	8.0E-09	NV	4.5E-06	4.0E-07	5.0E-06	8.0E-09	NV	3.9E-06	1.7E-07	4.1E-06
Dibenzo (a,h) anthracene	2.6E-04	NV	2.5E-04	2.2E-05	5.3E-04	2.6E-04	NV	2.1E-04	9.2E-06	4.9E-04	1.8E-04	NV	1.7E-04	1.5E-05	3.6E-04	1.8E-04	NV	1.5E-04	6.2E-06	3.3E-04
Fluoranthene	5.5E-09	NV	3.2E-06	2.8E-07	3.5E-06	5.5E-09	NV	2.7E-06	1.2E-07	2.8E-06	4.8E-09	NV	2.8E-06	2.5E-07	3.0E-06	4.8E-09	NV	2.4E-06	1.0E-07	2.5E-06
Fluorene	2.0E-10	3.5E-10	1.1E-07	1.0E-08	1.2E-07	2.0E-10	3.5E-10	9.7E-08	4.2E-09	1.0E-07	1.5E-10	3.5E-10	8.6E-08	7.6E-09	9.4E-08	1.5E-10	3.5E-10	7.3E-08	3.1E-09	7.7E-08
Indeno (1,2,3-cd) pyrene	4.6E-09	NV	2.7E-06	2.4E-07	2.9E-06	4.6E-09	NV	2.3E-06	9.7E-08	2.4E-06	3.6E-09	NV	2.0E-06	1.8E-07	2.2E-06	3.6E-09	NV	1.7E-06	7.5E-08	1.8E-06
Naphthalene	1.7E-08	1.1E-07	3.7E-07	3.3E-08	5.3E-07	1.7E-08	1.1E-07	3.2E-07	1.4E-08	4.5E-07	1.0E-08	1.1E-07	2.1E-07	1.9E-08	3.5E-07	1.0E-08	1.1E-07	1.8E-07	7.8E-09	3.1E-07
Phenanthrene	2.6E-10	NV	1.5E-07	1.3E-08	1.6E-07	2.6E-10	NV	1.3E-07	5.4E-09	1.3E-07	2.0E-10	NV	1.2E-07	1.0E-08	1.3E-07	2.0E-10	NV	1.0E-07	4.3E-09	1.0E-07
Pyrene	7.1E-09	1.8E-09	4.1E-06	3.6E-07	4.5E-06	7.1E-09	1.8E-09	3.5E-06	1.5E-07	3.7E-06	6.0E-09	1.8E-09	3.5E-06	3.1E-07	3.8E-06	6.0E-09	1.8E-09	3.0E-06	1.3E-07	3.1E-06
B(a)P Equivalent	NA	NV	NA	NA	--	NA	NV	NA	NA	--	NA	NV	NA	NA	--	NA	NV	NA	NA	--
Pesticides																				
4,4-DDE	5.2E-09	2.1E-09	9.9E-07	2.6E-07	1.3E-06	5.2E-09	2.1E-09	8.5E-07	1.1E-07	9.6E-07	5.2E-09	2.1E-09	9.9E-07	2.6E-07	1.3E-06	5.2E-09	2.1E-09	8.5E-07	1.1E-07	9.6E-07
Polychlorinated Biphenyls																				
Total PCBs	1.2E-05	1.2E-05	6.9E-03	6.1E-04	7.5E-03	1.2E-05	1.2E-05	5.9E-03	2.5E-04	6.2E-03	1.4E-05	1.2E-05	8.0E-03	7.1E-04	8.7E-03	1.4E-05	1.2E-05	6.9E-03	2.9E-04	7.2E-03
Total Petroleum Hydrocarbons																				
TPH as diesel	3.4E-06	4.6E-04	4.4E-03	5.9E-04	5.4E-03	3.4E-06	4.6E-04	3.8E-03	2.4E-04	4.5E-03	2.6E-06	4.6E-04	3.4E-03	4.6E-04	4.3E-03	2.6E-06	4.6E-04	2.9E-03	1.9E-04	3.6E-03
TPH as motor oil	3.4E-06	NV	1.3E-03	1.7E-04	1.5E-03	3.4E-06	NV	1.1E-03	7.0E-05	1.2E-03	2.8E-06	NV	1.1E-03	1.4E-04	1.2E-03	2.8E-06	NV	9.1E-04	5.8E-05	9.7E-04

Table AOC9-B2.4c
Baseline Scenario HIs for C O P Cs in AOC 9 Soil Using Area-Weighted EPCs: Recreational User - Off-Highway Vehicle Rider

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PG&E Topock Compressor Station
Needles, California

C O P C	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Child OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Total Hazard Index	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Particulate Inhalation	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Vapor Inhalation	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Dermal Contact	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Ingestion	Adult OHV Rider (0 to 0.5 foot bgs)[a] Soil Pathway Total Hazard Index	Child OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Child OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Child OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Child OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Child OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Total Hazard Index	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Particulate Inhalation	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Vapor Inhalation	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Dermal Contact	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Ingestion	Adult OHV Rider (0 to 3 feet bgs)[a] Soil Pathway Total Hazard Index
Dioxins/Furans																				
TEQ Human	8.5E-06	5.1E-06	1.4E-02	6.2E-03	2.0E-02	8.5E-06	5.1E-06	1.2E-02	2.5E-03	1.4E-02	5.7E-06	5.1E-06	9.3E-03	4.1E-03	1.3E-02	5.7E-06	5.1E-06	8.0E-03	1.7E-03	9.7E-03
Total Hazard Index	**9E-03**	**5E-04**	**1E-01**	**6E-02**	**2E-01**	**9E-03**	**5E-04**	**1E-01**	**3E-02**	**2E-01**	**8E-03**	**5E-04**	**1E-01**	**7E-02**	**2E-01**	**8E-03**	**5E-04**	**1E-01**	**3E-02**	**2E-01**

Notes:
[a] EPCs for exposure to subsurface II soil (0 to 10 feet bgs) are used to evaluate the vapor inhalation pathway.

Abbreviations:
-- = not calculated.
B(a)P equivalent = Benzo(a)pyrene equivalent.
bgs = below ground surface.
C O P C = Constituent of Potential Concern.
H I = Hazard Index
na = Not applicable. Potential exposure to lead is evaluated using California Environmental Protection Agency (Cal/ E P A) Department of Toxic Substances Control's (DTSC) LeadSpread model. Please see text for discussion.
NA = Not applicable. Noncancer effects of carcinogenic polycyclic aromatic hydrocarbons (CPAHs) are evaluated separately for each chemical (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene). Hexavalent chromium is not absorbed via dermal contact.
ND = Not detected.
NV = Not volatile.
PCB = Polychlorinated biphenyls.
TPH = Total Petroleum Hydrocarbons.
TEQ = Toxic Equivalent.

Table AOC9-B2.5a

Baseline Scenario Risk Evaluation for Lead in AOC 9 Surface Soil (0 to 0.5 foot bgs) Using Area-Weighted EPCs: Recreational User (Camper)

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Needles, California

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INPUT MEDIUM	**INPUT** LEVEL
Lead in Soil/Dust (ug/g)	84.6
Respirable Dust (ug/m^3)	1.5

OUTPUT	Percentile Estimate of Blood Pb (ug/dl) 50th	Percentile Estimate of Blood Pb (ug/dl) 90th	Percentile Estimate of Blood Pb (ug/dl) 95th	Percentile Estimate of Blood Pb (ug/dl) 98th	Percentile Estimate of Blood Pb (ug/dl) 99th	PRG-90 (ug/g)
BLOOD Pb, CHILD	0.021	0.039	0.05	0.06	0.06	2159
BLOOD Pb, PICA CHILD	0.043	0.08	0.09	0.11	0.13	1084

EXPOSURE PARAMETERS	units	children
Days per week	days/wk	0.25 [a]
Geometric Standard Deviation	ug/dl	1.6
Blood lead level of concern	ug/dl	1
Skin area, residential	cm^2	2900
Soil adherence	ug/cm^2	200
Dermal uptake constant	(ug/dl)/(ug/day)	0.0001
Soil ingestion	mg/day	100
Soil ingestion, pica	mg/day	200
Ingestion constant	(ug/dl)/(ug/day)	0.16
Bioavailability	unitless	0.44
Breathing rate	m^3/day	6.8
Inhalation constant	(ug/dl)/(ug/day)	0.192

CHILDREN Pathway	typical Pathway contribution PEF	typical Pathway contribution ug/dl	typical Pathway contribution percent	with pica Pathway contribution PEF	with pica Pathway contribution ug/dl	with pica Pathway contribution percent
Soil Contact	2.1E-6	1.8E-04	1%	--	1.8E-04	0.4%
Soil Ingestion	2.5E-4	2.1E-02	99%	5.0E-4	4.3E-02	100%
Inhalation	7.0E-8	5.9E-06	0.03%	--	5.9E-06	0.01%

Notes:

[a] Highlighted values are Site-specific: days per week based on the assumption of 1 day per month (1 day/4 weeks = 0.25 days/week), 8 months per year. See Table 5.1 of the main report for details.

Table AOC9-B2.5b

Baseline Scenario Risk Evaluation for Lead in AOC 9 Shallow Soil (0 to 3 feet bgs) Using Area-Weighted EPCs: Recreational User (Camper)

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
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LEAD RISK ASSESSMENT SPREADSHEET 8
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INPUT MEDIUM	**INPUT** LEVEL
Lead in Soil/Dust (ug/g)	54.7
Respirable Dust (ug/m^3)	1.5

OUTPUT	Percentile Estimate of Blood Pb (ug/dl) 50th	Percentile Estimate of Blood Pb (ug/dl) 90th	Percentile Estimate of Blood Pb (ug/dl) 95th	Percentile Estimate of Blood Pb (ug/dl) 98th	Percentile Estimate of Blood Pb (ug/dl) 99th	PRG-90 (ug/g)
BLOOD Pb, CHILD	0.014	0.025	0.03	0.04	0.04	2159
BLOOD Pb, PICA CHILD	0.028	0.05	0.06	0.07	0.08	1084

EXPOSURE PARAMETERS	units	children
Days per week	days/wk	0.25 [a]
Geometric Standard Deviation	ug/dl	1.6
Blood lead level of concern	ug/dl	1
Skin area, residential	cm^2	2900
Soil adherence	ug/cm^2	200
Dermal uptake constant	(ug/dl)/(ug/day)	0.0001
Soil ingestion	mg/day	100
Soil ingestion, pica	mg/day	200
Ingestion constant	(ug/dl)/(ug/day)	0.16
Bioavailability	unitless	0.44
Breathing rate	m^3/day	6.8
Inhalation constant	(ug/dl)/(ug/day)	0.192

CHILDREN Pathway	typical Pathway contribution PEF	typical Pathway contribution ug/dl	typical Pathway contribution percent	with pica Pathway contribution PEF	with pica Pathway contribution ug/dl	with pica Pathway contribution percent
Soil Contact	2.1E-6	1.1E-04	1%	--	1.1E-04	0.4%
Soil Ingestion	2.5E-4	1.4E-02	99%	5.0E-4	2.8E-02	100%
Inhalation	7.0E-8	3.8E-06	0.03%	--	3.8E-06	0.01%

Notes:

[a] Highlighted values are Site-specific: days per week based on the assumption of 1 day per month (1 day/4 weeks = 0.25 days/week), 8 months per year. See Table 5.1 of the main report for details.

Table AOC9-B2.5c

Baseline Scenario Risk Evaluation for Lead in AOC 9 Surface Soil (0 to 0.5 foot bgs) Using Area-Weighted EPCs: Recreational User (Hiker)

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LEAD RISK ASSESSMENT SPREADSHEET 8
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INPUT MEDIUM	**INPUT** LEVEL
Lead in Soil/Dust (ug/g)	84.6
Respirable Dust (ug/m^3)	1.5

OUTPUT	Percentile Estimate of Blood Pb (ug/dl) 50th	Percentile Estimate of Blood Pb (ug/dl) 90th	Percentile Estimate of Blood Pb (ug/dl) 95th	Percentile Estimate of Blood Pb (ug/dl) 98th	Percentile Estimate of Blood Pb (ug/dl) 99th	PRG-90 (ug/g)
BLOOD Pb, CHILD	0.021	0.039	0.05	0.06	0.06	2159
BLOOD Pb, PICA CHILD	0.043	0.08	0.09	0.11	0.13	1084

EXPOSURE PARAMETERS	units	children
Days per week	days/wk	0.25 [a]
Geometric Standard Deviation	ug/dl	1.6
Blood lead level of concern	ug/dl	1
Skin area, residential	cm^2	2900
Soil adherence	ug/cm^2	200
Dermal uptake constant	(ug/dl)/(ug/day)	0.0001
Soil ingestion	mg/day	100
Soil ingestion, pica	mg/day	200
Ingestion constant	(ug/dl)/(ug/day)	0.16
Bioavailability	unitless	0.44
Breathing rate	m^3/day	6.8
Inhalation constant	(ug/dl)/(ug/day)	0.192

CHILDREN Pathway	typical Pathway contribution PEF	typical Pathway contribution ug/dl	typical Pathway contribution percent	with pica Pathway contribution PEF	with pica Pathway contribution ug/dl	with pica Pathway contribution percent
Soil Contact	2.1E-6	1.8E-04	1%	--	1.8E-04	0.4%
Soil Ingestion	2.5E-4	2.1E-02	99%	5.0E-4	4.3E-02	100%
Inhalation	7.0E-8	5.9E-06	0.03%	--	5.9E-06	0.01%

Notes:

[a] Highlighted values are Site-specific: days per week based on the assumption of 2 days per month (2 days/4 weeks = 0.5 days/week), 8 months per year. See Table 5.1 of the main report for details.

Table AOC9-B2.5d

Baseline Scenario Risk Evaluation for Lead in AOC 9 Shallow Soil (0 to 3 feet bgs) Using Area-Weighted EPCs: Recreational User (Hiker)

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LEAD RISK ASSESSMENT SPREADSHEET 8
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INPUT MEDIUM	**INPUT** LEVEL
Lead in Soil/Dust (ug/g)	54.7
Respirable Dust (ug/m^3)	1.5

OUTPUT	Percentile Estimate of Blood Pb (ug/dl) 50th	Percentile Estimate of Blood Pb (ug/dl) 90th	Percentile Estimate of Blood Pb (ug/dl) 95th	Percentile Estimate of Blood Pb (ug/dl) 98th	Percentile Estimate of Blood Pb (ug/dl) 99th	PRG-90 (ug/g)
BLOOD Pb, CHILD	0.014	0.025	0.03	0.04	0.04	2159
BLOOD Pb, PICA CHILD	0.028	0.05	0.06	0.07	0.08	1084

EXPOSURE PARAMETERS	units	children
Days per week	days/wk	0.25 [a]
Geometric Standard Deviation	ug/dl	1.6
Blood lead level of concern	ug/dl	1
Skin area, residential	cm^2	2900
Soil adherence	ug/cm^2	200
Dermal uptake constant	(ug/dl)/(ug/day)	0.0001
Soil ingestion	mg/day	100
Soil ingestion, pica	mg/day	200
Ingestion constant	(ug/dl)/(ug/day)	0.16
Bioavailability	unitless	0.44
Breathing rate	m^3/day	6.8
Inhalation constant	(ug/dl)/(ug/day)	0.192

CHILDREN Pathway	typical Pathway contribution PEF	typical Pathway contribution ug/dl	typical Pathway contribution percent	with pica Pathway contribution PEF	with pica Pathway contribution ug/dl	with pica Pathway contribution percent
Soil Contact	2.1E-6	1.1E-04	1%	--	1.1E-04	0.4%
Soil Ingestion	2.5E-4	1.4E-02	99%	5.0E-4	2.8E-02	100%
Inhalation	7.0E-8	3.8E-06	0.03%	--	3.8E-06	0.01%

Notes:

[a] Highlighted values are Site-specific: days per week based on the assumption of 2 days per month (2 days/4 weeks = 0.5 days/week), 8 months per year. See Table 5.1 of the main report for details.

Table AOC9-B2.5e

Baseline Scenario Risk Evaluation for Lead in AOC 9 Surface Soil (0 to 0.5 foot bgs) Using Area-Weighted EPCs: Recreational User (Off-Highway Vehicle Rider)

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LEAD RISK ASSESSMENT SPREADSHEET 8
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INPUT MEDIUM	**INPUT** LEVEL
Lead in Soil/Dust (ug/g)	84.6
Respirable Dust (ug/m^3)	1.5

OUTPUT	Percentile Estimate of Blood Pb (ug/dl) 50th	Percentile Estimate of Blood Pb (ug/dl) 90th	Percentile Estimate of Blood Pb (ug/dl) 95th	Percentile Estimate of Blood Pb (ug/dl) 98th	Percentile Estimate of Blood Pb (ug/dl) 99th	PRG-90 (ug/g)
BLOOD Pb, CHILD	0.015	0.027	0.03	0.04	0.04	3180
BLOOD Pb, PICA CHILD	0.086	0.16	0.19	0.23	0.26	535

EXPOSURE PARAMETERS	units	children
Days per week	days/wk	0.5 [a]
Geometric Standard Deviation	ug/dl	1.6
Blood lead level of concern	ug/dl	1
Skin area, residential	cm^2	2900
Soil adherence	ug/cm^2	800 [a]
Dermal uptake constant	(ug/dl)/(ug/day)	0.0001
Soil ingestion	mg/day	31 [a]
Soil ingestion, pica	mg/day	200
Ingestion constant	(ug/dl)/(ug/day)	0.16
Bioavailability	unitless	0.44
Breathing rate	m^3/day	0.425 [a]
Inhalation constant	(ug/dl)/(ug/day)	0.192

CHILDREN Pathway	typical Pathway contribution PEF	typical Pathway contribution ug/dl	typical Pathway contribution percent	with pica Pathway contribution PEF	with pica Pathway contribution ug/dl	with pica Pathway contribution percent
Soil Contact	1.7E-5	1.4E-03	10%	--	1.4E-03	1.6%
Soil Ingestion	1.6E-4	1.3E-02	90%	1.0E-3	8.5E-02	98%
Inhalation	8.7E-9	7.4E-07	0.01%	--	7.4E-07	0.00%

Notes:

[a] Highlighted values are Site-specific: days per week based on the assumption of 2 days per month, 8 months per year. Soil ingestion rate of 330 mg/day is modified by exposure time (1.5 hours riding at site per 16 awake hours, or 0.09). Default inhalation breathing rate of 6.8 m^3/day is modified to account for exposure time (i.e., 1.5 hours riding at site per 24 hours, or 0.06) . See Table 5.1 of the main report for details.

Table AOC9-B2.5f

Baseline Scenario Risk Evaluation for Lead in AOC 9 Shallow Soil (0 to 3 feet bgs) Using Area-Weighted EPCs: Recreational User (Off-Highway Vehicle Rider)

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LEAD RISK ASSESSMENT SPREADSHEET 8
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INPUT MEDIUM	**INPUT** LEVEL
Lead in Soil/Dust (ug/g)	54.7
Respirable Dust (ug/m^3)	1.5

OUTPUT	Percentile Estimate of Blood Pb (ug/dl) 50th	Percentile Estimate of Blood Pb (ug/dl) 90th	Percentile Estimate of Blood Pb (ug/dl) 95th	Percentile Estimate of Blood Pb (ug/dl) 98th	Percentile Estimate of Blood Pb (ug/dl) 99th	PRG-90 (ug/g)
BLOOD Pb, CHILD	0.009	0.017	0.02	0.02	0.03	3180
BLOOD Pb, PICA CHILD	0.056	0.10	0.12	0.15	0.17	535

EXPOSURE PARAMETERS	units	children
Days per week	days/wk	0.5 [a]
Geometric Standard Deviation	ug/dl	1.6
Blood lead level of concern	ug/dl	1
Skin area, residential	cm^2	2900
Soil adherence	ug/cm^2	800 [a]
Dermal uptake constant	(ug/dl)/(ug/day)	0.0001
Soil ingestion	mg/day	31 [a]
Soil ingestion, pica	mg/day	200
Ingestion constant	(ug/dl)/(ug/day)	0.16
Bioavailability	unitless	0.44
Breathing rate	m^3/day	0.425 [a]
Inhalation constant	(ug/dl)/(ug/day)	0.192

CHILDREN Pathway	typical Pathway contribution PEF	typical Pathway contribution ug/dl	typical Pathway contribution percent	with pica Pathway contribution PEF	with pica Pathway contribution ug/dl	with pica Pathway contribution percent
Soil Contact	1.7E-5	9.1E-04	10%	--	9.1E-04	1.6%
Soil Ingestion	1.6E-4	8.5E-03	90%	1.0E-3	5.5E-02	98%
Inhalation	8.7E-9	4.8E-07	0.01%	--	4.8E-07	0.00%

Notes:

[a] Highlighted values are Site-specific: days per week based on the assumption of 2 days per month, 8 months per year. Soil ingestion rate of 330 mg/day is modified by exposure time (1.5 hours riding at site per 16 awake hours, or 0.09). Default inhalation breathing rate of 6.8 m^3/day is modified to account for exposure time (i.e., 1.5 hours riding at site per 24 hours, or 0.06) . See Table 5.1 of the main report for details.

ATTACHMENT C

Dose and Risk Calculations for Ecological Receptors at AOC 9 Using Depth-Weighted EPCs and Area-Weighted EPCs

For additional help with the information provided in Attachment C, please contact Erin Osborn, Arcadis Principal Toxicologist, at 1-510-684-6760.

Table AOC9-C.1

Desert Shrew Risk Calculations Using Depth-Weighted and Area-Weighted Exposure Point Concentrations (Wildlife SUF = 1, TRVs used for RBRG Development, and Selected BAFs) for AOC 9

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Scenario	Category	COPEC	Terrestrial Receptors	TRV Type	Soil EPC (mg/kg or ng/kg)[a]	Diet Composition (Biota)	Diet Composition (Soil Fraction)	Tissue EPCs (mg/kg dw)	Body Weight (kg)	Intake Estimates (F I R) (kg dw/kg-day)	Intake Estimates (S I R) (kg dw/kg-day)
Baseline (Depth-Weighted)	Inorganics	Chromium, hexavalent	Desert Shrew	Selected	3.2E+00	100% Insects	2.0E-02	9.8E-01	5.0E-03	2.0E-01	4.1E-03
Baseline (Depth-Weighted)	Inorganics	Chromium, total	Desert Shrew	Selected	3.8E+01	100% Insects	2.0E-02	1.2E+01	5.0E-03	2.0E-01	4.1E-03
Baseline (Depth-Weighted)	Inorganics	Copper	Desert Shrew	Selected	3.9E+01	100% Insects	2.0E-02	2.0E+01	5.0E-03	2.0E-01	4.1E-03
Baseline (Depth-Weighted)	Dioxins	TEQ Mammals	Desert Shrew	Alternate	1.0E+02	100% Insects	2.0E-02	6.6E+02	5.0E-03	2.0E-01	4.1E-03
Baseline (Area-Weighted)	Inorganics	Chromium, hexavalent	Desert Shrew	Selected	2.1E+00	100% Insects	2.0E-02	6.5E-01	5.0E-03	2.0E-01	4.1E-03
Baseline (Area-Weighted)	Inorganics	Chromium, total	Desert Shrew	Selected	4.6E+01	100% Insects	2.0E-02	1.4E+01	5.0E-03	2.0E-01	4.1E-03
Baseline (Area-Weighted)	Inorganics	Copper	Desert Shrew	Selected	4.4E+01	100% Insects	2.0E-02	2.2E+01	5.0E-03	2.0E-01	4.1E-03
Baseline (Area-Weighted)	Dioxins	TEQ Mammals	Desert Shrew	Alternate	1.1E+02	100% Insects	2.0E-02	6.8E+02	5.0E-03	2.0E-01	4.1E-03

Table AOC9-C.1

Desert Shrew Risk Calculations Using Depth-Weighted and Area-Weighted Exposure Point Concentrations (Wildlife SUF = 1, TRVs used for RBRG Development, and Selected BAFs) for AOC 9

Post-Soil N T C R A Human Health and Ecological Risk Assessment Report
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Scenario	Category	COPEC	Terrestrial Receptors	Site Use Factor (unitless)	Dose (Terrestrial Insects) (mg/kg-day)	Dose (Soil) (mg/kg-day)	Total Dose (mg/kg-day)	N O A E L TRV (mg/kg-day)	L O A E L TRV (mg/kg-day)	N O A E L HQ (unitless)	L O A E L HQ (unitless)	HQ Notes
Baseline (Depth-Weighted)	Inorganics	Chromium, hexavalent	Desert Shrew	1.0E+00	2.0E-01	1.3E-02	2.1E-01	9.2E+00	3.8E+01	2E-02	6E-03	None
Baseline (Depth-Weighted)	Inorganics	Chromium, total	Desert Shrew	1.0E+00	2.4E+00	1.5E-01	2.5E+00	2.4E+00	9.6E+00	1E+00	3E-01	None
Baseline (Depth-Weighted)	Inorganics	Copper	Desert Shrew	1.0E+00	4.1E+00	1.6E-01	4.3E+00	9.4E+00	1.6E+01	5E-01	3E-01	None
Baseline (Depth-Weighted)	Dioxins	TEQ Mammals	Desert Shrew	1.0E+00	1.3E+02	4.2E-01	1.3E+02	4.9E+00	3.0E+01	**3E+01**	**4E+00**	Note 2
Baseline (Area-Weighted)	Inorganics	Chromium, hexavalent	Desert Shrew	1.0E+00	1.3E-01	8.7E-03	1.4E-01	9.2E+00	3.8E+01	2E-02	4E-03	None
Baseline (Area-Weighted)	Inorganics	Chromium, total	Desert Shrew	1.0E+00	2.9E+00	1.9E-01	3.1E+00	2.4E+00	9.6E+00	1E+00	3E-01	None
Baseline (Area-Weighted)	Inorganics	Copper	Desert Shrew	1.0E+00	4.6E+00	1.8E-01	4.7E+00	9.4E+00	1.6E+01	5E-01	3E-01	None
Baseline (Area-Weighted)	Dioxins	TEQ Mammals	Desert Shrew	1.0E+00	1.4E+02	4.3E-01	1.4E+02	4.9E+00	3.0E+01	**3E+01**	**5E+00**	Note 2

Table AOC9-C.1

Desert Shrew Risk Calculations Using Depth-Weighted and Area-Weighted Exposure Point Concentrations (Wildlife SUF = 1, TRVs used for RBRG Development, and Selected BAFs) for AOC 9

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Notes:

[a] Inorganics presented in mg/kg; dioxin presented in ng/kg.
[b] Total dose equation is presented below:

Total Dose (mg/kg-day) = $[(EPC_{soil} \times SIR) + (C_{plants} \times FIR \times F_{plants}) + (C_{insects} \times FIR \times F_{insects}) + (C_{mammals} \times FIR \times F_{mammals})] \times SUF$

[c] HQ = Total Dose / TRV

Note 1	N O A E L HQ greater than 1
Note 2	L O A E L HQ greater than 1
Note 3	L O A E L HQ greater than 10
Note 4	L O A E L HQ greater than 100

Abbreviations:
AOC = area of concern
COPEC = constituent of potential ecological concern
dw = dry weight
EPC_{soil} = exposure point concentration in soil (mg/kg dw)
EPC_{plants} = exposure point concentration in plants (mg/kg dw)
$EPC_{insects}$ = exposure point concentration in insects (mg/kg dw)
$EPC_{mammals}$ = exposure point concentration in mammals (mg/kg dw)
F_{plants} = fraction of plants in diet
$F_{insects}$ = fraction of insects in diet
$F_{mammals}$ = fraction of mammals in diet
FIR = food ingestion rate (kg dw/kg bw-day)
HQ = hazard quotient (unitless)
kg = kilogram
kg dw/kg bw-day = kilograms per kilogram of body weight per day
LOAEL = lowest observed adverse effect level (mg/kg-day)
mg/kg = milligrams per kilogram
mg/kg-day = milligrams per kilogram per day
ND = not detected
ng/kg = nanograms per kilogram
NOAEL = no observed adverse effect level (mg/kg-day)
SIR = soil ingestion rate (kg dw/kg bw-day)
SUF = site use factor (fraction)
TRV = toxicity reference value (mg/kg-day)

Table AOC9-C.2
Desert Shrew Risk Calculations Using Depth-Weighted Exposure Point Concentrations and Congener-Specific BAFs (Wildlife SUF = 1, TRVs used for RBRG Development) for AOC 9

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Scenario	Category	COPEC	Terrestrial Receptors	TRV Type	BAF Type	Soil EPC (mg/kg or ng/kg)[a]	Diet Composition (Biota)	Diet Composition (Soil Fraction)	Tissue EPCs (mg/kg dw)	Body Weight (kg)	Intake Estimates (F I R) (kg dw/kg-day)	Intake Estimates (S I R) (kg dw/kg-day)	Site Use Factor (unitless)
Baseline (Depth-Weighted)	Dioxins	TEQ Mammals	Desert Shrew	Alternate	Congener-Specific (USEPA 1999)	1.0E+02	100% Insects	2.0E-02	4.2E+01	5.0E-03	2.0E-01	4.1E-03	1.0E+00
Baseline (Depth-Weighted)	Dioxins	TEQ Mammals	Desert Shrew	Alternate	Congener-Specific (Fagervold et al. 2010)	1.0E+02	100% Insects	2.0E-02	2.4E+01	5.0E-03	2.0E-01	4.1E-03	1.0E+00

Table AOC9-C.2
Desert Shrew Risk Calculations Using Depth-Weighted Exposure Point Concentrations and Congener-Specific BAFs (Wildlife SUF = 1, TRVs used for RBRG Development) for AOC 9

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Scenario	Category	COPEC	Terrestrial Receptors	Dose (Terrestrial Insects) (mg/kg-day)	Dose (Soil) (mg/kg-day)	Total Dose (mg/kg-day)	N O A E L TRV (mg/kg-day)	L O A E L TRV (mg/kg-day)	N O A E L HQ (unitless)	L O A E L HQ (unitless)	HQ Notes
Baseline (Depth-Weighted)	Dioxins	TEQ Mammals	Desert Shrew	8.5E+00	4.2E-01	8.9E+00	4.9E+00	3.0E+01	**2E+00**	3E-01	Note 1
Baseline (Depth-Weighted)	Dioxins	TEQ Mammals	Desert Shrew	4.8E+00	4.2E-01	5.2E+00	4.9E+00	3.0E+01	1E+00	2E-01	None

Table AOC9-C.2
Desert Shrew Risk Calculations Using Depth-Weighted Exposure Point Concentrations and Congener-Specific BAFs
(Wildlife SUF = 1, TRVs used for RBRG Development) for AOC 9

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Notes:

[a] Inorganics presented in mg/kg; dioxin presented in ng/kg.
[b] Total dose equation is presented below:
Total Dose (mg/kg-day) = [(EPC_{soil} x SIR) + (C_{plants} x FIR x F_{plants}) + ($C_{insects}$ x FIR x $F_{insects}$) + ($C_{mammals}$ x FIR x $F_{mammals}$)] x SUF
[c] HQ = Total Dose / TRV

Note 1	N O A E L HQ greater than 1
Note 2	L O A E L HQ greater than 1
Note 3	L O A E L HQ greater than 10
Note 4	L O A E L HQ greater than 100

Abbreviations:

AOC = area of concern
B A F = bioaccumulation factor
COPEC = constituent of potential ecological concern
dw = dry weight
EPC_{soil} = exposure point concentration in soil (mg/kg dw)
EPC_{plants} = exposure point concentration in plants (mg/kg dw)
$EPC_{insects}$ = exposure point concentration in insects (mg/kg dw)
$EPC_{mammals}$ = exposure point concentration in mammals (mg/kg dw)
F_{plants} = fraction of plants in diet
$F_{insects}$ = fraction of insects in diet
$F_{mammals}$ = fraction of mammals in diet
FIR = food ingestion rate (kg dw/kg bw-day)
HQ = hazard quotient (unitless)
kg = kilogram
kg dw/kg bw-day = kilograms per kilogram of body weight per day
LOAEL = lowest observed adverse effect level (mg/kg-day)
mg/kg = milligrams per kilogram
mg/kg-day = milligrams per kilogram per day
ND = not detected
ng/kg = nanograms per kilogram
NOAEL = no observed adverse effect level (mg/kg-day)
SIR = soil ingestion rate (kg dw/kg bw-day)
SUF = site use factor (fraction)
TRV = toxicity reference value (mg/kg-day)

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