Naval Facilities Engineering Systems Command Northwest
Silverdale, WA

Final

Sixth Five-Year Review

Naval Base Kitsap, Keyport, Washington

November 2025

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Silverdale, WA

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Naval Base Kitsap, Keyport, Washington

November 2025

DCN: LBJV-5006-4053-0006

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Contract Number: N44255-20-D-5006; Task Order No. N4425524F4053

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SIGNATURE PAGE

Signature sheet for the Naval Base Kitsap, Keyport, Washington, Sixth Five-Year Review.

2025 11 21

John Hale
Captain, U.S. Navy
Commanding Officer, Naval Base Kitsap

Date

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Executive Summary

The sixth five-year review (FYR) of remedial actions at Operable Units (OUs) 1 and 2 of Naval Base Kitsap (NBK) Keyport has been completed pursuant to Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9621(c), and Section 300.430(f)(4)(ii) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. § 300.430(f)(4)(ii).

Because hazardous substances, pollutants, or contaminants remain in place at the OUs above levels that allow for unlimited use and unrestricted exposure (UU/UE), a statutory review (i.e., FYR) is required under CERCLA and the NCP. The purpose of a FYR is to determine whether the remedies selected for implementation in the decision document for a site remain protective of human health and the environment. The data review and technical assessment performed and resulting protectiveness determinations are documented in this FYR report, which also identifies issues that affect current and/or future protectiveness of the remedies and provides recommendations to address these issues.

This FYR was initiated in June 2024 and is based on analytical data generated and published in final reports issued between July 2019 and October 2024. This FYR report was prepared as part of the CERCLA FYR process using United States (U.S.) Navy and U.S. Environmental Protection Agency (EPA) guidance (Navy, 2004, 2011, 2013, 2014a; EPA, 2001, 2012, and 2016) and organized in accordance with EPA's 2016 recommended template – streamlined to minimize information that has been presented in the previous FYRs.

In accordance with Navy and EPA guidance, a technical assessment was conducted to determine if: a) the remedies are functioning as intended by the decision documents; b) exposure assumptions, toxicity data, cleanup levels and remedial action objectives (RAOs) identified in the decision documents and used during remedy implementation are still valid and protective; and c) other information has come to light that compromises the protectiveness of the remedies. As a result of the technical assessment, issues or findings (and subsequent recommendations) have been identified for OU 1, OU 2 Area 2, and OU 2 Area 8.

The Navy recognizes per- and polyfluoroalkyl substances (PFAS) as chemicals of emerging concern, and this FYR summarizes the status of the investigations characterizing PFAS in environmental media at NBK Keyport, including:

- 2018 and 2019 PFAS sampling at OU 1 and OU 2 Area 8 as part of the long-term monitoring (LTM) sampling program (Navy, 2019b, 2020g).
- Basewide PFAS preliminary assessment (PA; Navy, 2020e)

- 2021 PFAS sampling at OU 1 (Navy, 2023c)
- Basewide PFAS site investigation (SI; Navy, 2023j)

The remedy at OU 1 is not protective. Exposure pathways identified in the OU 1 Record of Decision (ROD) that could result in unacceptable risks are being controlled and monitored via land use controls (LUCs) while further information is being obtained. However, substantial investigation work was conducted during this FYR period focused on updating the conceptual site model (CSM) and reassessing potential risks to human health and the environment. This work is ongoing, but data and evaluations to date document substantial changes to the CSM and the risk conclusions presented in the OU 1 ROD. The human health risk assessment/ecological risk assessment (HHRA/ERA) addendum that is likely to be finalized shortly after the review period for this FYR is expected to show unacceptable risks not identified in the OU 1 ROD. The ongoing supplemental remedial investigations (RIs) will allow evaluation of potential additional removal or remedial action(s) that could be taken to address these risks, shorten the overall restoration timeframe, and be protective in the long term.

The remedy at OU 2 Area 2 is short-term protective. Known exposure pathways that could result in unacceptable risks are being controlled and monitored via LUCs. However, the additional monitoring wells installed during this FYR period show concentrations of trichloroethene (TCE) several times higher than the highest concentrations documented in the OU 2 ROD, even after 30 years of monitoring. The new wells installed may not be optimally positioned to reliably assess whether migration pathways are known and exposures controlled.

The remedy at OU 2 Area 8 is protective of human health; however, it is not protective of ecological receptors based on a finding of unacceptable risk, for which a contingent remedial action has not yet been implemented as required by the OU 2 ROD. To identify a feasible contingent groundwater control action, the Navy is currently performing a supplemental RI and supporting bench-scale studies, with future near-term plans to perform a focused feasibility study (FFS). Once identified and agreed upon by regulators and stakeholders, the Navy will document the selected contingent groundwater control action in a ROD amendment. The Navy will then perform remedial design and implement additional remedial action to address elevated contaminant of concern (COC) concentrations in intertidal sediment and on-going discharge of these COCs in seep water. The 2018 HHRA for the Area 8 beach intertidal zone concluded that incremental site risk over reference area risk for Suquamish subsistence and recreational receptors meets target health goals, despite COC concentrations in sediment and clam tissue exceeding background and reference area concentrations, respectively. The 2020 ERA addendum for Area 8 concluded that unacceptable risk to higher trophic level species was not present, but acute and chronic exposure to

accumulated contaminants in sediment pose a current potential hazard to benthic organisms based on the bioassay results/endpoints.

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Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name (from WasteLAN): Naval Undersea Warfare Engineering Station (4 Waste Areas)		
EPA ID (from WasteLAN): WA1170023419		
Region: 10	**State:** Washington	**City/County:** Kitsap
SITE STATUS		
NPL Status: Final		
Multiple OUs? Yes	**Has the site achieved construction completion?** Yes, remedy construction is complete for all OUs at NBK Keyport.	
REVIEW STATUS		
Lead agency: Navy		
Author name (Federal or State Project Manager): Amanda Rohrbaugh		
Author affiliation: Naval Facilities Engineering Systems Command (NAVFAC) Northwest		
Review period: November 2024 – November 2025 based on data finalized July 2019 – October 2024		
Date of site inspection: July 17, 2024		
Type of review: Statutory		
Review number: 6 (Sixth)		
Triggering action date: December 2020		
Due date: December 2025		
Issues/Recommendations		
OU(s) without Issues/Recommendations Identified in the Five-Year Review:		
None		
Issues and Recommendations Identified in the Five-Year Review:		
OU(s): 1	**Issue Category:** Remedy Performance	
	Issue: Investigations pursuant to recommendations from the fourth and fifth Five-Year Reviews (FYRs; United States [U.S.] Navy, 2015a, 2020a) have resulted in an updated conceptual site model (CSM) that differs significantly from the understanding at the time of the Operable Unit (OU) 1 Record of Decision (ROD; Navy, U.S. Environmental Protection Agency [EPA], and Washington State Department of Ecology [Ecology], 1998) and continuing investigations are likely to conclude that unacceptable risks to human health and the environment are not being fully controlled by the remedy in place.	

<table>
<tr><td></td><td colspan="4">Recommendation:
1. Complete the on-going investigations to update the CSM elements for off-base transport of contaminants of concern (COCs).
2. Perform additional sampling of deep groundwater wells throughout OU 1 with analysis for polychlorinated biphenyl (PCB) congeners to confirm or refute the presence of PCBs as a COC in deep groundwater.
3. Finalize the updates to the human health and ecological risk assessments using the updated CSM and incorporating the latest guidance and screening levels.
4. In collaboration with the Keyport Project Team, review and revise (as appropriate) the applicable or relevant and appropriate regulations (ARARs), points of compliance, and remedial action objectives (RAOs) as part of a focused feasibility study (FFS).
5. Based on the results of items 1 through 3, evaluate the need for any removal actions and/or an optimized/revised remedy.</td></tr>
<tr><td>Affect Current Protectiveness</td><td>Affect Future Protectiveness</td><td>Party Responsible</td><td>Oversight Party</td><td>Milestone Date</td></tr>
<tr><td>Yes</td><td>Yes</td><td>Navy</td><td>Ecology</td><td>December 2027</td></tr>
<tr><td rowspan="3">OU(s): 1</td><td colspan="4">Issue Category: Remedy Performance</td></tr>
<tr><td colspan="4">Issue: The suspension of long-term monitoring (LTM) and contingent remedial action (CRA) monitoring activities, has been in effect for 7 years while supplemental remedial investigation (RI) activities have been ongoing, although sampling in support of these activities has met or exceeded the historical LTM requirements.</td></tr>
<tr><td colspan="4">Recommendation: Begin developing a revised LTM/CRA Plan concurrent with finalization of Volume 3 of the supplemental RI, and modify that plan based on any final results. Implement the LTM plan promptly once all relevant data are available.</td></tr>
<tr><td>Affect Current Protectiveness</td><td>Affect Future Protectiveness</td><td>Party Responsible</td><td>Oversight Party</td><td>Milestone Date</td></tr>
<tr><td>No</td><td>Yes</td><td>Navy</td><td>Ecology</td><td>December 2026</td></tr>
<tr><td rowspan="3">OU(s): 1</td><td colspan="4">Issue Category: Remedy Performance</td></tr>
<tr><td colspan="4">Issue: The phytoremediation component of the remedy is no longer functioning as intended by the OU 1 ROD, and as the trees reach the end of their lives, they present a hazard to workers at the site. The OU 1 ROD provides for the discontinuation of this remedy component in the event that it is shown to be ineffective.</td></tr>
<tr><td colspan="4">Recommendation:
1. Evaluate the OU 1 ROD to confirm that removal of the phytoremediation trees prior to selection of a revised remedy is allowable.
2. If allowable, to protect site workers from physical hazards, consider cutting the phytoremediation trees at their bases and either consolidating the trunks and limbs in an unused area to remove the tripping hazards, or removing the trees from Naval Base Kitsap (NBK) Keyport entirely. Stumps can be addressed as part of a future remedy optimization, although some resprouting is likely to occur from the stumps. Discontinue associated phytoremediation monitoring.</td></tr>
<tr><td>Affect Current Protectiveness</td><td>Affect Future Protectiveness</td><td>Party Responsible</td><td>Oversight Party</td><td>Milestone Date</td></tr>
<tr><td>Yes</td><td>Yes</td><td>Navy</td><td>Ecology</td><td>December 2025</td></tr>
<tr><td rowspan="2">OU(s): 1</td><td colspan="4">Issue Category: Land Use Controls</td></tr>
<tr><td colspan="4">Issue: The existing WDOH restrictions on shellfish harvesting and consumption are currently preventing human health exposures to seafood harvesters while the ROD amendment process is underway; however, there is no site contaminant-related restrictions.</td></tr>
</table>

	Recommendation: Coordinate with WDOH and the Suquamish Tribe regarding the findings of the HHRA/ERA, the status of WDOH shellfish area classifications in Liberty Bay, and future risk/harvest management decisions.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
Yes	Yes	Navy	Ecology	December 2025
OU(s): 2, Area 2	**Issue Category:** Remedy Performance			
	Issue: The additional monitoring wells installed during this FYR period show concentrations of trichloroethene (TCE) several times higher than the highest concentrations documented in the OU 2 ROD, even after 30 years of monitoring with the expectation of natural attenuation. The new wells installed may not be optimally positioned to reliably assess whether migration pathways are known, and exposures controlled.			
	Recommendation: Comprehensively evaluate the data collected in 2022, 2023, and 2024, as well as the planned drum investigation data, to refine the CSM, including: 1. Verification that the leading edge of the chlorinated volatile organic compound (cVOC) plume, both laterally and vertically, has been delimited, or performance of additional investigation as warranted. Consider the specific investigation recommendations included in Section 4.2.2. 2. Verification that monitoring wells are correctly positioned and screened to effectively monitor migration pathways, or installation of additional wells as needed to provide such monitoring points. 3. Evaluation of the 2024 biodegradation data to conclude whether the natural attenuation anticipated and described in the OU 2 ROD is reasonably expected to meet the RAOs. 4. Incorporation of a complete suite of cVOC breakdown compounds and natural attenuation parameters in future monitoring.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	Navy	Ecology	December 2027
OU(s): 2, Area 8	**Issue Category:** Remedy Performance			
	Issue: As also found in the fifth FYR, based on the ERA conclusion that acute and chronic exposure to accumulated contaminants in sediment poses a current potential hazard to benthic organisms based on the bioassay results/endpoints, implementation of a contingent groundwater control action is required by the selected remedy (Navy, EPA, and Ecology, 1994).			
	Recommendation: Continue progress towards implementation of a contingent groundwater control action. To identify a feasible contingent action, finalize the supplemental RI and perform a FFS. Once identified and agreed upon by regulators and stakeholders, prepare a ROD amendment to document the contingent action to be taken. Perform remedial design, implement the remedial action, and potentially conduct a shoreline repair to address elevated COC concentrations in intertidal sediment and on-going discharge of these COCs in seep water.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
Yes	Yes	Navy	Ecology	December 2030
OU(s): 2, Area 8	**Issue Category:** Protectiveness			
	Issue: During preparation of the work-in-progress supplemental RI, substantial additional data were generated for chemical concentrations in soil and groundwater in the terrestrial portions of the site; however, data were not available in a final report for assessment in this FYR.			
	Recommendation: Once these data are available in a finalized report, perform an assessment to determine whether the remedy for the terrestrial portion of the site remains protective of human health and the environment.			

Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	Navy	Ecology	December 2030

Protectiveness Statement(s)

Operable Unit: 1	Protectiveness Determination: Not Protective	Addendum Due Date: Not applicable

Protectiveness Statement: The remedy at OU 1 is not protective. Exposure pathways identified in the OU 1 ROD that could result in unacceptable risks are being controlled and monitored via LUCs while further information is being obtained. However, substantial investigation work was conducted during this FYR period focused on updating the CSM and reassessing potential risks to human health and the environment. This work is ongoing, but data and evaluations to date document substantial changes to the CSM and the risk conclusions presented in the OU 1 ROD. The HHRA/ERA addendum that is likely to be finalized shortly after the review period for this FYR is expected to show unacceptable risks not identified in the OU 1 ROD to both human and ecological receptors. Human health risks are primarily driven by exposure to COCs in sediment, surface water and through consumption of shellfish. COCs in sediment and porewater occur at higher concentrations than previously understood and present a potential pathway for unacceptable risk for ecological receptors at OU 1. The ongoing supplemental RI will provide the data to allow evaluation of potential additional removal or remedial action(s) under a FFS that could be taken to address these risks, shorten the overall restoration timeframe, and be protective in the long term.

Operable Unit: 2 (Area 2 and Area 8)	Protectiveness Determination: Not Protective	Addendum Due Date: Not applicable

Protectiveness Statement: Overall, OU 2 is not protective because the remedy at Area 8 is not protective of ecological receptors. The remedy at OU 2 Area 2 is short-term protective. Known exposure pathways that could result in unacceptable risks are being controlled and monitored via LUCs. However, the additional monitoring wells installed during this FYR period show concentrations of TCE several times higher than the highest concentrations documented in the OU 2 ROD, even after 30 years of monitoring. The new wells installed may not be optimally positioned to reliably assess whether migration pathways are known, and exposures controlled. The remedy at OU 2 Area 8 is protective of human health; however, it is not protective of ecological receptors based on a finding of unacceptable risk, for which a contingent remedial action has not yet been implemented as required by the OU 2 ROD. To identify a feasible contingent groundwater control action, the Navy is currently performing a supplemental RI and supporting bench-scale studies and will be initiating a FFS in the near future. Once identified, and agreed upon by regulators and stakeholders, the Navy will document the selected contingent groundwater control action in a ROD amendment. The Navy will then perform remedial design, implement additional remedial action to address elevated COC concentrations in intertidal sediment and on-going discharge of these COCs in seep water. The HHRA at the Area 8 beach intertidal zone concluded that, despite the presence of several COCs in the beach sediment and clam tissue at concentrations exceeding background and reference area concentrations, the incremental site risk over reference area risk for Suquamish subsistence and recreational receptors meets target health goals. The ERA concluded that there was no risk to higher trophic level species, but acute and chronic exposure to accumulated contaminants in sediment pose a current potential hazard to benthic organisms based on the bioassay results/endpoints.

Operable Unit: Sitewide	Protectiveness Determination: Not Protective	Addendum Due Date: Not applicable

Protectiveness Statement: The remedies at NBK Keyport are not protective. Additional post-ROD investigations at OU 1 have identified substantially higher contaminant concentrations distributed more widely both laterally and vertically, and new exposure pathways that are likely to represent unacceptable risks. At OU 2 Area 8 the contingent remedial action has not yet been implemented to address the demonstrated unacceptable ecological risk. OU 2 Area 2 is short-term protective, but the remedy is not functioning as intended by the OU 2 ROD and all potential exposure pathways may not be controlled.

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Acronyms and Abbreviations

AFFF ..... aqueous film forming foam
AFM..... analog flow model
AGI ..... Advanced Geosciences, Inc.
Ai-RS ..... Ai-Remedial Systems
AOPC ..... area of potential concern
ARAR ..... applicable or relevant and appropriate requirement

bgs ..... below ground surface
BOD ..... biological oxygen demand
BSAF ..... building-specific attenuation factor
BTEX.....benzene, toluene, ethylbenzene, and xylenes

CERCLA..... Comprehensive Environmental Response, Compensation, and Liability Act
CFR.....Code of Federal Regulations
CLARC ..... cleanup levels and risk calculation
CO..... commanding officer
COC ..... contaminant of concern
COD .....chemical oxygen demand
COI..... chemical of interest
COPC.....contaminant of potential concern
CRA.....contingent remedial action
Cr(VI)..... hexavalent chromium
CSL .....cleanup screening level
CSM .....conceptual site model
cVOC..... chlorinated volatile organic compound

DCA.....dichloroethane
DCE.....dichloroethene
DF ..... dioxins/furans
DNA..... deoxyribonucleic acid
DO.....dissolved oxygen
DOC .....dissolved organic carbon
DoD ..... Department of Defense
DPT ..... direct push technology
DRO ..... diesel range organics
DU ..... decision unit

EC .....engineering control

Ecology ..... Washington State Department of Ecology
EE/CA ..... engineering evaluation/cost analysis
EPA ..... U.S. Environmental Protection Agency
ERA ..... ecological risk assessment
ERT ..... electrical resistivity tomography
ESD ..... explanation of significant difference
ESS ..... environmental sequence stratigraphy

FFS ..... focused feasibility study
FS ..... feasibility study
ft ..... feet
FYR ..... five-year review

g/day ..... gram per day
GIS ..... geographic information system
gpm ..... gallon per minute

HHRA ..... human health risk assessment
HHRS ..... human health risk screening
HQ ..... hazard quotient
HSU ..... hydrostratigraphic unit
HVAC ..... heating, ventilation, and air conditioning
HVDPE ..... high vacuum dual phase extraction

IC ..... institutional control
IR&D ..... internal research and development
IRIS ..... Integrated Risk Information System
ISM ..... incremental sampling methodology
ITRC ..... Interstate Technology & Regulatory Council

kg ..... kilogram
KIC ..... Keyport Improvement Club

LFG ..... landfill gas
LOD ..... limit of detection
LTM ..... long-term monitoring
LUC ..... land use control

MCL ..... maximum contaminant level
µg/kg ..... microgram per kilogram

µg/L ..... microgram per liter
µg/m^3 ..... microgram per cubic meter
mg/kg ..... milligram per kilogram
mg/L ..... milligram per liter
MIP ..... membrane interface probe
MNA ..... monitored natural attenuation
MTCA ..... Model Toxics Control Act
MW ..... monitoring well

N/A ..... not applicable
Navy ..... U.S. Navy
NAVFAC Northwest ..... Naval Facilities Engineering Command Northwest
NBK ..... Naval Base Kitsap
NCP ..... National Oil and Hazardous Substances Pollution Contingency Plan
NOAA ..... National Oceanic and Atmospheric Administration
NTR ..... National Toxics Rule
NUWC ..... Naval Undersea Warfare Center

O&M ..... operation and maintenance
OM&M ..... operation, maintenance, and monitoring
OC ..... organic carbon
ORP ..... oxidation/reduction potential
OU ..... operable unit

PA ..... preliminary assessment
PAH ..... polycyclic aromatic hydrocarbon
PAL ..... project action limit
PAO ..... Public Affairs Officer
PCB ..... polychlorinated biphenyl
PCE ..... tetrachloroethene
PED ..... polyethylene device
PFAS ..... per- and polyfluoroalkyl substances
PFBS ..... perfluorobutanesulfonic acid
PFOA ..... perfluorooctanoic acid
PFOS ..... perfluorooctanesulfonic acid
pg/L ..... picogram per liter
PQL ..... practical quantitation limit
PRB ..... permeable reactive barrier

RAB ..... Restoration Advisory Board

RAO ..... remedial action objective
redox ..... oxidation reduction
RG ..... remedial goal
RI ..... remedial investigation
ROD ..... Record of Decision
RPM ..... remedial project manager
RSL ..... regional screening level

SAP ..... sampling and analysis plan
SB ..... soil boring
SCO ..... sediment cleanup objective
SCUM ..... Sediment Cleanup User's Manual
SI ..... site investigation
SIM ..... selected ion monitoring
SL ..... screening level
SMS ..... sediment management standards
SQS ..... sediment quality standard
SVOC ..... semi-volatile organic compound

TCA ..... trichloroethane
TCE ..... trichloroethene
TEQ ..... toxicity equivalent
TOC ..... total organic carbon
TPH ..... total petroleum hydrocarbons
TRP ..... time-lapse electrical resistivity tomography
TS ..... total solids

UCL ..... upper confidence limit
USGS ..... U.S. Geological Survey
UST ..... underground storage tank
UE ..... unrestricted exposure
UU ..... unlimited use

VC ..... vinyl chloride
VOC ..... volatile organic compound

WAC ..... Washington Administrative Code
WDOH ..... Washington Department of Health
WQC ..... water quality criteria

1.0 Introduction

This report presents the results of the sixth five-year review (FYR) performed for Operable Units (OUs) 1 and 2 at Naval Base Kitsap (NBK) Keyport. The purpose of a FYR is to determine whether the remedies selected for implementation at sites in the associated Record of Decision (ROD) remain protective of human health and the environment. The data review and technical assessment performed and protectiveness determinations developed during the FYR process are documented in this sixth FYR report, which also identifies issues, if any, found during the FYR process, and provides recommendations to address those issues.

This FYR was prepared pursuant to Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9621(c), and Section 300.430(f)(4)(ii) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. § 300.430(f)(4)(ii). Because hazardous substances, pollutants, or contaminants remain at the OUs above levels that allow for unlimited use and unrestricted exposure (UU/UE) following implementation of the remedial action, a statutory review (i.e., FYR) is required under CERCLA and the NCP. This FYR was initiated in June 2024 and is based on final data reports generated between July 2019 and October 2024. In addition, analytical data from ongoing studies have been summarized. The triggering action for this review is the execution of the fifth FYR (United States [U.S.] Navy, 2020a), which was signed on November 23, 2020. The previous FYRs for NBK Keyport were completed in 2000, 2005, 2010, and 2015 (Navy, 2000a, 2005, 2010, 2015a, and 2020a).

This FYR report was prepared as part of the CERCLA FYR process using Navy and U.S Environmental Protection Agency (EPA) guidance (Navy, 2004, 2011, 2013, 2014a; EPA, 2001, 2012, and 2016), documenting the results of the review, identified issues, and recommended actions. This FYR report is organized in accordance with EPA's 2016 recommended template and has been streamlined to minimize information that has been presented in the previous five (5) FYRs. The intent is to focus on activities and issues over the last five (5) years, current protectiveness, and recommendations for the next five (5) years.

NBK Keyport is bordered by Liberty Bay on the north and northwest and Port Orchard Inlet on the northeast and east and is adjacent to the town of Keyport (see Figure 1-1). Several areas and sites at NBK Keyport have been impacted by historical activities, including releases to the environment. Hazardous substances, pollutants, or contaminants remain above levels that allow for UU/UE. The areas and sites comprising OU 1 and OU 2 sites at NBK Keyport include the following:

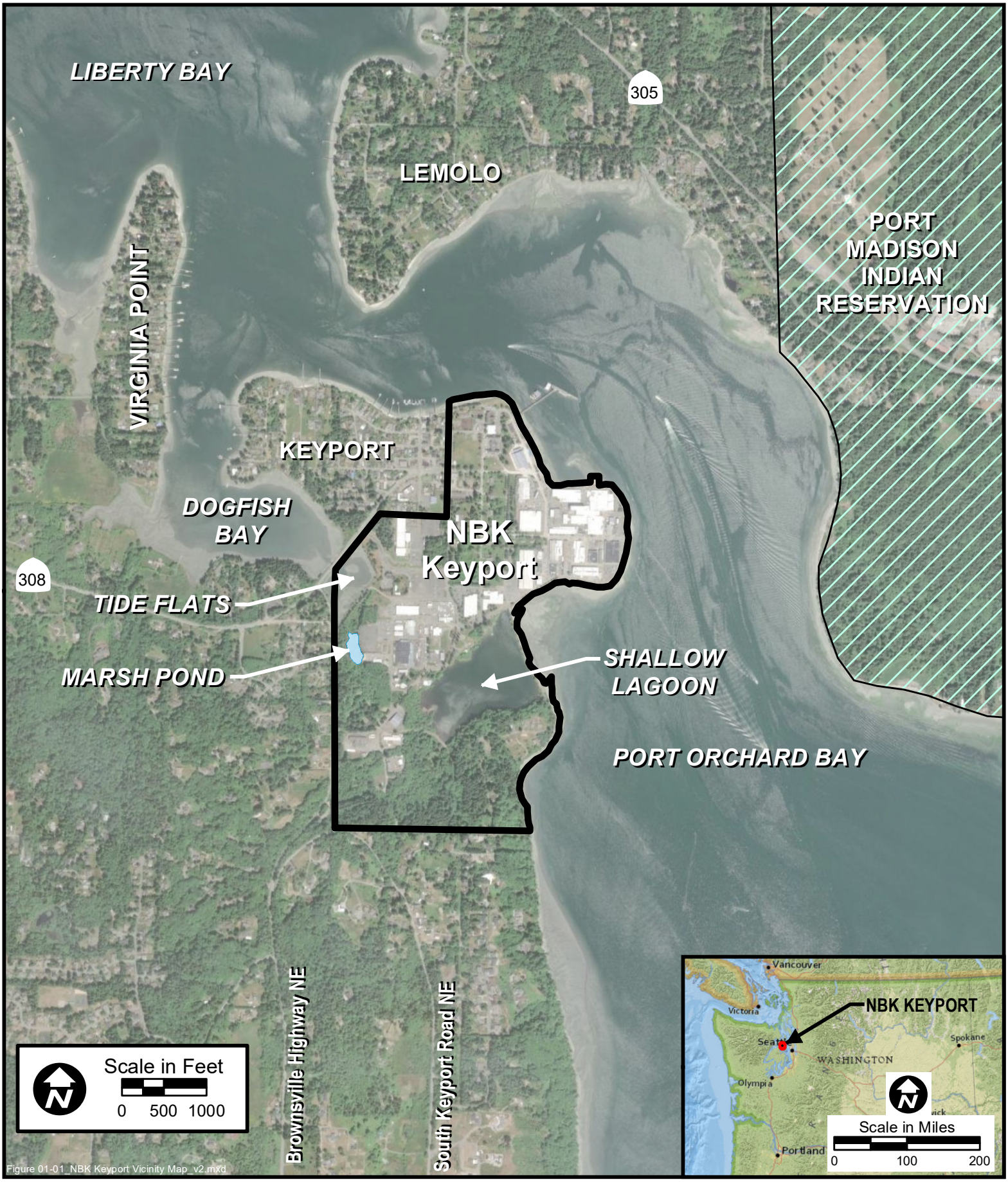
- OU 1:
    - Area 1 – Former Landfill
- OU 2:
    - Area 2 – Van Meter Road Spill/Drum Storage Area
    - Area 3 – Otto Fuel Leak Area (no further action; not subject to FYR)
    - Area 5 – Sludge Disposal Area (no further action; not subject to FYR)
    - Area 8 – Plating Shop Waste/Oil Spill Area
    - Area 9 – Liberty Bay (no further action; not subject to FYR)

This FYR report covers the remedies selected in the RODs for OU 1 and OU 2 (Navy, EPA, Ecology, 1998 and 1994, respectively). The OU 1 ROD specifies that the site "was also called Area 1 and is currently designated Operable Unit (OU) 1", so is referred to as OU 1 from here forward. The OU 2 ROD specifies that only Area 2 and Area 8 are subject to the FYR; no further action or FYR is required for Area 3; and only confirmation sampling was required at Areas 5 and 9. Because confirmation sampling (Navy, 1996a and 1996b) at both Areas 5 and 9 indicated contamination did not exceed any associated remedial goals (RGs), no further action was needed at Areas 5 and 9. Therefore, Areas 3, 5, and 9 meet UU/UE levels and, as such, are not subject to FYRs. OU 2 Areas 3, 5, and 9 are not carried further in this FYR and were not included in previous FYRs (Navy, 2000a, 2005, 2010, 2015a, 2020a).

In addition to OU 1 and OU 2, the land use control (LUC)-only sites 7, 22, and 23 are briefly included in this FYR report for completeness. One of these LUC-only sites was included in previous FYRs: Site 23. An engineering evaluation/cost analysis (EE/CA) and removal action were performed at Site 23, and LUCs were implemented following the removal action to be conservative (Navy, 2000b).

Areas 7 and 22 were evaluated during a Site Investigation (SI; Navy, 1993b), which recommended that these sites not be further investigated under the Remedial Investigation (RI); however, the Navy chose to implement institutional controls (ICs) at these areas to be conservative.

The areas that comprise OU 1 and OU 2 are shown on Figure 1-2. OU 1, OU 2 Area 2, and OU 2 Area 8 are shown on Figures 1-3 through 1-5, respectively. Figure 1-6 depicts the chronology of events at OU 1, OU 2, and sitewide. Table 1-1 summarizes the history of contamination, physical characteristics, primary threat, land and resource use, and removal actions performed at each of these sites. A more in-depth description of each site is available in the fourth FYR (Navy, 2015a).



U.S. NAVY	Figure 1-1 NBK Keyport Vicinity Map	NBK KEYPORT SIXTH FIVE-YEAR REVIEW

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Explanation

- Areas Included as Part of the Five-Year Review
- Areas Not Included as Part of the Five-Year Review

DATE: 2/26/2025 ANALYST: chiquesl

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U.S. NAVY	Figure 1-2 Locations of OU 1, OU 2, and Institutional Control Only Sites	NBK KEYPORT SIXTH FIVE-YEAR REVIEW

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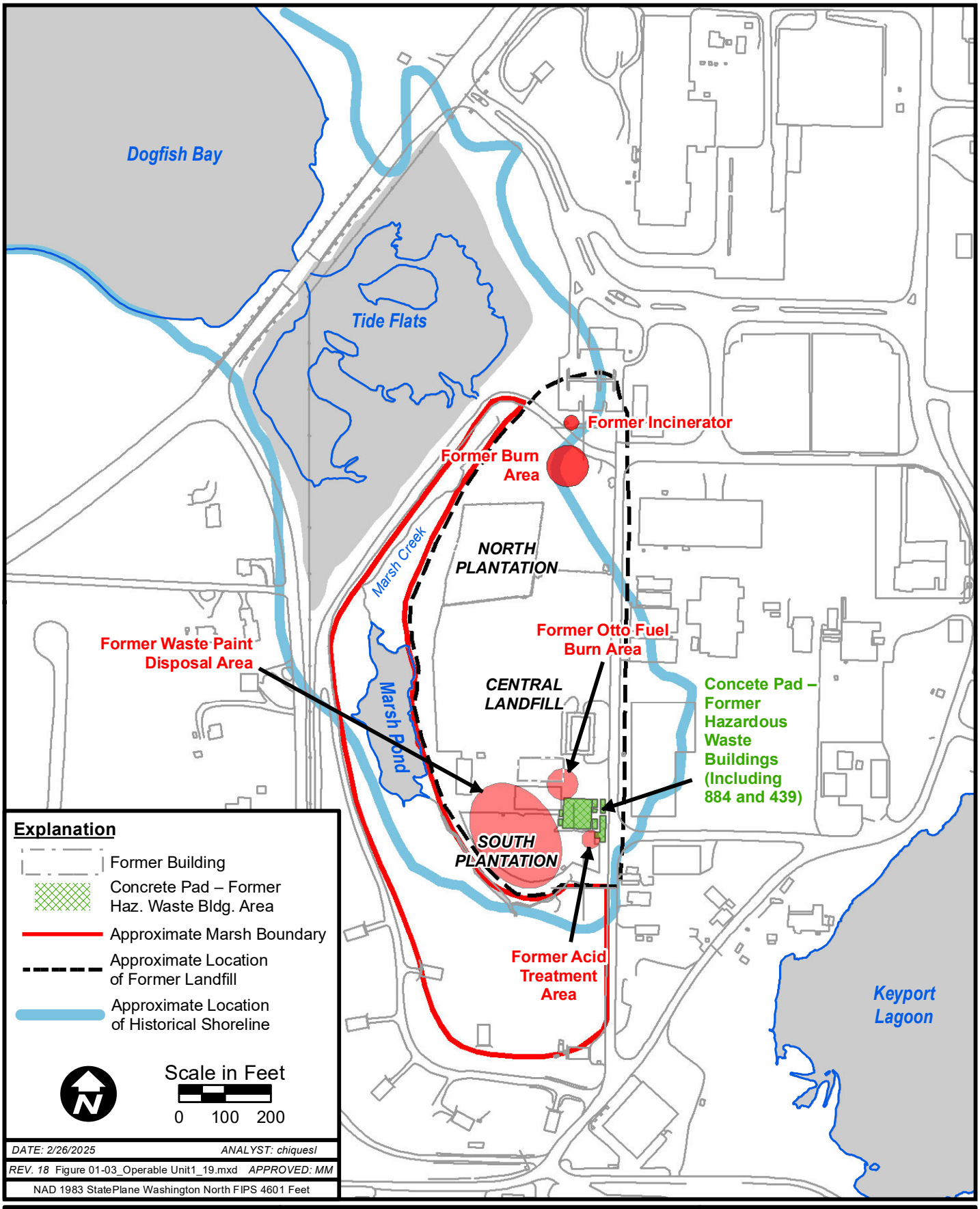

U.S. NAVY	Figure 1-3 OU 1 Site Map	NBK KEYPORT SIXTH FIVE-YEAR REVIEW

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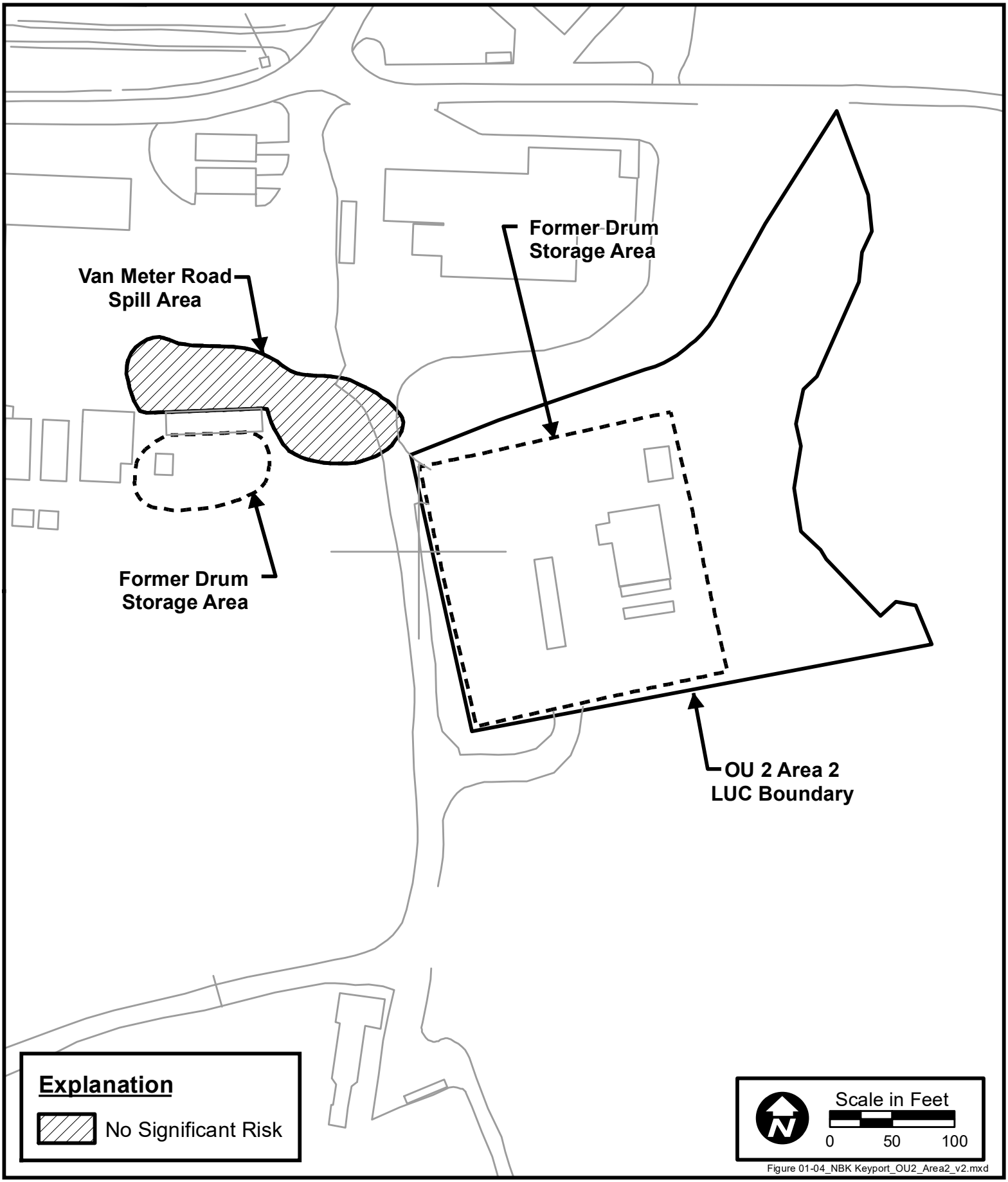

U.S. NAVY	Figure 1-4 OU 2 Area 2 Site Map	NBK KEYPORT SIXTH FIVE-YEAR REVIEW

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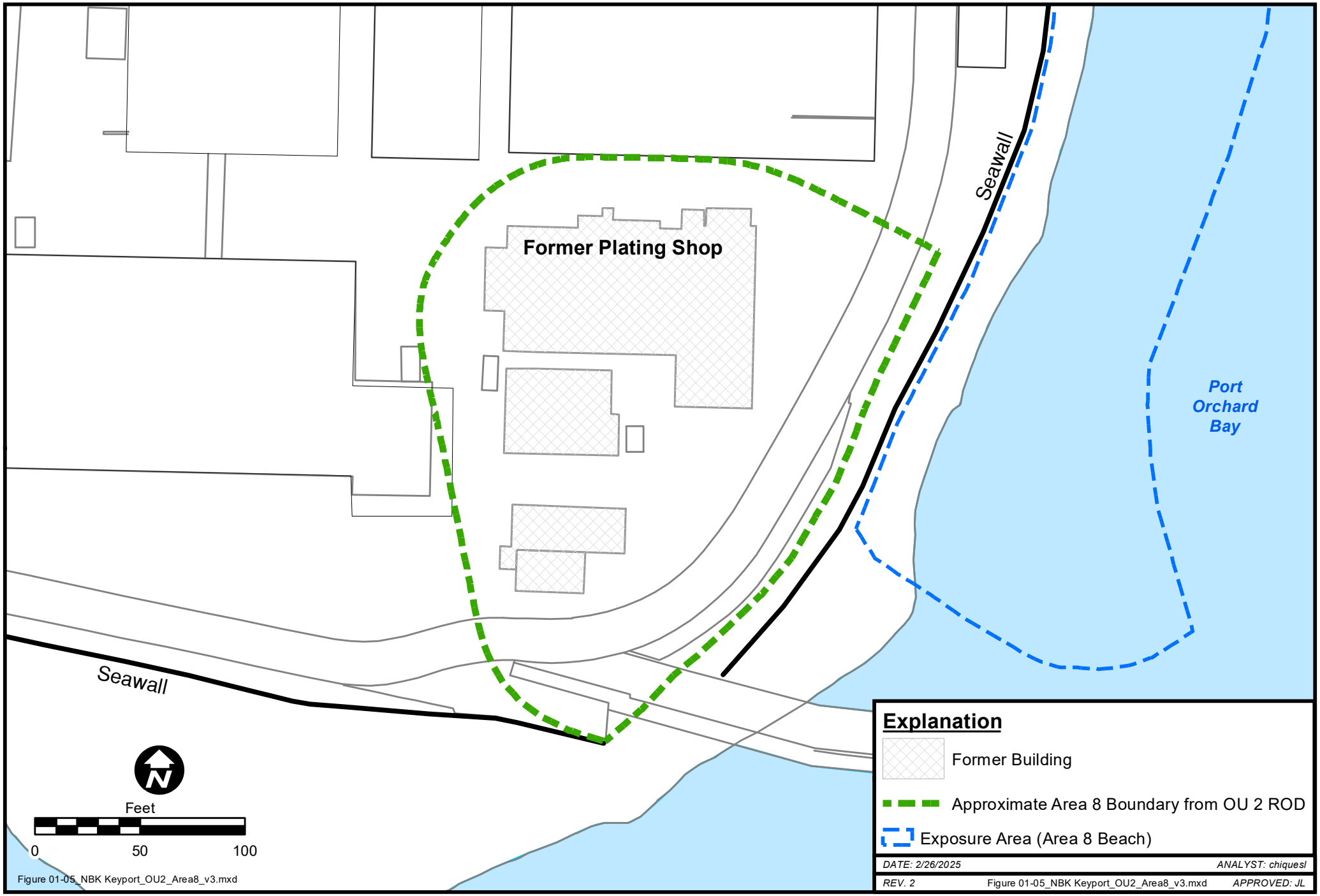

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Figure 1-5
OU 2 Area 8 Site Map

NBK KEYPORT
SIXTH
FIVE-YEAR REVIEW

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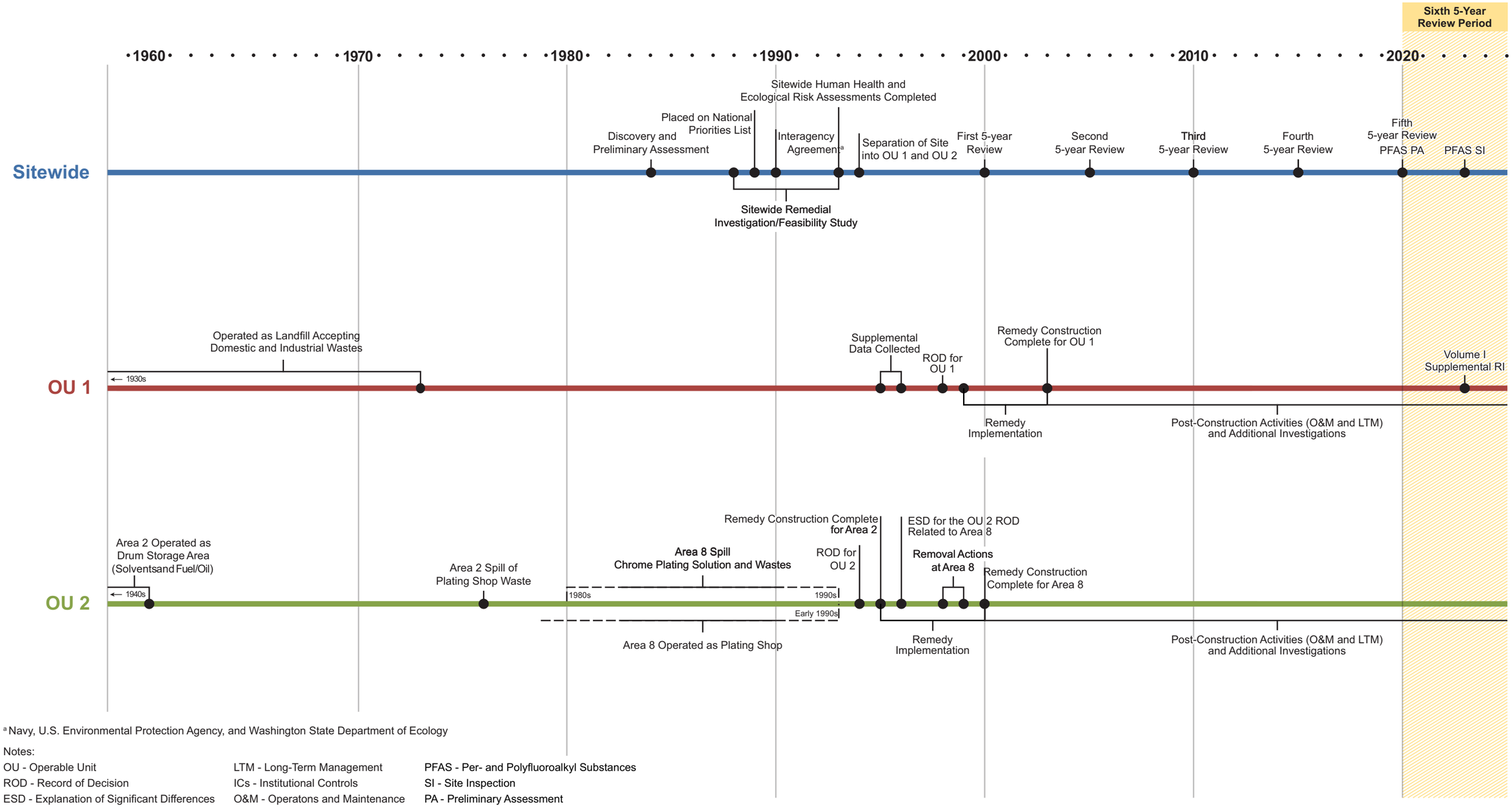

[a] Navy, U.S. Environmental Protection Agency, and Washington State Department of Ecology

Notes:

OU - Operable Unit
ROD - Record of Decision
ESD - Explanation of Significant Differences
LTM - Long-Term Management
ICs - Institutional Controls
O&M - Operatons and Maintenance
PFAS - Per- and Polyfluoroalkyl Substances
SI - Site Inspection
PA - Preliminary Assessment

FIGURE 01-06_CHRONOLOGY_KEYPORT_6TH FYR_v1.CDR

U.S. NAVY	**Figure 1-6** **Chronology of Events at OU 1 and OU 2**	NBK KEYPORT SIXTH FIVE-YEAR REVIEW

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Table 1-1. Background Information Summary

Site/Area	History of Contamination	Physical Characteristics	Primary Threat	Land and Resource Use	Removal Actions Performed
Operable Unit 1					
Former Landfill	1930s until 1972 – Primary base landfill. Disposal area for domestic and industrial wastes generated by the base until closed. 1930s to the 1960s – Burn pile for trash and demolition debris located at the north end of the landfill. Unburned or partially burned materials from this pile were buried in the landfill or pushed into the marsh. 1930s to the 1960s – Trash incinerator was operated at the north end of the landfill and incinerator ash was disposed of in the landfill.	Covers approximately 9 acres of the western part of the base. Is unlined, and covered with areas of grass, trees, concrete, and asphalt. Placed in the eastern portion of a marsh and stream complex, remnants of which remain to the west, flowing through tide flats and into Dogfish Bay. Groundwater is present in a shallow unconfined aquifer with a water table at 4 to 8 feet below ground surface (bgs). Shallow groundwater in this aquifer flows west towards the adjacent surface water with a deeper component of flow to the northwest.	Chlorinated aliphatic hydrocarbons pose a risk to human health from drinking water and shellfish ingestion pathways, and vapor intrusion at the landfill surface. Polychlorinated biphenyls (PCBs) pose a risk to human health from bioaccumulation, potentially impacting the shellfish ingestion pathway.	Occupied buildings for office space and industrial uses are adjacent to the former landfill east of Bradley Road. Two phytoremediation plantations occupy the majority of the northern and southern portions of the landfill. The central portion of the landfill is paved and currently used regularly for motorcycle training and as a parking lot.	Removal of PCB-contaminated sediments from marsh to prevent PCBs from potentially migrating to the tide flats and Dogfish Bay.
Operable Unit 2					
Area 2 – Van Meter Road Spill/Drum Storage Area	Comprises three (3) areas: Building 734 former drum storage area, Building 957 former drum storage area and Van Meter Road spill area. 1940s through the 1960s – Drum storage areas were active and reportedly stored all chemicals used at the base (including solvents and fuel/oil). An estimated 4,000 to 8,000 gallons of these chemicals were discharged to the two (2) unpaved areas as a result of spills and leaks. 1976 – Approximately 2,000 to 5,000 gallons of plating shop wastes spilled from a tanker truck on the pavement near Van Meter Road, impacting a nearby stream.	Located in the southwest corner of the base and bounded to the north and east by Westfall Road, to the west by Keys Road, and to the south by a sharp topographical rise. Van Meter Road bisects the area in a north-south direction. Groundwater is present at a depth of approximately 4 to 8 ft bgs. Shallow groundwater near Area 2 flows northeasterly and discharges into a shallow lagoon.	Trichloroethene (TCE) and vinyl chloride (VC) were identified as chemicals of concern (COCs) in the drum storage areas during the Remedial Investigation/Feasibility Study (RI/FS) based on the risk analysis. No significant risk was identified at the Van Meter Road plating shop waste spill. No significant risk to terrestrial or aquatic organisms was identified at any of the three (3) areas at Area 2.	Area 2 is currently used for inert materials storage and intermittently for industrial purposes.	None.
Area 8 – Plating Shop Waste/Oil Spill Area	Past releases include spillage of chrome plating solution containing volatile organic compounds (VOCs) onto the ground; discharge of plating wastes into a utility trench; and leakage of plating solutions through cracks in the plating shop floor, waste disposal pipes, and sumps during plating shop operation. Petroleum hydrocarbons (i.e., diesel and heavy oil) were also released to the environment from leaking underground storage tanks (USTs) and underground concrete vaults located within Area 8.	Occupies 1 acre on the eastern portion of the base and surrounds the location of the former plating shop (Building 72). Groundwater is present at a depth of approximately 10 ft bgs. Shallow groundwater from the site discharges into Port Orchard Bay.	VOCs and metals (i.e., arsenic, cadmium, and chromium) were identified as COCs in groundwater based on residential use of groundwater as drinking water and inhalation during household use. Arsenic concentrations were suspected to be related to background concentrations; and therefore, dropped as a COC. VOCs, semi-volatile organic compounds (SVOCs), and total petroleum hydrocarbons (TPH) diesel were identified in 1998 and 1999 near the former fuel storage vaults.	Area 8 is in a heavily industrialized part of the facility bordered by Port Orchard Bay to the south and east. The area is used for parking and has occupied buildings for office space and industrial uses.	Removal and disposal of “hot-spot” metals-contaminated soil. Removal of TPH-contaminated soil, conducted under the Underground Storage Tank (UST) Program as an independent action in accordance with Model Toxics Control Act (MTCA) regulations.

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2.0 Response Action Summary

This section summarizes remedy implementation; actions subsequent to remedy implementation; and operations, maintenance, and monitoring (OM&M) at OU 1 and OU 2. A more detailed narrative description of the response actions at NBK Keyport is available in Section 4 of the third FYR (Navy, 2010). Table 2-1 provides a remedial action summary, including reasonably anticipated land use, contaminants of concern (COCs) requiring action, media, cleanup levels, remedial action objectives (RAOs), remedy components, remedy construction complete, and site closeout strategy for OU 1 and OU 2 sites.

At OUs 1 and 2, the remedies include LUCs. The terminology LUCs includes both ICs and engineering controls (ECs). Historically at NBK Keyport, the term IC has been used to identify all LUCs, and this is not consistent with the current standard usage of these terms (Navy, 2001). For consistency with Navy guidance (Navy, 2001), this FYR uses the term “LUC” rather than “IC” to discuss both the ICs and ECs associated with each site.

2.1 Operable Unit 1

This section presents the remedy construction, investigations, and OM&M for OU 1 conducted during this FYR period (see Figures 1-2 and 1-3 for an overall plan view of the site, with sampling locations provided on figures in Section 4). Remedies identified in the OU 1 ROD have been implemented; construction is complete for all elements; OM&M activities are ongoing; and LUCs are in place. Post-ROD investigations were conducted during this FYR period and are described in Section 2.1.2.

2.1.1 OU 1 Remedy Construction

Per the OU 1 ROD (Navy, EPA, Ecology, 1998), the remedy included the following components, which have been completed:

- April 1999 – Planted two (2) phytoremediation plantations of hybrid poplar trees, referred to as the “north” and “south” plantations, designed to work in concert with monitored natural attenuation (MNA) to remove and treat volatile organic compound (VOC)-contaminated groundwater and reduce the long-term potential for VOC migration from the site.
- November 1999 – Upgraded the tide gate to improve the control of tidal flow between the tide flats and the marsh, thereby ensuring that the landfill is protected from tidal inundation that could erode its banks or adversely affect contaminant mobilization (Navy, 1999).

- 1999 – Installed three (3) wells (MW1-41 and two [2] irrigation wells), 10 piezometers, and two (2) lysimeters to monitor groundwater concentrations and water levels.
- 1999 – Removed polychlorinated biphenyl (PCB)-contaminated sediment from a small area of the marsh near the tide flat to prevent PCB-contaminated sediment from potentially migrating to the tide flats and Dogfish Bay (Navy, 1999).
- March 2003 – Prepared a contingent remedial action (CRA) plan, specifying the conditions under which the Navy will implement additional remedial actions if the identification of significant contaminant concentrations are found to be migrating from OU 1 to water supply wells in the area (Navy, 2003). Consistent with CERCLA, the CRAs were evaluated against NCP criteria with awareness of the public involvement requirements of CERCLA. The February 2012 revision of the CRA Plan (Navy, 2012i) addressed recommendations from the third FYR regarding the addition of 1,4-dioxane to the CRA Plan.
- January 2005 – Upgraded the asphalt landfill cover to prevent exposure from contact with soil and debris.

2.1.2 OU 1 Post-Remedy Construction Investigations

During this FYR period, additional investigations were conducted to address recommendations from the fifth FYR (Navy, 2020a). The activities associated with and objectives of these investigations are presented below. The data review and evaluation results are provided in Section 4.2.

2021 PCBs in Sediment Investigation (Navy, 2022b): Sediment sampling in the reach of Marsh Creek from seep SP1-1 to the tide gate was conducted utilizing incremental sampling methodology (ISM) techniques, with the reach of Marsh Creek divided into three (3) decision units (DUs).

2021 Landfill Gas Mitigation Design (Navy, 2022c): This study included a landfill gas (LFG) generation and migration potential evaluation, review of historical methane gas detection, summary of recent methane monitoring results, regulatory background and permitting, LFG mitigation design, and a LFG monitoring program for OU 1 (Area 1 landfill).

2021 Upland Shallow Soil Data Summary and Evaluation (Navy, 2023h): This summary and analysis of chemicals of interest (COIs) in upland shallow soil within risk assessment Exposure Area 2 at OU 1 supports the supplemental RI in progress for the site. Shallow soil sampling was conducted in June 2021 throughout Exposure Area 2 (see Section 4.2.1 for additional explanation of the exposure areas being investigated,

with the exposure areas shown on Figure 4-18) and specifically in the vicinity of the former incinerator and burn area located in the northern portion of the landfill (Figure 1-3). Soil excavated from elsewhere at NBK Keyport was stockpiled, at an unknown time prior to 1998, on top of the waste body in the center of Exposure Area 2. Discrete soil samples from this exposure area were analyzed for a comprehensive list of analytes to assess the presence or absence of COIs in support of risk assessment planning.

2021 Human Health and Ecological Risk Assessment Field Investigation (Navy, 2024a): This field investigation included soil, sediment, surface water, and tissue sampling conducted in June, July, August, and October 2021 at OU 1. The data generated were used to support evaluation of risk to human health and the environment that will be included in a separate human health risk assessment (HHRA) and ecological risk assessment (ERA) addendum presented as Volume 2 of the supplemental RI.

2022 High Vacuum Dual Phase Extraction (HVDPE) Pilot Study (Navy, 2023b): A pilot study was conducted between April and July 2022 to collect the data necessary to assess the effectiveness of HVDPE as a potential remedial technology to treat hot spots at OU 1.

2022-2023 Supplemental RI, Volume 1 (Navy, 2023a): Within Volume 1 of the supplemental RI is a synthesis and interpretation of the results of investigations performed between 2014 and 2022 at OU 1. This report supplements the RI for OU 1 finalized in 1993 (Navy, 1993a). The overall objective of these post-ROD investigations was to refine the conceptual site model (CSM) in support of potential remedy optimization to reduce the restoration timeframe. Additional elements of the supplemental RI are being conducted under a separate contract including the HHRA/ERA addendum (Volume 2 of the supplemental RI) and an investigation of potential off-site transport of contaminants in groundwater beneath Dogfish Bay (Volume 3 of the supplemental RI).

2022-2023 Supplemental Sampling (Navy, 2024b): From 2022 to 2023, various sampling events were conducted to support ongoing supplemental RI activities at OU 1. These sampling events include: 1) groundwater, porewater, and surface water sampling to support the HVDPE Pilot Study; 2) groundwater sampling at wells located near the Highway 308 causeway; and 3) sediment sampling near Marsh Creek for PCB congeners using ISM.

2024 Interim Long-Term Monitoring Sampling (Navy, 2024l): Additional interim supplemental sampling was conducted at OU 1 in 2024. The data for this sampling event were not published as final within this FYR reporting period, but this interim sampling scope consisted of:

- Groundwater sampling and analysis for chlorinated volatile organic compounds (cVOCs), PCBs as Aroclors, diesel range organics (DRO), 1,4-dioxane, and MNA parameters at 21 selected monitoring wells.
- Seep sampling and analysis for cVOCs and PCBs as Aroclors.

2.1.3 OU 1 Operations, Maintenance, and Monitoring

Operation and Maintenance. Since the fifth FYR (Navy, 2020a), the Navy has continued operation and maintenance (O&M) of the OU 1 remedy. The O&M at OU 1 consists of the following:

- Phytoremediation tree health maintenance
- Tide gate inspection and maintenance

Phytoremediation O&M activities have been conducted since the trees were planted in 1999. The primary objective is to establish and maintain mature, healthy stands of trees to maximize contaminant uptake by the trees. Inspections occurred eight (8) times per year during this FYR period, on a monthly or quarterly basis depending on the season. The plantations are inspected/monitored for overall condition, including general physical health, insect damage, water stress, nutrient deficiency, and disease symptoms. Regular maintenance actions include weeding, thinning, pruning, and identifying and reporting any pests found on a regular basis and applying fertilizer as directed by the Navy. Additional maintenance activities/corrective actions occur as necessary, such as treating infestations with pesticide and/or herbicide applications to maintain healthy stands of trees. During this FYR period, only minor pruning and weed control maintenance activities occurred (Navy, 2021a, 2023e, 2023f, 2024d).

Tide gate inspection and maintenance occurs four times per year and has been performed since the tide gate was upgraded in 1999 and replaced in 2023. The primary objective is to ensure that the tide gate is working as intended and designed to limit tidal flooding of the marsh, which could cause erosion of the landfill and/or adversely affect planation tree health. Routine tide gate maintenance, cleaning, and testing are conducted during each inspection and include removing any biofouling, sediment, or debris lodged or accumulated on any parts of the tide gate or upper culvert grate.

All inspection and maintenance activities since the last FYR were generally performed in accordance with the Quality Control Plan (Navy, 2014b) and the revised O&M Plan (Navy, 2017c, 2021b, 2024h). This O&M Plan applies to long-term O&M of the phytoremediation plantations and tide gate system at OU 1. The inspection and maintenance schedule was updated in 2021 based on recommendations from the 2019

annual O&M report (Navy, 2019d), 2019 groundwater monitoring report (Navy, 2020g), and the fourth FYR (Navy, 2015a). The 2024 update of the O&M Plan was a result of the installation of a new tide gate in August 2023.

Monitoring. As part of the remedy, a long-term monitoring (LTM) program was initiated in 1999, including phytoremediation monitoring, risk and compliance monitoring, and intrinsic bioremediation monitoring. LTM at Keyport OU 1 did not occur during this FYR period with the concurrence of the EPA and Washington State Department of Ecology (Ecology) Project Managers, given the substantial changes in the CSM and the ongoing investigations. However, the LTM contractor was used to perform various sampling efforts throughout the FYR period to support further site characterization. Although the traditional LTM program has been paused, the other monitoring conducted during this period has met the intent of the ROD-required monitoring.

Long-Term Monitoring

The LTM program at OU 1 has historically involved periodic sampling of groundwater, seep water, marine sediment, and marine tissue (clam). It has also involved periodic water level measurements in wells set in the upper and intermediate portions of the aquifer to monitor the groundwater flow direction. The overall objective of the LTM program was to monitor trends in COC concentrations and evaluate whether the selected remedy meets the RAOs.

As discussed in the preamble to this monitoring section under **Monitoring**, LTM was paused in 2018, with more focused monitoring events performed in support of the site recharacterization. LTM will be resumed once the LTM plan has been revised in collaboration with the EPA, Ecology, and Suquamish Tribe (i.e., the Keyport Project Team). The data collected during this FYR period are presented in Section 4.2.

All OU 1 monitoring activities since the last FYR were performed in accordance with the regulator-approved monitoring sampling and analysis plans (SAPs; Navy, 2017b, 2021d, 2024l) as amended by written approval and are based on regulator-approved recommendations in the fourth and fifth FYRs. When LTM resumes, the ROD-specified sampling frequencies will be taken into account as part of LTM sampling and analysis plan (SAP) preparation.

Phytoremediation Monitoring

Monitoring activities focused on assessing the performance of phytoremediation were performed since implementation of the phytoremediation remedy through spring 2017 and included the following:

- Periodic groundwater elevation measurements in monitoring wells and piezometers set in the upper portion of the aquifer in and around the plantations;

- Periodic groundwater sampling and chemical analysis from wells primarily in and around the plantations; and
- Periodic surface water and seep water sampling and chemical analysis from stations in the vicinity of the plantations.

These monitoring activities were suspended in 2018 along with LTM activities.

Contingent Remedial Action Monitoring

The CRA monitoring program was implemented in conjunction with the risk and compliance and phytoremediation monitoring programs and was suspended in 2018 along with LTM activities. CRA monitoring historically included sampling monitoring wells downgradient of the landfill to monitor for migration of contamination toward off-base domestic wells (Navy, 2012c). No evidence of such migration was identified during this monitoring effort.

Intrinsic Bioremediation Monitoring

An additional element of the post-remedy implementation monitoring program was intrinsic bioremediation monitoring. The purpose of this monitoring was to periodically:

1. Ensure that intrinsic biodegradation conditions at the ROD-defined landfill source zones (North and South Plantations) remained favorable for degradation of cVOCs; and
2. Assess whether phytoremediation adversely affects conditions favorable to intrinsic biodegradation.

As described in the summary data assessment report (Navy, 1997b) and OU 1 ROD (Navy, EPA, and Ecology, 1998), groundwater oxidation reduction (redox) conditions at the site were considered to be generally favorable for complete degradation of cVOCs into their innocuous byproducts—carbon dioxide, water, and chloride. Because phytoremediation activities were thought to have the potential to affect redox conditions at the site, the OU 1 ROD specified that performance monitoring should include the redox conditions beneath the plantations to check for potential adverse effects from phytoremediation. The OU 1 ROD also allowed for an evaluation of natural attenuation processes in the event that the phytoremediation component of the remedy was discontinued.

In 1995, the Navy began a cooperative effort with the United States Geological Survey (USGS) to investigate various natural attenuation mechanisms at OU 1 (USGS, 2003). The USGS monitored cVOC concentrations and geochemical conditions in groundwater and surface water on an annual basis from 2001 through 2015 to verify that conditions

remain favorable for biodegradation (USGS, 2015). The USGS monitoring program was discontinued after the 2015 sampling event because the Navy concluded that the monitoring program had met its original objectives.

Using the USGS data and LTM data, the Navy evaluated natural attenuation effectiveness at the site in 2012 (Navy, 2012a). The Navy subsequently performed additional biodegradation studies as part of the supplemental RI (Navy, 2023a), as discussed further in Section 4.2.1.

Land Use Controls. As part of the remedy, LUCs were initiated in 2000 to prevent undue exposure to landfill contaminants in the future. These LUCs included tide gate inspections, preventing the installation of drinking water wells, preventing interference with remedial activities, and preventing development or activity that would disrupt the natural attenuation processes or disturb the landfill, tide flat, or adjoining marsh and shoreline in a manner that could lead to human exposure. These LUCs have been maintained through a Navy permit process which requires all proposed construction activity to be reviewed and approved by the Navy Environmental Remedial Project Manager (RPM), who assesses proposals against the IC Plan requirements (Navy, 2020d).

The updated IC Plan (Navy, 2020d) describes in detail the current land use and users, objectives of the LUCs, and implementation of the LUCs for OU 1. During this FYR period, annual LUC inspections were conducted to document that LUCs are being maintained and have met the following expectations stated in the OU 1 ROD:

- No new water wells have been installed, except for monitoring wells or wells that may be needed for future remedial actions.
- Access controls have been maintained and have prevented access.
- Current land use remains unchanged, and if changes are made, the change will be reviewed and approved in collaboration with Ecology and the EPA.
- The asphalt landfill cover surface is present and documented to: 1) not require major repairs, or 2) repairs are recommended.
- No new drinking water wells have been installed on Navy property or within 1,000 feet of the landfill.
- Administrative procedures are in place to control digging at the landfill and have been followed.

The objectives of the LUCs for areas within OU 1 identified on Figure 2-1 are as follows:

- **Area A** – Land use restrictions that prevent construction of water wells, except for monitoring wells or wells that may be needed for future remedial actions. This area is downgradient of the landfill.
- **Area B** – Land use restrictions that prevent construction of water wells, except for monitoring wells or wells that may be needed for future remedial actions. This area is, or may be, downgradient of the landfill.
- **Area C** – Land use restrictions that address procedures for controlling construction or maintenance activities to prevent activities that would interfere with or compromise the monitoring or other remedial actions for the site. The Navy will be able to conduct construction or maintenance activities. Prior approval of Ecology and EPA will be required for construction or maintenance activities that could affect the monitoring or remedy.
- **Area D** – Land use restrictions and requirements that address maintenance of the landfill cover (including the asphalt cover) and procedures for controlling activities that involve digging or construction at the landfill that could cause exposures to contaminants in soil, groundwater, or vapor within or from the landfill (see 2020 IC Plan for full description).
- **Area E** – Land use restrictions that address procedures for controlling construction or maintenance activities that would (1) disturb the wetlands adjacent to the landfill and could cause exposures to contaminants from the landfill that may be present in the sediments or surface water, or (2) interfere with or compromise the monitoring or other remedial actions for the site. The Navy will be able to conduct necessary construction or maintenance activities subject to (1) taking measures to protect workers and prevent short-term and long-term risks from landfill contaminants and (2) complying with requirements of pertinent wetlands regulations.
- **All Areas** – NBK Keyport will remain a secure facility, limiting access to individuals with bona fide business with the Navy, or invitees. Should the United States decide to cease using the property for military operations (but continue to manage it), the need for and appropriate degree of fencing and securing measures will be reviewed and reestablished at such time by the Navy, with concurrence by Ecology and EPA.

The results of the annual LUC inspections are presented in Section 4.3.

2.2 Operable Unit 2

This section describes the remedy construction; investigations subsequent to remedy

construction conducted during this FYR period; and OM&M for OU 2 Areas 2 and 8 (see Figures 1-2, 1-4, and 1-5). The remedy for OU 2 has been implemented, construction is complete for all elements, OM&M activities are ongoing, and LUCs are in place.

2.2.1 OU 2 Remedy Construction

Per the OU 2 ROD (Navy, EPA, and Ecology, 1994), the remedy includes the following components:

Area 2:

- Install additional upgradient wells to confirm no upgradient source of COCs exists.
- Perform monitoring of natural attenuation parameters.
- Implement LUCs to protect human health.

Area 8:

- July 1998 and March 1999 – Building 72 demolition and hot-spot soil removal based on cadmium and chromium concentrations exceeding Model Toxics Control Act (MTCA) Method B cleanup levels for soil ingestion.
- Perform monitoring of natural attenuation parameters.
- Implement LUCs to protect human health.
- Assess human health and ecological risks based on tissue and sediment data.
- Perform a risk assessment, if warranted.
- Implement contingent groundwater control actions if Area 8 groundwater discharge to the adjacent beach is demonstrated to represent a risk to human health or the environment.

In addition to the remedy components listed above, VOCs, semi-volatile organic compound (SVOCs), and total petroleum hydrocarbons (TPH) as diesel in soil were characterized in 1998 and 1999 at OU 2 Area 8. The monitoring for the independent remedial actions under MTCA for diesel contamination has been completed, as detailed in the fourth FYR (Navy, 2015a). An Explanation of Significant Differences (ESD) was issued for OU 2 Area 8 in 1996 (Navy, EPA, and Ecology, 1996), after initial monitoring requiring chromium speciation indicated that total chromium concentrations could be assumed to be 100 percent hexavalent chromium. Therefore, chromium speciation was discontinued based on the ESD.

2.2.2 OU 2 Post-Remedy Construction Investigations

During this FYR period, additional investigations were conducted at OU 2 Area 2 and OU 2 Area 8 to address recommendations from the fifth FYR (Navy, 2020a). The activities associated with, and objectives of these investigations are described below. The data review and evaluation results are presented in Section 4.2.

An additional investigation conducted at OU 2 Area 2 during this FYR period included:

- Soil and groundwater supplemental investigation

In addition, LTM sampling occurred in 2023 and 2024. The activities associated with, and objectives of these Area 2 sampling events are described below. The data review/results are presented in Section 4.2.

Area 2 Soil and Groundwater Supplemental Investigation. A soil and groundwater supplemental investigation report was completed in April 2023 (Navy, 2023g) to assess whether cVOCs in soil and groundwater extend beyond the existing monitoring well network and to establish current site conditions. Eleven soil borings were drilled, and 11 groundwater monitoring wells were installed in the borings at the locations shown on Figure 2-2. Borings were advanced to total depths between 20 and 40 feet and between three (3) and five (5) samples were collected from each boring for a total of 51 soil samples.

Area 2 Long-Term Monitoring Sampling. An LTM report was completed in March 2024 (Navy, 2024e) to report the results of the Spring 2023 sampling. The purpose was to re-sample new monitoring wells that were installed in 2022 to determine whether cVOCs in groundwater extend beyond the existing LTM well network and to establish current site conditions. Samples were collected from three (3) previously existing wells and the 11 new wells installed in 2022. Based on the results of this sampling event and the April 2023 soil and groundwater supplemental investigation (Navy, 2023g), additional sampling was conducted at Area 2 in 2024. The data for this sampling event were not finalized within this FYR reporting period, but the Area 2 sampling scope consisted of (Navy, 2024j):

- Groundwater sampling for cVOCs and MNA parameters
- Sediment and surface water sampling for cVOCs

Additional investigations conducted during this FYR period at OU 2 Area 8 include:

- 2023 and 2024 vapor intrusion sampling,
- Bench-scale study,

- 2024 seep sampling, and
- Supplemental RI.

The activities associated with, and objectives of these Area 8 investigations are presented below. The data review/results are presented in Section 4.2.

Vapor Intrusion Sampling (Navy, 2024g). Vapor intrusion sampling activities were conducted in August 2023 and January 2024 (two sampling events) at buildings north and west of the former plating shop comprising OU 2 Area 8. The overall objectives of the vapor intrusion sampling were to perform paired sub-slab vapor and indoor air monitoring as recommended for Buildings 82 and 98 to evaluate whether the vapor intrusion pathway has become complete in these two (2) buildings since the 2018 vapor intrusion study (Navy, 2019a) and, if so, whether the completed pathway has the potential to pose a risk to human health.

While the vapor intrusion pathway is not currently a complete exposure pathway, additional inspections and sampling were recommended in the 2018 vapor intrusion study report to ensure no future risks go undetected. Paired sub-slab vapor and indoor air monitoring every five (5) years were recommended for Buildings 82 and 98 (Navy, 2019a). Trichloroethene (TCE) concentrations exceeded sub-slab project action limits (PALs), even after applying building-specific attenuation factors (BSAFs), and are more than half the indoor air PALs for these buildings, so there is a potential for indoor air vapor intrusion. It was recommended that sub-slab vapor and indoor air monitoring be conducted approximately two years prior to the FYR due dates, in January (representing winter conditions) and July (representing summer conditions). The Vapor Intrusion Long-Term Monitoring and Building Inspection Plan (Navy, 2021c) includes the possibility of conducting monitoring sooner than every five (5) years if an event that could change building conditions, such as an earthquake, takes place. The recommendations also allow that if the results from the two (2) seasons are similar, then the monitoring program may also be reduced to winter only for subsequent monitoring events.

Building 85 is currently used for storage purposes and is not occupied on a regular basis, indoor air concentrations were no more than 3% of their respective PALs, and sub-slab concentrations did not exceed screening levels based on its BSAF, so the potential for vapor intrusion is low if building conditions remain the same. It was recommended that annual building use monitoring be performed, with the contingency of additional inspections and sub-slab vapor and indoor air monitoring every five (5) years if building use changes. No further actions were recommended for Building 1074, where no indoor air or sub-slab vapor exceedances were observed.

Results of the sampling are provided in Section 4.2.3.

Amendment Identification and Bench-Scale Study (Navy, 2023i). A laboratory and bench-scale study were conducted to assess the potential effectiveness of funnel-and-gate permeable reactive barrier (PRB) technology for a remedial alternative at OU 2 Area 8. The feasibility is dependent on site conditions, which include variable high salinity, tidal effects on groundwater flow direction, and the potential absence of an aquitard to minimize underflow beneath a PRB. Conceptually, the SubflowRx technology developed by Ai-Remedial Systems (Ai-RS) is a funnel-and-gate type PRB where sheet piling (funnel) directs groundwater to gates (PileGates) that house replaceable cartridges (CartridgeRx) containing candidate media and/or treatment amendments; the system acts as a potentially low-maintenance PRB with modular treatment capabilities.

2024 Seep Sampling. A seep sample with a field duplicate was collected at OU 2 Area 8 in March 2024 and analyzed for dissolved metals, total mercury, and VOCs in accordance with the drum investigation SAP that also included additional sampling at Area 2 (Navy, 2024j). This seep sample was collected to supplement the extensive terrestrial data collected in support of the supplemental RI, so that a data set that included data points comparable to all of the historical LTM data was available. The results of this seep sampling were not presented in a final report within this FYR reporting period.

Supplemental Remedial Investigation. A supplemental RI was conducted from June 2021 to February 2024 and the report is in progress. This report supplements the original RI for OU 2, finalized in 1993 (Navy, 1993a). The overall objective of the post-ROD investigation was to refine the CSM in support of alternative selection to mitigate site contamination from seeping onto the adjacent beach. Geophysical field investigations were completed in June 2021 to locate subsurface features such as utilities and previous remedial action components (i.e., slurry walls) as well as to delineate saltwater intrusion into the terrestrial freshwater aquifer.

Direct-push technology (DPT) soil and groundwater grab sampling was completed in May 2023. Soil samples were collected from unsaturated soil above the groundwater interface, the air/groundwater interface, and the bottom of the borehole. Field screening was used to select intervals for the collection of up to an additional three (3) grab soil samples and three (3) groundwater samples. Results of the field screening and laboratory results from the grab soil and groundwater samples were used to select locations for permanent groundwater monitoring wells and/or to determine whether data gaps exist.

Soil and groundwater samples were obtained from continuous-core, direct-push borings at 18 investigation locations and one (1) soil-only location where groundwater was not encountered. The deepest boring was 24 feet deep. The field team attempted 12

additional borings but could not complete them because of subsurface conditions.

2.2.3 OU 2 Operations, Maintenance, and Monitoring

As discussed for OU 1, LTM was also paused for OU 2 Area 8 in 2018, with more focused monitoring events performed in support of site recharacterization. LTM will be resumed once the LTM plan has been revised in collaboration with the EPA, Ecology, and Suquamish Tribe. Although the traditional LTM program has been paused, the other monitoring conducted during this period has met the intent of the ROD-required monitoring. The characterization data collected during this FYR period are provided in Section 4.2.

OU 2 Area 2 Monitoring. Since the OU 2 ROD (Navy, EPA, and Ecology, 1994), groundwater monitoring (i.e., LTM) has been conducted at OU 2 Area 2 to establish trends in COC concentrations and determine when LUCs can be discontinued. During this FYR period, the LTM program at Area 2 involved periodic sampling of groundwater from three (3) point of compliance monitoring wells (i.e., 2MW-1, 2MW-6, and MW2-8) for vinyl chloride (VC), with comparison of results to the RG for VC. The LTM program also involves periodic water level measurements to monitor the groundwater flow direction. Figure 2-2 includes the three LTM wells for OU 2 Area 2, as well as additional wells installed and sampled as part of the investigations during this FYR period.

A one-time groundwater sampling event for 1,4-dioxane occurred at Area 2 in 2007 to evaluate if this chemical of emerging concern was present. Concentrations of 1,4-dioxane in these samples were all below the screening level of 4 micrograms per liter (µg/L). Based on a decrease in the MTCA B cleanup level for 1,4-dioxane to 0.44 µg/L, the fourth FYR recommended two additional sampling events for 1,4-dioxane at Area 2 under the LTM program, which occurred in 2017 and 2018. Concentrations of 1,4-dioxane in these groundwater samples were either non-detect or below the lower screening level, so sampling of 1,4-dioxane at Area 2 was discontinued per the recommendation from the fourth FYR.

LTM sampling was conducted in 2023 and 2024 during this review period; however, the 2024 report was not finalized within this FYR period. In 2020 sampling was not conducted due to contract changes from one LTM contractor to a different contractor. No sampling was conducted at the three (3) existing LTM wells in 2021 or 2022 due to the soil and groundwater supplemental investigation conducted in 2022. The results of the LTM program are described in Section 4.2.

OU 2 Area 2 LUCs. As part of the remedy, LUCs were implemented to prevent residential land use and construction of domestic wells. The updated LUC Plan (Navy, 2020d) describes in detail the current land use and users, objectives of the LUCs, and

implementation of the LUCs for OU 2 Area 2. During this FYR period, annual LUC inspections were conducted to document that LUCs are being maintained and have met the following expectations stated in the OU 2 ROD:

- No new water wells have been installed, except for monitoring wells or wells that may be needed for future remedial actions.
- Access controls have been maintained and have prevented access.
- Current land use remains unchanged (i.e., industrial or commercial purposes only), and if changes are made, the change will be reviewed and approved in collaboration with Ecology and the EPA.
- Administrative procedures are in place to control digging at Area 2 and have been followed.

The results of the annual LUC inspections are provided in Section 4.3.

OU 2 Area 8 Monitoring. As described in the preamble to this monitoring section, LTM was paused in 2018, with more focused monitoring events performed in support of the site recharacterization. LTM will be resumed once the LTM plan has been revised in collaboration with the EPA, Ecology, and Suquamish Tribe. The characterization data collected during this FYR period are presented in Section 4.2.

OU 2 Area 8 LUCs. As part of the remedy, LUCs were initiated in 2000 to prevent exposure to soil and groundwater.

The updated LUC Plan (Navy, 2020d) describes in detail the current land use and users, objectives of the LUCs, and implementation of the LUCs for OU 2 Area 8. During this FYR period, annual LUC inspections were conducted to document that LUCs are being maintained and have met the following expectations stated in the OU 2 ROD:

- Access controls have been maintained and have prevented access.
- No new water wells have been installed, except for monitoring wells or wells that may be needed for future remedial actions.
- Current land use remains unchanged (i.e., industrial or commercial purposes only), and if changes are made, the change will be reviewed and approved in collaboration with Ecology and the EPA.
- Administrative procedures are in place to control digging at Area 8 and have been followed.

The results of the annual LUC inspections are presented in Section 4.3.

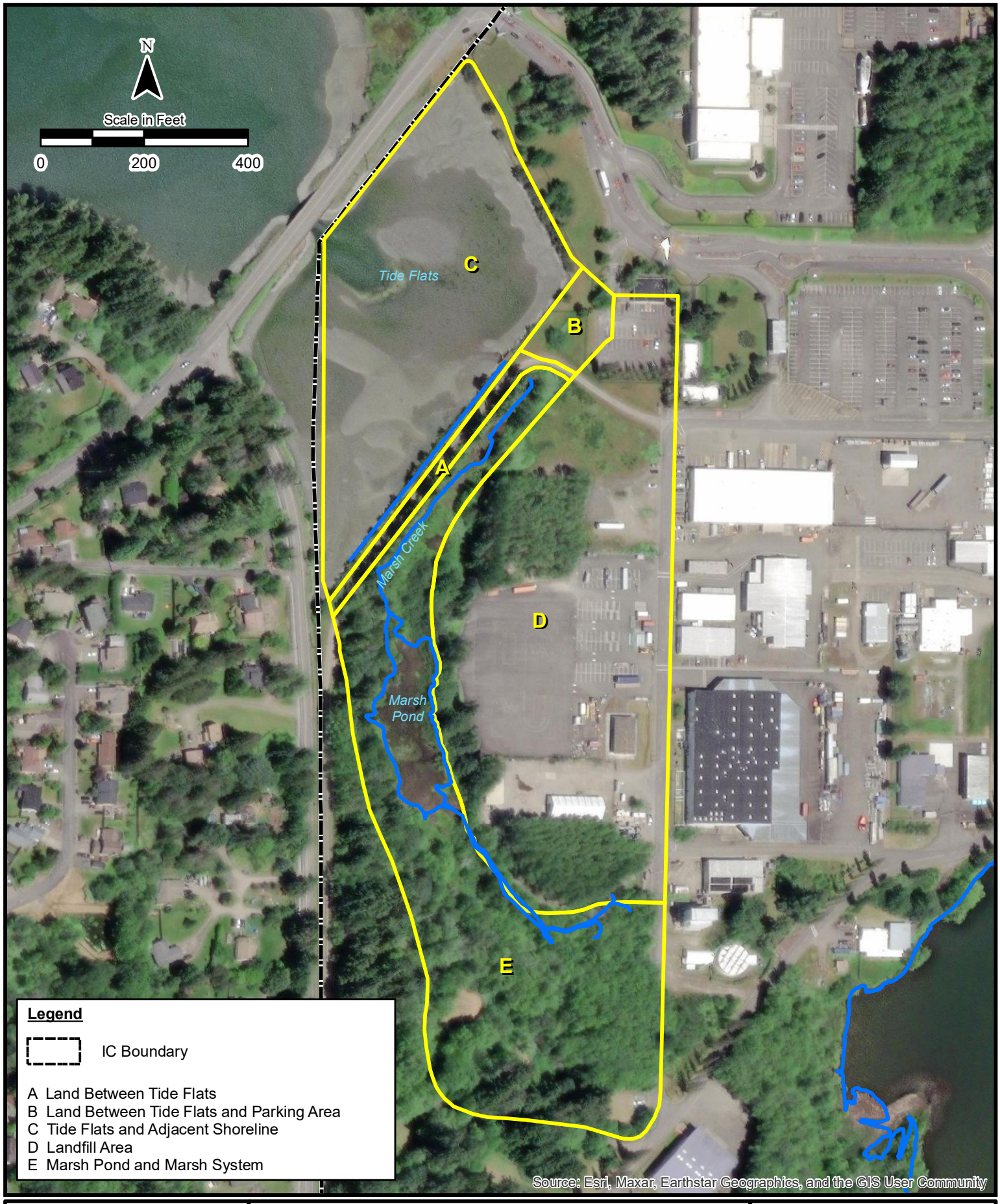

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Figure 2-1
OU 1 Land Use Control (LUC) Areas

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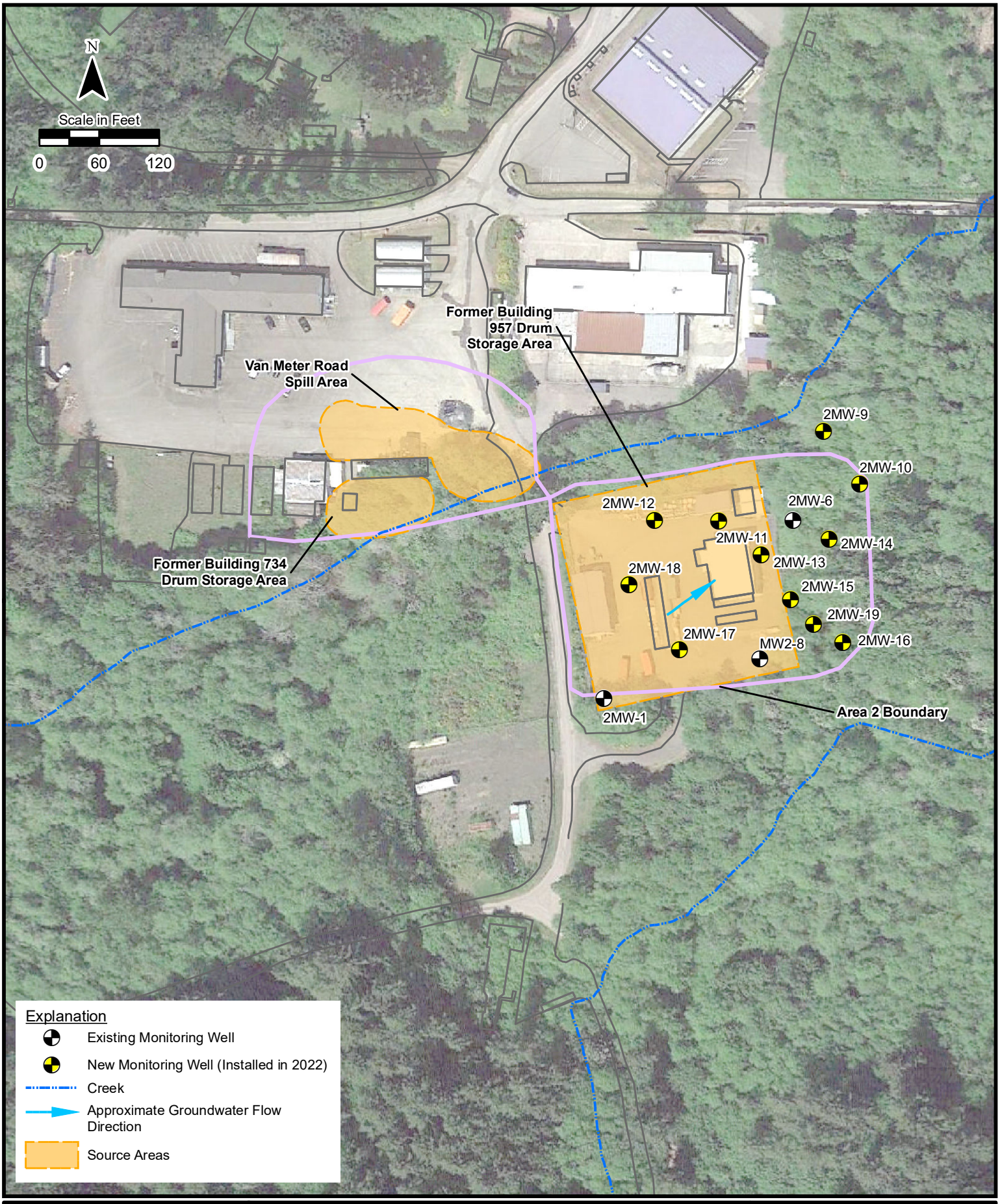

U.S. NAVY	**Figure 2-2** **OU 2 Area 2 Supplemental Investigation Sampling Locations**	NBK KEYPORT SIXTH FIVE-YEAR REVIEW

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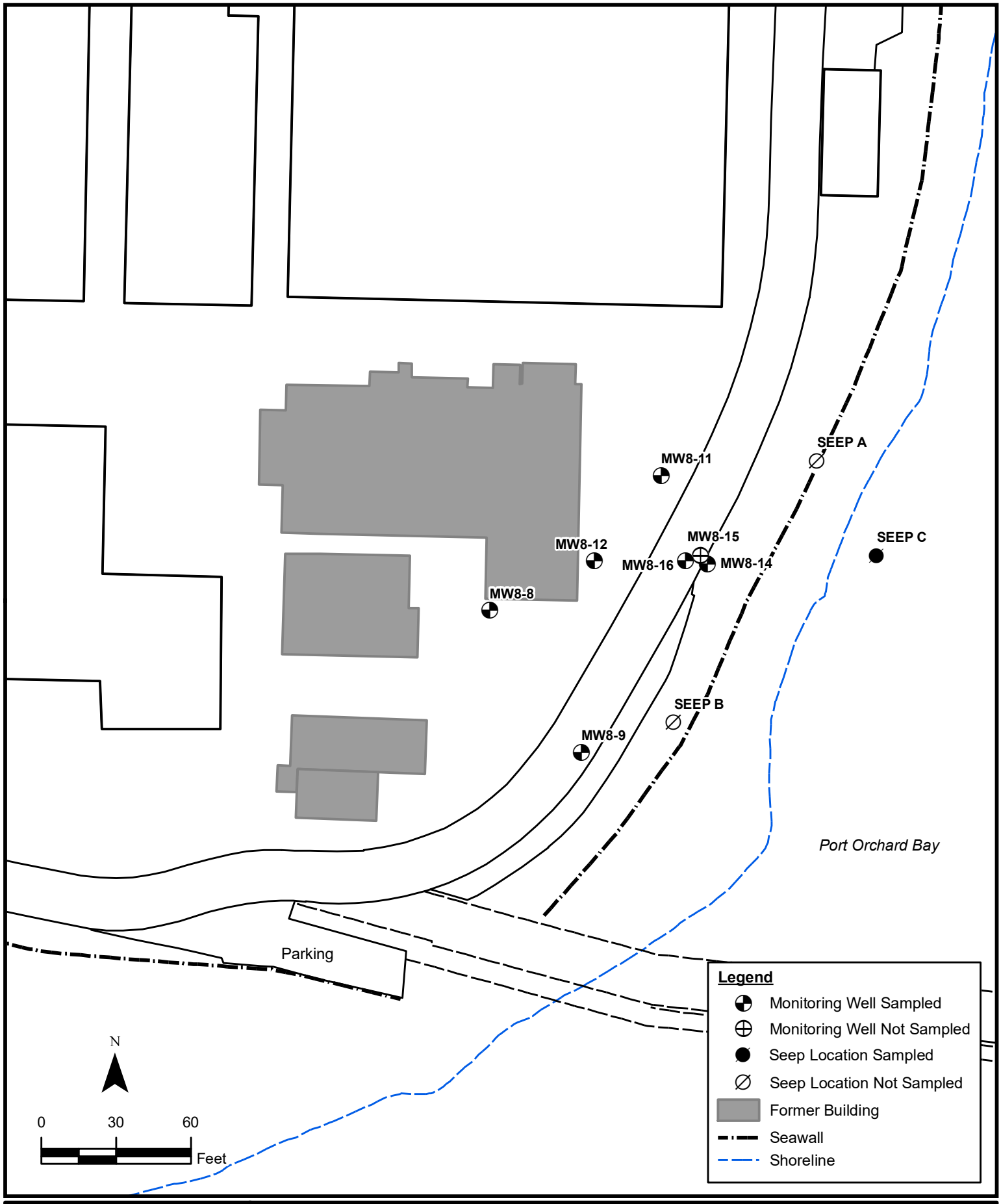

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Figure 2-3
OU 2 Area 8 Historical LTM Sampling Locations

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FIVE-YEAR REVIEW

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Table 2-1. Summary of Remedial Action for OUs 1 and 2

OU, Site	Reasonably Anticipated Land Use	COC Requiring Action	Media	RGs	RAOs[a]	Remedy Component	Remedy Construction Complete	Long-Term Management or Site Closeout Strategy
OU 1	Active military installation	VOCs	Soil, waste, vapor	No RGs were established in OU 1 ROD.	Prevent human exposure to soil and landfill waste. Prevent human exposure to landfill vapor. Prevent unacceptable risks to humans from soil and air above state MTCA B Levels.	Upgrade and maintain the landfill cover – Initial upgrade construction is complete and maintenance ongoing. LUCs: ongoing.	Yes	Maintain soil cover and phytoremediation plantation, as needed. Conduct annual LUC monitoring.
		1,1-DCA 1,2-DCA 1,1-DCE cis-1,2-DCE trans-1,2-DCE PCE 1,1,1-TCA TCE VC PCBs 1,4-dioxane (Not identified in OU 1 ROD)	Ground-water	800 µg/L 5 µg/L 0.5 µg/L 70 µg/L 100 µg/L 5 µg/L 200 µg/L 5 µg/L 0.5 µg/L 0.04 µg/L 0.44 µg/L (MTCA Method B Cleanup Level)	Prevent human exposure to groundwater as drinking water. Prevent unacceptable risks to humans and aquatic organisms due to migration of groundwater into adjacent aquatic environments.	Treat VOC hot spots in the landfill by phytoremediation: ongoing, including additional site characterization at the South Plantation for remedy optimization. Conduct LTM, including phytoremediation monitoring, intrinsic bioremediation monitoring, and risk and compliance monitoring: ongoing until RGs are met. LUCs: ongoing. Take contingent remedial actions for off-base domestic wells, if necessary: ongoing monitoring.	Yes	Conduct LTM until RGs are met. Conduct annual LUC monitoring.
		1,1-DCA 1,2-DCA 1,1-DCE cis-1,2-DCE trans-1,2-DCE PCE 1,1,1-TCA TCE VC PCBs	Surface Water	None 59 µg/L 1.9 µg/L None 33,000 µg/L 4.2 µg/L 41,700 µg/L 56 µg/L 1.9 µg/L 0.04 µg/L	Prevent unacceptable risks to humans due to ingestion of shellfish. Prevent unacceptable risks to aquatic organisms due to surface water exposure.	Upgrade the tide gate: construction complete. Conduct LTM: ongoing until RGs are met.	Yes	Conduct LTM until RGs are met. Conduct annual LUC monitoring.
		1,1-DCA 1,2-DCA 1,1-DCE cis-1,2-DCE trans-1,2-DCE PCE 1,1,1-TCA TCE VC PCBs	Sediment	State Sediment Quality Standards/Bioassays[b] 12 mg/kg organic carbon	Prevent unacceptable risks to humans due to ingestion of shellfish as defined by concentrations in littleneck clams (see tissue). Prevent unacceptable risks to aquatic organisms due to sediment exposure.	Remove PCB-contaminated sediments from seep location: completed. Upgrade the tide gate: construction complete. Conduct LTM: ongoing LTM to monitor contaminant concentrations and compare to the time of the OU 1 ROD.	Yes	Conduct LTM to monitor migration. Conduct annual LUC monitoring.
		1,1-DCA 1,2-DCA 1,1-DCE cis-1,2-DCE trans-1,2-DCE PCE 1,1,1-TCA TCE VC	Marine Tissue	304 mg/kg 0.33 mg/kg 0.051 mg/kg 30 mg/kg 61 mg/kg 0.59 mg/kg 61 mg/kg 2.8 mg/kg 0.016 mg/kg	Prevent exposure to humans due to ingestion of shellfish above a cumulative incremental cancer risk of 1 x 10^{-5} or above a noncancer hazard index of 1.0. Prevent exposure to aquatic organisms above the ecological risk-based screening levels (Appendix J of Navy [1997a]).	Upgrade the tide gate: construction complete. Conduct LTM: ongoing LTM to monitor contaminant concentrations and compare to the time of the OU 1 ROD.	Yes	Conduct LTM to evaluate potential bioaccumulation of PCBs. Conduct annual LUC monitoring.

Table 2-1 (continued). Summary of Remedial Action for OUs 1 and 2

OU, Site	Reasonably Anticipated Land Use	COC Requiring Action	Media	RGs	RAOs[a]	Remedy Component	Remedy Construction Complete	Long-Term Management or Site Closeout Strategy
		PCBs		0.015 mg/kg (HH)/ 2.6 mg/kg (Eco)				
OU 2, Area 2	Active military installation	TCE VC	Ground-water[e]	5 µg/L 0.1 µg/L (assumed PQL at the time of the OU 2 ROD; current PQLs can achieve current RG of 0.029 µg/L)	Prevent human exposure to groundwater as drinking water and inhalation of volatiles while showering. Reduce concentrations of contaminants in groundwater to drinking water quality.	Install additional upgradient wells to confirm no upgradient source of COCs exists: construction complete. Conduct LTM: ongoing until RGs are met for VC (already met for TCE). LUCs: ongoing.	Yes	Conduct LTM until RGs are met. Conduct annual LUC monitoring.
		TCE VC	Soil[e]	MTCA Method B Cleanup Levels	Prevent human exposure to soil or vegetables grown in soil (residential).	LUCs: ongoing.		Conduct annual LUC monitoring.
OU 2, Area 8	Active military installation	Cadmium Chromium III[c] Chromium VI[c] Chromium (total) 1,1-DCE cis-1,2-DCE PCE 1,1,1-TCA TCE	Ground-water[f]	5 µg/L 16,000 µg/L 80 µg/L 50 µg/L 7 µg/L 70 µg/L 5 µg/L 200 µg/L 5 µg/L	Prevent human exposure to groundwater as drinking water. Protect sediments and surface water quality offshore of Area 8 in Port Orchard Bay from contaminants in groundwater that could cause future adverse impacts or human health risks.	Install additional monitoring wells: construction complete. Conduct LTM of groundwater, seep water, sediment, and tissue in the intertidal zone of Area 8: ongoing until RGs are met. LUCs: ongoing. Assess risks to human health and the environment using the sediment and tissue monitoring data: completed and presented in this FYR report. Implement contingent groundwater control actions if Area 8 groundwater is demonstrated to be a significant source of the chemicals that cause risk in sediments or tissue: to be completed based on recent ecological risk assessment.	Yes	Conduct LTM until RGs are met. Conduct annual LUC monitoring.
		Arsenic[d] Cadmium Chromium VOCs	Soil[f]	MTCA Method B Cleanup Levels	Prevent human exposure to soil. Protect groundwater and surface water quality from soil containing COCs.	Soil hot spot removal: construction complete. LUCs: ongoing.		Conduct annual LUC monitoring.

[a]The RAO Statements included in this table are summary versions of the RAO statements from the OU 1 and OU 2 RODs. Please refer to the RODs for the complete text of each RAO statement.
[b]Washington State Sediment Quality Standards (SQS) value of 12 mg/kg for PCBs was set at the time of the signed OU 1 ROD. Current SQS values are applicable to all other COCs as established in the OU 1 ROD. Bioassays will be performed if chemical results fail the SQS as established on page 95 of the OU 1 ROD.
[c]Trivalent and hexavalent chromium (chromium III and VI, respectively) were dropped from COC list.
[d]Concentrations were found to be below background, so contaminant was dropped from COC list.
[e]The third FYR explains that the LTM program at OU 2 Area 8 tracks cadmium, chromium, TCE, PCE, 1,1-DCE, cis-1,2-DCE, and 1,1,1-TCA in groundwater based on historical detections above ARARs. Other chemicals noted as COCs and potential COCs in the ROD, have either not been detected, or detections were far below the ARARs.
[f]Similar to groundwater at OU 2 Area 8, the OU 2 ROD contains tables that list COCs and potential COCs. However, due to limited detections, concentrations far below ARARs and based on considerations explained in the third FYR, the list of routinely tracked COCs in soils was focused to a subset of COCs for subsequent monitoring.

ARAR – applicable or relevant and appropriate regulation
COC – chemical of concern
DCA – dichloroethane
DCE – dichloroethene
LTM – long-term monitoring
LUC – land use control
MTCA – Model Toxics Control Act
mg/kg – milligrams per kilogram
OU – operable unit
PCB – polychlorinated biphenyl
PCE – perchloroethene, or tetrachloroethene
µg/L – micrograms per liter
PQL – practical quantitation limit
RAO – remedial action objective
RG – remedial goal
ROD – Record of Decision
SVOC – semi-volatile organic compound
TCA – trichloroethane
TCE – trichloroethene
VOC – volatile organic compound

3.0 Progress Since Last Five-Year Review

Per EPA FYR Guidance (EPA, 2016), Table 3-1 details the protectiveness statements and determinations from the fifth FYR for NBK Keyport (Navy, 2020a).

The fifth FYR identified four issues with accompanying recommendations intended to ensure future long-term protectiveness of the remedies. An additional 13 recommendations were made in the fifth FYR for findings identified through the FYR process that may improve performance of the remedy, reduce costs, improve management of O&M, accelerate site closeout, conserve energy, and/or promote sustainability, but do not affect the current and/or future protectiveness of the remedy. Tables 3-2 (recommendations affecting protectiveness) and 3-3 (recommendations not affecting protectiveness) list these recommendations and provide the status of each recommendation (e.g., under discussion, ongoing, addressed in next FYR, considered but not implemented, or completed).

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Table 3-1. Protectiveness Statement(s) and Determination(s) from the Fifth Five-Year Review

Operable Unit/Site	Protectiveness Determination	Protectiveness Statement(s)
1	Short-Term Protective	The remedy at OU 1 is short-term protective. Exposure pathways that could result in unacceptable risks are being controlled and monitored via LUCs while further information is being obtained. Investigation work is ongoing to verify the risk conclusions in the OU 1 ROD, to allow evaluation of potential additional removal or remedial action(s) that could be taken to shorten the overall restoration timeframe, and to ensure the remedy is protective in the long term.
2	Not Protective	The remedy at OU 2 Area 2 is short-term protective. Exposure pathways that could result in unacceptable risks are being controlled and monitored via LUCs; however, the consistent VC detections above the RG and recent increased concentration in well 2MW-6 may be an indication that cVOC mass detected in shallow groundwater (i.e., wells 2MW-1, 2MW-3, and MW2-10) during the RI may have since migrated deeper and further downgradient than revealed by the monitoring network. The remedy at OU 2 Area 8 is protective of human health; however, it is not protective of ecological receptors based on a finding of unacceptable risk, for which a contingent remedial action has not yet been implemented, as required by the ROD. To identify a feasible contingent groundwater control action, the Navy will perform a supplemental RI and focused FS. Once identified, and agreed upon by regulators and stakeholders, the Navy will perform remedial design, implement remedial action, and potentially conduct a shoreline repair to address elevated COC concentrations in intertidal sediment and on-going discharge of these COCs in seep water. A ROD amendment or Explanation of Significant Differences (ESD) will be prepared to document the contingent groundwater control action taken. The human health risk assessment at the Area 8 beach intertidal zone concluded that, despite the presence of several COCs in the beach sediment and clam tissue at concentrations exceeding background and reference area concentrations, the incremental site risk over reference area risk for Suquamish subsistence and recreational receptors meets target health goals. The ecological risk assessment concluded that there was no risk to higher trophic level species, but acute and chronic exposure to accumulated contaminants in sediment pose a current potential hazard to benthic organisms based on the bioassay results/endpoints.
Sitewide	Not Protective	The remedies at NBK Keyport are not protective based on a finding of unacceptable ecological risk at OU 2 Area 8.

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Table 3-2. Status of Recommendations from the Fifth Five-Year Review

Item No.	Issue	Recommendation	Current Status	Current Implementation Status Description	Reference or Completion Date (if applicable)
Operable Unit 1					
1	Investigations pursuant to recommendations from the fourth FYR (Navy, 2015a) have documented subsurface geology and contaminant distribution that differs significantly from the CSM understanding at the time of the ROD (Navy, EPA, and Ecology, 1998).	Complete the on-going investigations to update the CSM.	Complete	An update CSM is included in the *Supplemental Remedial Investigation Report Site Recharacterization, Operable Unit 1,* which was finalized in August 2023. The Supplemental RI and updated CSM are discussed in Section 4.2.1.	Navy, 2023a
		Complete the planned updates to the human health and ecological risk assessments using the updated CSM and incorporating the latest guidance and ARARs.	Ongoing	Additional sampling was conducted in 2021 to support the HHRA/ERA addendum. The results of the field investigation are summarized in the *Human Health and Ecological Risk Assessment Field Investigation Report Keyport, Operable Unit 1*. A HHRA/ERA addendum is being performed with the draft report submitted for Keyport Project Team review in 2024.	Navy, 2024a
		In collaboration with the project team, review and revise (as appropriate) the points of compliance and RAOs.	Ongoing	Completion of this recommendation is pending completion of the ongoing work to update off-site transport pathway elements of the CSM and the HHRA/ERA addendum. Results of this work will be used to revise points of compliance and RAOs, if necessary.	N/A
		Based on the results of items 1 through 3, evaluate the need for any early remedial actions and/or a focused FS leading to an optimized remedy.	Ongoing	A path forward will be decided once the HHRA/ERA addendums are completed.	N/A
2	Investigations pursuant to recommendations from the fourth FYR (Navy, 2015a) have documented an area of the landfill north of the north phytoremediation plantation with elevated PCB concentrations in soil that may represent a discrete source of the PCBs consistently detected in water from seep SP1-1, and a potential source of recontamination to an area of the wetland previously remediated.	Conduct an investigation to delineate and characterize the potential PCB source in soil.	Completed	During consultation with the Keyport Project Team, it was determined that extensive investigation to determine the exact location of PCB sources within the landfill footprint is not the best approach for improving protection of human health and the environment. There is the strong potential for many small discrete source areas within the landfill resulting from variable waste disposal practices over time, and identifying and delimiting all of these source areas would use considerable resources. Instead, resources have focused on better characterizing PCB concentrations at the point of discharge to the receptor. Characterization is focused on the seep discharging into the wetland and immediately downstream. A baseline ISM investigation was completed, and a second sampling event was conducted based on the results of the baseline sampling. The Navy also collected soil samples in the upper 6 feet in the area of potential PCB sources.	Navy, 2022b, 2023h
		In collaboration with the project team, evaluate the need for a removal action to address the PCB source.			

Table 3-2 (continued). Status of Recommendations from the Fifth Five-Year Review

Item No.	Issue	Recommendation	Current Status	Current Implementation Status Description	Reference or Completion Date (if applicable)
				Elevated PCB concentrations appear to be widespread in soil within the landfill waste body from at least the middle of the North Plantation and northward. ISM sampling of sediment from seep SP1-1 to the tide gate was performed in September 2023 as a follow up to initial ISM in this area in June 2021. The PCB evaluation concluded that total PCB concentrations in sediment in the distal reach of Marsh Creek at OU 1 from seep SP1-1 to the tide gate exceed the marine sediment cleanup objective (SCO) of 12 milligrams per kilogram (mg/kg) organic carbon normalized (OC) in several of the ISM decision units.	
Operable Unit 2 Area 2					
3	The consistent VC detections above the RG and recent increased concentration in well 2MW-6 may be an indication that cVOC mass detected in shallow groundwater (i.e., wells 2MW-1, 2MW-3, and MW2-10) during the RI may have since migrated deeper and further downgradient than revealed by the monitoring network.	Conduct a limited data gap investigation to refine the CSM and verify the leading edge of the cVOC plume, both laterally and vertically, at OU 2 Area 2.	Complete	Additional sampling was conducted in summer 2022 with results summarized in the *Soil and Groundwater Supplemental Investigation Report, Operable Unit 2 Area 2 Van Meter Road Spill Drum Storage Site*. The conclusion and recommendation of the investigation were: 1. the soil and groundwater analytical results indicated that TCE and VC concentrations exist outside of the previously installed point of compliance groundwater monitoring wells (2MW-1, 2MW-6, and MW2-8) and 2. it was recommended that the newly installed monitoring wells (2MW-9 through 2MW-19) are added to the long-term monitoring network for comparison to PALs. An evaluation of the available data will be performed as part of this sixth FYR, and a recommendation will be made as to whether additional investigation is needed.	Navy, 2023g
Operable Unit 2 Area 8					
4	During this FYR period, the HHRA concluded that no contingency/additional actions are necessary to protect human health. However, the ERA concluded that acute and chronic exposure to accumulated contaminants in sediment poses	Implement a contingent groundwater control action as required by the selected remedy (Navy, EPA, and Ecology, 1994). To identify a feasible contingent action, perform a supplemental RI and focused FS. Once identified and agreed upon by regulators and stakeholders, perform remedial design, implement the remedial action, and potentially conduct a shoreline repair to	Ongoing	A supplemental RI for Area 8 is being conducted and expected to be submitted for Keyport Project Team review in early 2025. The Navy also performed a bench-scale study of a potential remedy optimization technology. A focused FS will be conducted following the supplemental RI if deemed necessary.	N/A

Table 3-2 (continued). Status of Recommendations from the Fifth Five-Year Review

Item No.	Issue	Recommendation	Current Status	Current Implementation Status Description	Reference or Completion Date (if applicable)
	a current potential hazard to benthic organisms based on the bioassay results/endpoints. This area of exposure with unacceptable risk is well delineated and of limited extent within the intertidal zone.	address elevated COC concentrations in intertidal sediment and on-going discharge of these COCs in seep water. Prepare a ROD amendment or Explanation of Significant Differences (ESD) to document the contingent action taken.			

N/A not applicable

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Table 3-3. Status of Recommendations from Other Findings in the Fifth Five-Year Review

Item No.	Issue	Recommendation	Current Status	Current Implementation Status Description	Reference or Completion Date (if applicable)
Sitewide					
1	During this FYR period, the PQL used for VC is equal to the ROD RG which is associated with a risk of 2 x 10^{-5}. This risk exceeds the ROD target risk goals and MTCA allowable risk but is within EPA's target range.	Adopt lower reporting limits as measured concentrations decrease to near the current PQL, and before any decision-making regarding unrestricted use of the sites.	Complete	The *Tier I Sampling and Analysis Plan Groundwater Sampling at OU 1, Area 1 Former Landfill and Long-Term Monitoring at Area 2, OU 2 Van Meter Road Spill/Drum Storage Site* states "an RG of 0.5 µg/L was established by the ROD based upon the PQL. Since the laboratory selected for analysis can currently achieve an LOQ of 0.020 µg/L, comparison of sample results to the current MTCA Method B cleanup level of 0.029 µg/L will be performed."	Navy, 2021d
2	PFAS compounds have been detected in groundwater samples from existing monitoring wells at OU 1 and OU 2.	Include PFAS in the supplemental remedial investigations currently underway at OU 1 and OU 2 Area 8.	Ongoing	Since the fifth FYR the Navy's approach for investigating and addressing PFAS has changed. PFAS will be addressed under separate RI efforts throughout the facility because: 1) PFAS science and treatment technology are still under development; 2) regulatory values and risk assessment protocols are still under development; 3) risk results from other non-PFAS contaminants at both OU 1 and OU 2 Area 8 already warrant revision of the selected remedies, so the Navy intends to evaluate remedy revision based on these findings instead of deferring action in anticipation of advances in PFAS regulatory, science, and technology development; and 4) the nature and extent of PFAS impacts have not yet been fully defined. The presence of PFAS in site media will be acknowledged and considered during the future FFS work at both OU 1 and OU 2 Area 8. The need for an additional remedy revision to address PFAS will be evaluated as needed once the PFAS RI and risk assessment efforts are completed. Initial PFAS results were included in the *Supplemental Remedial Investigation Report Site Recharacterization, Operable Unit 1*. In addition, a PFAS preliminary assessment (PA) was completed in 2020, and a site inspection (SI) was completed in 2023. Initial PFAS sampling was also conducted during the ongoing OU 2 Area 8 supplemental RI.	Navy, 2023a; Navy, 2020e; Navy, 2023j

Table 3-3 (continued). Status of Recommendations from Other Findings in the Fifth Five-Year Review

Item No.	Issue	Recommendation	Current Status	Current Implementation Status Description	Reference or Completion Date (if applicable)
Operable Unit 1					
3	The OU 1 LTM reports continue to use ½ the highest "U" value when generating trend graphs, which appears not to conform to the recommendations of the fourth FYR.	In accordance with Ecology's comments on the recent LTM reports, present a statistical evaluation of contaminant concentration trends over time in each LTM report.	Ongoing	LTM sampling was put on hold prior to the start of this FYR period; therefore, no trend graphs have been generated. Recent workplans are clear regarding how undetected values will be treated during analysis. The HHRA/ERA Work Plan states: "In addition, the data evaluation describes how the analytical data will be assessed and managed in the HHRA/ERA addendum including: how non-detected chemicals and duplicates are treated, how data qualifiers influence the data, and how the reference area dataset is used to evaluate incremental site risk in excess of risk associated with levels of naturally occurring substances (e.g., metals) or other chemicals with potential sources other than the site (e.g., PFAS, PCBs, dioxins, and PAHs)."	N/A
4	The ROD RG for VC was based on the PQL achievable at the time of the ROD; however, SIM analysis is now available that can achieve lower reporting limits.	Compare VC results to current ARARs, including analyzing surface water samples for VC using SIM analysis to achieve a lower reporting limit.	Complete	See Item #1.	Navy, 2021d
5	Currently, the surface water PCB data are not compared to ARARs for the protection of human health.	Compare future surface water PCB data to the current ARAR for human health exposure pathways (including incidental ingestion and finfish and shellfish consumption), given that the concentration can now be achieved by the laboratories using congener analysis.	Complete	The *Supplemental Remedial Investigation Report Site Recharacterization, Operable Unit 1* compared PCB concentrations in groundwater, surface water, and porewater to the current surface water ARAR of 170 pg/L. However, several non-detect samples had reporting limits that were greater than 170 picograms per liter (pg/L). The recommendation has been incorporated into the human health risk assessment addendum that is currently in progress.	Navy, 2023g

Table 3-3 (continued). Status of Recommendations from Other Findings in the Fifth Five-Year Review

Item No.	Issue	Recommendation	Current Status	Current Implementation Status Description	Reference or Completion Date (if applicable)
6	Information and revised methods of evaluating environmental media contained in the 2013 revised SMS and in the Sediment Cleanup User' Manual (SCUM) manual were incorporated into the recent ERA for OU 2 Area 8, in addition to updates that have occurred to federal and state ERA guidance, guidelines, and policy since the OU 2 ROD.	Utilize the OU 2 Area 8 ERA Work Plan to the extent practical for any future ERAs conducted at NBK Keyport, in particular the upcoming planned ERA for OU 1, such that risk assessments are performed consistently across OUs.	Completed	The 2021 SCUM guidance and 2013 SMS regulation are referenced in the OU 1 Human Health and Ecological Risk Assessment Work Plan.	Navy, 2022d
7	During annual LUC inspections and the FYR site inspection, several cracks were observed in the asphalt pavement of the Central Landfill. Also, alder trees and other brush are growing up through penetrations in the asphalt pavement near old foundations in the southern portion of the Central Landfill.	Conduct landfill venting and cover upgrades, as planned in FY 2021, to address potential risks from methane migration beyond the landfill boundaries and prevent direct contact with the underlying soils in the future, respectively.	Ongoing	LUC inspection reports reported cracks in pavement every year from 2020 to 2024. The Navy will incorporate the concepts of landfill venting and cover upgrades into the selection process for remedy optimization.	Navy, 2024k; 2024c; 2023d; 2022a; 2020b.
Operable Unit 2 Area 2					
8	During this FYR period (i.e., total of three [3] monitoring events), all 1,4-dioxane results were either non-detect or below the MTCA B cleanup level of 0.44 μg/L.	Discontinue monitoring for 1,4-dioxane at OU 2 Area 2, it is not present at levels which pose unacceptable risk.	Completed	1,4-dioxane monitoring was discontinued as recommended in the 2019 LTM Report dated August 26, 2020. Therefore, 2019 was the last time 1,4-dioxane was sampled at Area 2.	Navy, 2020f

Table 3-3 (continued). Status of Recommendations from Other Findings in the Fifth Five-Year Review

Item No.	Issue	Recommendation	Current Status	Current Implementation Status Description	Reference or Completion Date (if applicable)
Operable Unit 2 Area 8					
9	During this FYR period, several COCs (including 1,1-DCE, 1,1,1-TCA, arsenic, lead, mercury, thallium, and zinc) in groundwater, seep water, and surface water samples were consistently, or more frequently than not, detected below their RGs. In addition, no RG was established in the ROD for VC, which is a breakdown product of the chlorinated solvent COCs present at the site.	As part of the contingent actions for OU 2 Area 8 (including a ROD amendment), update the list of COCs to reflect current conditions in groundwater, seep water, and surface water.	Ongoing	Supplemental RI that is in progress analyzed for a variety of contaminants and will evaluate where there are exceedances in soil and groundwater. The future ROD amendment will modify the COC list as necessary.	N/A
10	Although VC is not a COC established by the ROD, it is a breakdown compound of other chlorinated solvent COCs and should be included in the LTM analyte list to provide a comprehensive understanding of COC fate and transport over time.	Add VC to the LTM analyte list and compare results to current ARARs to evaluate the magnitude and extent of this contaminant at the site.	Ongoing	VC will be added to the LTM analyte list once LTM sampling resumes following the supplemental RI. The *Tier I Sampling and Analysis Plan Long Term Monitoring Area 1 Former Landfill and Area 2 Van Meter Road Spill and Drum Storage Operable Units 1 AND 2* states "VC will also be added to the LTM program at Area 8 during scoping of the future LTM QAPP to evaluate chlorinated solvent degradation over time."	Navy, 2021d

Table 3-3 (continued). Status of Recommendations from Other Findings in the Fifth Five-Year Review

Item No.	Issue	Recommendation	Current Status	Current Implementation Status Description	Reference or Completion Date (if applicable)
11	During the 2018 vapor intrusion investigation, cVOC concentrations in sub-slab vapor exceeded PALs underneath Buildings 82, 85, and 98; however, the vapor intrusion pathway was found to be incomplete.	Prepare a building inspection and monitoring plan based on the recommendations of the vapor intrusion study report to ensure that the vapor intrusion pathway remains incomplete. Include annual foundation inspections for Buildings 82, 85, and 98 and paired indoor air and sub-slab vapor monitoring every five (5) years for Buildings 82 and 98. Add paired indoor air and sub-slab vapor monitoring every five (5) years for Building 85 if warranted based on future changes in building use or occupancy.	Completed	The *Final Vapor Intrusion Long-Term Monitoring and Building Inspection Plan* was completed in 2021 and building inspections have been conducted annually during this FYR period. Paired indoor air and sub-slab vapor monitoring was conducted in Buildings 82 and 98 in support of this FYR as recommended in the building inspection plan. The results were reported in the 2024 *Final Indoor Vapor Intrusion Sampling* report.	Navy, 2021c Navy, 2024g
Operable Units 1 and 2					
12	Weather pattern changes (i.e., local atmospheric pressure and wind conditions) may significantly impact the magnitude and duration of saltwater intrusion and ultimately, the timeframe when best to sample groundwater for freshwater contaminants.	Update the LTM Work Plan accordingly to use a downhole conductivity probe to identify the saltwater interface in each monitoring well (above which is the ideal/most representative depth for sampling groundwater) prior to sample collection.	Ongoing	This recommendation will be considered during future LTM planning.	N/A
Site 23					
13	Site 23 was removed from the most recent IC Plan (Navy, 2017a).	Add Site 23 back into the LUC Plan, along with the other LUC only sites (i.e., Sites 7 and 22), to ensure LUCs are adequately implemented and maintained, preventing exposure to contaminated soil and groundwater.	Complete	Site 23 and Areas 7 and 22 were included in the 2020 through 2024 IC inspections.	Navy, 2024c; Navy, 2023d; Navy, 2022a; Navy, 2020b.

N/A not applicable

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4.0 Five-Year Review Process

4.1 Community Notification, Involvement, and Interviews

There are specific requirements pursuant to CERCLA Section 117(a), as amended, for certain reports to be released to the public and the public notified of proposed cleanup plans and remedial actions. The community notification and involvement activities for NBK Keyport are described below.

4.1.1 History of Community Involvement

The community has historically been informed of progress at NBK Keyport through fact sheets, public notices, open houses, public meetings, and bus tours of the sites. The community had substantial input into the remedy for OU 1 (i.e., the former landfill) causing the Navy to re-evaluate the proposed plan and segregate OU 1 from OU 2 to allow for continued public input at OU 1. The proposed plans for OUs 1 and 2 were circulated for public comment prior to finalization of the RODs. Key documents have been made available for review at Navy facilities; the Kitsap Regional Library in Bremerton, Washington; and the Poulsbo Branch Library in Poulsbo, Washington. In addition, a NAVFAC Northwest website repository was added, with the previous FYRs, current questionnaire, and LUC documentation, to support involvement in this FYR. The link to the website repository is:

https://pacific.navfac.navy.mil/Facilities-Engineering-Commands/NAVFAC-Northwest/Our-Services/Environmental-Stewardship/Environmental-Restoration/Naval-Base-Kitsap-Keyport/

A community relations plan was prepared in 1990 and most recently updated in 2008. The Navy has contracted for update of the 2008 plan using the EPA's 2020 Superfund Community Involvement Handbook and EPA Toolkit (EPA, 2020), with an internal draft document due to the Navy in late 2025.

In 1988, a Technical Review Committee was established, with representatives from the public and government entities. In March 1995, the Technical Review Committee was replaced with a Restoration Advisory Board (RAB). The RAB members included representatives of the Navy, regulatory agencies, civic groups, private citizens, tribal governments, local governments, and environmental activist groups. The RAB remained active through all phases of remedy constriction and implementation but was ultimately disbanded in October 2004 due to lack of continued interest in maintaining the RAB. In 2024, the Navy surveyed local citizens and organizations to evaluate whether the public would be interested in restarting the RAB at NBK installations. Questionnaire links were

widely distributed to community members and other interested parties, including nine (9) Tribal representatives, via the following methods:

- Postcards mailed to 21,690 local contacts. The mailing distribution area was defined as a 1-mile radius from NBK and included parcel owners outside of the radius who owned property within the mailing distribution area.
- Press release by Naval Facilities Engineering Systems Command (NAVFAC) Northwest Public Affairs Officer (PAO).
- Public notices published:
    - *North Kitsap Herald* and *Port Orchard Independent* newspapers (digital and print)
    - *Kitsap Sun* (digital and print)
- E-mail notification and an e-mail reminder by the NAVFAC Northwest PAO to approximately 480 contacts.
- Social media posts (Facebook - https://www.facebook.com/kitsapnavy/) and a reminder post before close of questionnaire by the NAVFAC Northwest PAO.
- Direct outreach to local Tribal contacts by the NAVFAC Northwest Regional Tribal Coordinator.

Four hundred respondents (an approximate 2.4% response rate, based on the postcards sent to residents) representing a cross section of the community, including local residents, business owners, city department heads, environmental groups, and local government officials, answered the questionnaire. The majority (~65%) of the respondents felt that a RAB should be formed for the NBK installations (including NBK Bangor, NBK Bremerton, Jackson Park Housing Complex, NBK Keyport, NBK Manchester, and Naval Hospital Bremerton; Navy, 2024n).

The Navy is working to establish the new RAB, with meetings planned to start by the end of 2025. The new RAB is planned to address all of NBK, including NBK Keyport.

The town of Keyport also has the Keyport Improvement Club (KIC), which was incorporated in 1921 (http://www.keyport98345.com/). KIC is a group of volunteers who work on events and projects to strengthen the community and make life better for Keyport residents. KIC serves as an unofficial link between the Keyport community and larger organizations such as Kitsap County government departments, the Navy, the Port of Keyport, and the Red Cross. KIC conducts periodic meetings to discuss community issues and concerns and also organizes community meetings, as needed, to connect Keyport to the larger network of Kitsap County. The Navy RPM provides status updates

to the tenant Commanding Officer (CO) of Naval Undersea Warfare Center (NUWC) Keyport regarding installation restoration activities at NBK Keyport, who then briefs KIC members, as requested. KIC has also invited NUWC Keyport personnel and the CO to attend their meetings and update them with regard to the CERCLA sites.

4.1.2 Community Involvement During the Five-Year Review Period

During this FYR period, the KIC was contacted and provided an avenue for obtaining public input on the progress of the remedies at NBK Keyport.

A public notice was published by the Navy, informing the community that the Navy was intending to initiate this sixth FYR for NBK Keyport. The public notice was published in the following newspapers:

- *Kitsap Sun* (on August 29 and 30 and September 1, 2024)

The proof of the public notice is provided as Appendix A. The public notice was also posted on the NAVFAC website (https://pacific.navfac.navy.mil/Facilities-Engineering-Commands/NAVFAC-Northwest/Our-Services/Environmental-Stewardship/Environmental-Restoration/Naval-Base-Kitsap-Keyport/). The notification provided information on why the FYR was being conducted; what sites were included in the FYR; when the FYR would be completed; how the public could receive additional information; and established a 30-day review period for the public to provide questions or comments on the FYR process for NBK Keyport. The Navy did not receive any feedback or comments as a result of the public notice of intent.

Similar to the notice of intent to conduct the FYR, a notice of completion for the FYR will be published in the *Kitsap Sun* as well as posted on the NAVFAC website. The notice will include the protectiveness determinations and statements and a website link to the completed FYR report.

4.1.3 Interviews During the Five-Year Review Period

As part of the FYR process, a variety of organizations and groups, including the EPA, Ecology, Kitsap Public Health District, the Suquamish Tribe, and community members, were contacted to participate in the interview process. A set of interview questions was developed and tailored to specific categories of interview candidates (i.e., either Keyport Project Team or community member). The interview questions and instructions were transmitted via email to the regulatory agencies and the Suquamish Tribe on September 9, 2024. The community member questionnaire was posted to the NAVFAC Northwest website in August 2024. Instructions and link to the questionnaire were subsequently provided to KIC members via the KIC President. In total, three (3) completed interview questionnaires were received and are provided in Appendix B. Table 4-1 lists the

findings and recommendations detailed in each of these completed questionnaires. Highlights of the interview responses are summarized in the following sections.

Keyport Project Team: Interview questions were sent to EPA, Ecology, and the Suquamish Tribe. A total of three (3) completed questionnaires were received from the EPA Project Manager, the Ecology Project Manager, and the Suquamish Tribe Project Manager.

The EPA Project Manager indicated that he is very familiar with the OU 1 and OU 2 RODs and has been involved with the OUs to conduct regulatory oversight. He noted that the phytoremediation remedy for OU 1 has been ineffective. The removal of PCB-contaminated sediments has been helpful but additional work is needed based on the latest monitoring data. Work on the supplemental RI for OU 1 is progressing well. Although a quicker pace is always the goal, the project is taking a thorough and deliberate approach to completely investigate the area to ensure a protective remedy is selected and implemented.

For OU 2, ICs and monitoring are satisfactory in OU 2, and the excavation of soils at Area 8 was beneficial. However, the Area 8 remedy is not achieving RAOs, and a supplemental RI is underway. Two (2) abandoned drums were discovered at Area 2 and are currently being investigated as well.

He indicated that the monitoring data and reports at OU 1 and OU 2 have been of acceptable quality. He stated that the Navy has made significant progress on the recommendations from the fifth FYR. He also is well informed regarding all the investigations being conducted at OU 1 and OU 2. The Keyport Project Team holds regular meetings, and the Navy staff are excellent at maintaining open and honest communication with stakeholders. He noted that regarding per- and polyfluoroalkyl substances (PFAS), RIs will begin soon and will need to evaluate risks in the existing OUs. Although some investigation into 1,4-dioxane was completed during the last FYR period, additional work on that contaminant is also underway.

He was not aware of any complaints, violations, or other incidents requiring a response from his office and doesn't know of any community concerns other than the Suquamish Tribe's concern with the slow rate of progress.

The Ecology Project Manager indicated he is familiar with the OU 1 and OU 2 RODs and has been involved with them as regulatory oversight. He noted that the remedy for OU 1 has been ineffective, but the Keyport Project Team is actively working on gathering the information required to evaluate new remedies or modifications to the existing remedy. He also noted that the OU 2 remedies require further evaluation as data gaps have been identified and are being investigated. It was also pointed out that

while progress is being made, it has taken considerable time and resources to complete the investigations.

The Ecology Project Manager also indicated that PFAS are moving from a chemical of emerging concern to being regulated chemicals with established cleanup values at the state and federal level. This may lead to the determination that the remedies are not protective.

He was not aware of any complaints, violations, or other incidents requiring a response from his office and doesn't know of any community concerns.

The Suquamish Tribe Project Manager felt familiar with the remedies at OU 1 and OU 2. He feels that the OU 1 remedy has failed, and the Navy project team is working to address the issue. He feels that the OU 2 remedies are adequate.

The Suquamish Tribe is concerned with the pace of addressing the failed remedy at OU 1 as it affects Tribal Treaty rights. Though the current Navy team is proactively trying to address issues and has implemented improvements and additional site investigations at the site, the pace of government contracting mechanisms is hampering the speed at which work can be done. He feels that the Navy has done an exceptional job at communicating with the Suquamish Tribe.

Like Ecology and EPA, the Suquamish Tribe is also concerned about the effect PFAS has at the sites that may call into question the protectiveness of the remedy.

4.2 Data Review

This section presents a review and evaluation of the analytical data collected during this FYR period at OU 1, OU 2 Area 2, and OU 2 Area 8 of NBK Keyport. A summary of the investigations conducted and the data types collected is provided in Table 4-2.

4.2.1 OU 1

This section provides a review of the data generated during this FYR period pertinent to OU 1, including from the following programs:

1. Supplemental RI
2. USGS tidal lag study
3. LTM program
4. HVDPE Pilot Study

Additional data were collected in 2024 but were not presented in a final report in time to be included in this FYR (see Section 2.1.2). Key features of OU 1 referenced in this

section are shown on Figure 1-3. The data review occasionally refers to specific portions of OU 1 where specific investigations were conducted ("work areas"), and these areas are shown on Figure 4-1. Sample locations are shown on Figures 4-2 and 4-3, with a simplified figure showing primarily permanent monitoring well locations provided as Figure 4-4. Appendix C presents historical and cumulative LTM results at OU 1, including for groundwater, surface and seep water, and sediment. Appendix D presents data collected during supplemental investigations during this FYR reporting period, and these data are discussed in the subsections below.

4.2.1.1 Supplemental Remedial Investigation

As reported in the fifth FYR (Navy, 2020a) the Navy's 2012 evaluation of natural attenuation and intrinsic biodegradation at the landfill (Navy, 2012a) concluded that the RGs for discharge to surface water adjacent to the South Plantation would not be met within a reasonable restoration timeframe (i.e., 30 to 50 years). The evaluation recommended that an additional investigation of the South Plantation (Figures 1-3 and 4-1) be performed to identify COC hotspots. The evaluation also recommended an additional investigation in the central portion of the landfill due to increasing VOC trends in well MW1-17 (Figure 4-4).

In response to the recommendation for additional investigation the Navy initiated a site recharacterization program starting with a screening-level investigation to identify contaminant hotspots in soil and groundwater in the South Plantation and to identify possible source material in both the South Plantation and central portion of the landfill (Figure 4-1). These initial activities were conducted in August 2014 and a Phase I Site Recharacterization Report was completed in May 2015 (Navy, 2015b). This work was thoroughly discussed in the fifth FYR (Navy, 2020a). Also discussed in the fifth FYR was site recharacterization work performed as a follow-up to the Phase I study, with a thorough discussion of data finalized through June of 2019. Site recharacterization work remained in progress at the time of the fifth FYR review and the work in progress was summarized in that document. As site recharacterization progressed during this FYR period, the Navy concluded that the magnitude of the investigations warranted a supplemental RI report. This sixth FYR presents the finalized 2019 data as well as additional supplemental RI data collected throughout this FYR period in support of Volume 1 of the supplemental RI, which was finalized during this FYR period.

An HHRA/ERA field investigation report was also finalized during this FYR period and includes more than 300 pages of tabulated analytical data, along with supporting figures documenting sample locations. These data are being fully evaluated in the HHRA/ERA addendum report (Volume 2 of the supplemental RI) in progress at the time of this sixth FYR. Because of the volume of data, the data tables are not reproduced in this FYR

report, and the reader is referred to the HHRA/ERA field investigation report (Navy, 2024a) where the data are provided comprehensively.

At the time of this sixth FYR, Volume 1 of the supplemental RI report has been finalized and published (Navy, 2023a) and work towards Volumes 2 and 3 remains in progress. Each element of the supplemental RI, including the field activities and report components of each, are summarized in Tables 4-2a, 4-2b, and 4-2c. As each element of the supplemental RI is completed, the results will be documented in one (1) of the three (3) reports:

- Volume 1: Supplemental RI Site Recharacterization (Navy, 2023a)
- Volume 2: Supplemental RI HHRA/ERA Addendum (in progress)
- Volume 3: Supplemental RI Off-Site Groundwater Transport (in progress)

The overall objective of Volume 1 of the supplemental RI was to refine the CSM in support of potential remedy optimization to reduce the restoration timeframe. Given this objective, the refined CSM presented in Volume 1 of the supplemental RI constituted the detailed conclusions of the document. The remainder of this section summarizes the findings of the CSM presented in Volume 1 of the supplemental RI, with the supporting data provided in the subsections that follow.

The updated CSM depicts a hydrogeologic regime and cVOC and 1,4-dioxane plumes in groundwater that are different in important ways from the CSM that formed the basis for the selected remedy in the OU 1 ROD. Figures illustrating the revised understanding of key CSM elements were prepared as part of the supplemental RI and are reproduced in this FYR as Figures 4-5 through 4-8. The updated CSM calls into question the adequacy of the remedy in place and the supplemental RI concludes that an update of the existing remedy is warranted.

The hydrogeologic setting has been reinterpreted from a distinct contaminated “shallow aquifer” and relatively uncontaminated “intermediate aquifer” to a complex assemblage of paleochannels (Figure 4-6), with cVOC contamination extending to approximately 100 feet (ft) below ground surface (bgs). These paleochannels are now understood to extend beneath Dogfish Bay and likely provide preferential flow pathways for cVOC transport further beneath the bay than understood based on a simple saltwater wedge model (Figure 4-5). A second, higher concentration point of discharge from shallow South Plantation groundwater to adjacent wetland surface water is now known (Figure 4-7), and PCBs have been shown to remain within wetland sediment above the cleanup criteria in the area previously subject to remediation (Figure 4-8). Although conditions are favorable for biodegradation, these conditions do not support full reductive dechlorination to nontoxic end products but rather result in “dichloroethene (DCE) stall.”

Higher concentration source areas within the landfill are now identified, with the transport from these areas characterized, providing a focus for future FFS efforts.

The key observations of the Volume 1 supplemental RI are:

- The hydrogeologic regime is characterized by shallow Holocene-age tidal channel deposits that result in a complex assemblage of fine sands, silts, and clays that vary in their depth of occurrence over short distances between exploratory borings. These deposits are underlain by Olympia-age strata identifiable by a peat-rich silt and clay found overlain by a coarse sand/fine gravel. The Olympia-age strata exhibit a channelized surface that appears to provide preferential migration pathways for cVOCs along the regional groundwater flow direction to the northwest.
- The landfill waste body itself was placed in a tidal wetland atop the Holocene-age deposits, and the former wetland sediment layer is observable in many exploratory borings. The shallow depth to groundwater (as shallow as 2 ft bgs in some areas and seasons) and the elevated landfill waste body compared to the elevation of the adjacent remaining wetland results in local groundwater to surface transport of cVOCs from the waste body to the wetland. These shallow, local groundwater flows are driven by the hyper-local topography and thus can be to the south, southwest, west, or northwest, in contrast to the deeper northwesterly regional groundwater flow direction; in other words, the landfill creates localized radial flow of contaminated shallow groundwater.
- The paleochannel features appear to extend beyond the landfill footprint and beyond Navy property to the subsurface of Dogfish Bay, as evidenced by subsurface conductivity changes during tidal cycles mapped using geophysics.
- The cVOC plume in groundwater (as defined by exceedance of a regulatory standard by any of the cVOC COCs identified in the OU 1 ROD) is present beneath the majority of the landfill footprint, extending to a maximum depth of approximately 100 ft bgs. This plume originates primarily from three (3) identified higher concentration source areas within the landfill. However, based on the typical nature of ad-hoc landfill construction, the plume probably also emanates from a larger number of sources distributed throughout the footprint. cVOCs have sorbed to fine-grained soils throughout the plume area, and long-term, slow back-diffusion from these fine matrices will impact the efficacy of many potential remedial technologies.

- The biodegradation evaluation for cVOCs concluded that groundwater conditions generally appear adequate to support biodegradation, but are not sufficient to result in robust, complete dechlorination of the site. Prevalent accumulation of intermediate daughter products (i.e., cis-1,2-DCE and VC) and relatively low concentrations of the innocuous end products (e.g., ethene) represent incomplete reductive dechlorination and suggest that biogeochemical conditions in groundwater are not optimal for complete dechlorination of tetrachloroethene (PCE) and TCE to ethene. The accumulation of cis-1,2-DCE and VC at OU 1 suggests that the degradation progress remains in a long transitional DCE and VC stage (often referred to as “DCE stall”).
- The solvent-stabilizer compound 1,4-dioxane is present in the higher concentration area identified in the Central Landfill, and in the downgradient plume to the northwest, but is not found in the southern portion of the landfill. This may reflect the variation in material types disposed over time in different portions of the landfill. 1,4-Dioxane is found along with low concentrations of VC in wells located within the apparent preferential flow pathway offsite on the Highway 308 causeway. The presence of these more mobile compounds at this location may indicate that the Highway 308 causeway is near the leading edge of the plume.
- Elevated PCB concentrations appear to be widespread in soil within the landfill waste body from at least the middle of the North Plantation and northward. Although in general PCBs exhibit a low solubility and do not transport readily in groundwater, the 2019 data indicate that PCB transport in groundwater at this site may be an important mechanism, with oil-range petroleum serving to facilitate PCB transport both laterally and vertically. The detection of PCBs in wells installed in 2022 to investigate the vertical extent of COCs at the site may indicate downward transport of PCBs at greater depth and over a wider portion of OU 1 than previously understood. However, these results from the deeper wells may be misleading and may not represent actual PCB concentrations in the aquifer at the depths explored (Section 3.5.4). Seep water sampling results, and the results of ISM sampling of sediment in the reach of Marsh Creek downstream of the seep indicate that there is an ongoing contribution of PCBs to surface water from groundwater.

2019 Source Area Investigation. As summarized in the fifth FYR, an additional source area investigation was conducted at OU 1 in 2019, with the data ultimately incorporated into Volume 1 of the supplemental RI report discussed above (Navy, 2023a). The 2019 investigation was designed to collect quantitative data to:

1. Verify the migration path of VOCs and 1,4-dioxane from the Central Landfill hotspots toward wells on the Highway 308 causeway, located between the tide flats and Dogfish Bay;
2. Identify the source of PCB contamination in site sediments; and
3. Better define the extent of contamination:
    a. At the east side of the South Plantation;
    b. In the marsh area southeast of the South Plantation; and
    c. In Marsh Creek.

Lithologic data were also collected to improve mapping of the regional aquitard contact within the site boundary and to conduct fate and transport modeling.

The 2019 source investigation consisted of two (2) mobilizations:

<u>First Mobilization – June 2019 (Figures 4-2 and 4-3)</u>

- A total of 33 direct push borings were installed across the North Plantation, Central Landfill, and South Plantation; a total of 104 soil samples were collected; and a total of 67 grab groundwater samples were collected. All samples were analyzed for the target VOCs listed in the source investigation SAP (Navy, 2019c), consisting of the nine (9) cVOCs identified in the OU 1 ROD and chloroethane. Additional subsets of samples were analyzed for 1,4-dioxane, PCB Aroclors, TPH-diesel, and/or total organic carbon (TOC; soil only).
- A total of 16 porewater samples were collected from areas south of the South Plantation, downstream of Marsh Pond, and along Marsh Creek. The samples collected from south of the South Plantation and downstream of Marsh Pond were analyzed for the target VOCs, and the samples collected along Marsh Creek were analyzed for PCB congeners.
- A total of eight (8) surface water samples were collected. Five (5) surface water samples were collected from Marsh Pond and from surface water downstream of Marsh Pond and analyzed for target VOCs. Three (3) surface water samples were collected from areas near Seep SP1-1 and analyzed for PCB congeners.
- A total of seven (7) sediment samples were collected at, or in the vicinity of, historical sediment sample locations. These samples were analyzed for PCB congeners.

Second Mobilization – September/October 2019 (Figures 4-2 through 4-4)

- A total of 17 sonic borings were installed. A total of nine (9) monitoring wells were installed: three (3) in the South Plantation, one (1) in the Central Landfill, and five (5) in the North Plantation.
- A total of 27 soil samples were collected from the sonic boreholes. These samples were analyzed for the target VOCs, with additional subsets of samples analyzed for PCB congeners, TPH-diesel, and/or TOC.
- A total of 10 grab groundwater samples were collected from the sonic boreholes. These samples were analyzed for the target VOCs, with an additional subset of samples analyzed for 1,4-dioxane.
- A total of 34 groundwater samples were collected from the nine (9) newly installed monitoring wells and 20 pre-existing monitoring wells. All of these groundwater samples were analyzed for the target VOCs. Wells located in apparent hotspots that were expected to be the focus of potential future remedial action were additionally analyzed for microbial population, PFAS, PCBs, TPH-diesel, 1,4-dioxane, and biodegradation parameters (i.e., methane, ethane, nitrate, nitrite, sulfate, chloride, dissolved organic carbon, and sulfide).
- A total of three (3) porewater samples were collected in October 2019. These samples were collected from west/southwest of the South Plantation and were analyzed for the target VOCs.
- To update the CSM, the majority of the sonic borings were advanced to greater depths than in previous investigations. The soil cores were continuously logged from these locations to identify the upper contact of the regional aquitard within the site boundary.

The data collected from the 2019 source investigation were presented in Appendix B of Volume 1 of the supplemental RI report, and evaluations of the data were incorporated into the conclusions of that report (Navy, 2023a), as discussed above. Tabulated data from the 2019 source investigation are included in Appendix D.

Geophysical Investigation. In January 2021, a geophysical investigation of the wetlands adjacent to the landfill, the tide flats, and Dogfish Bay was performed. Temporal, intertidal electrical resistance tomography (ERT) was used to assess the freshwater saltwater interface, preferential flow pathways, and stratigraphy. The geophysical investigation consisted of:

- Collection of six (6) high-resolution, multi-electrode ERT traverses using either an Advanced Geosciences, Inc. (AGI) SuperSting R8 resistivity meter with an 84-electrode marine cable or a 56-electrode marine cable.
- Collection of four high-resolution, multi-electrode time-lapse electrical resistivity tomography (TRP) traverses using an AGI SuperSting R8 resistivity meter and a 56-electrode marine cable.

The geophysical investigation documented changes in relative resistivity in the subsurface over tidal cycles, corresponding to the flood and ebb tides. The changes in resistivity were mapped both in plan view and in cross section and provide a line of evidence that the channelized subsurface geology documented beneath the landfill footprint extends to the northwest beneath the tide flats and Dogfish Bay. The resistivity changes also imply that channelized freshwater, potentially transporting COCs, flows as far as Dogfish Bay during the ebb tide. An example of the transect results is provided as Figure 4-9, with the full report available as Appendix D of Volume 1 of the supplemental RI (Navy, 2023a).

Data collection in progress to support Volume 3 of the supplemental RI includes expansion of the geophysical investigation to cover more of Dogfish Bay to the west.

Upland Soil Investigation. In June 2021 direct-push soil core sampling to 6 feet bgs was performed at 29 locations north of the North Plantation on the landfill footprint to collect COI concentration data in support of the HHRA/ERA addendum which will be reported as Volume 2 of the supplemental RI. In advance of publication of Volume 2 of the supplemental RI, the shallow soil data collection activity, along with the analytical results, were summarized in a technical memorandum (Navy, 2023h).

Wetland Sampling. In June 2021 wetland sediment for PCBs was sampled using ISM across three (3) DUs in the reach of Marsh Creek from seep SP1-1 (Figure 4-8), which consistently demonstrates measurable PCB concentrations in seep water, to the culvert discharge of the creek to the tide flats. The results were used to develop a baseline 95 percent (%) upper confidence limit (UCL) of the arithmetic mean concentration for each DU in the reach of Marsh Creek downstream of seep SP1-1 and will be used for comparison to future results from each of these DUs, to establish temporal concentration trends, or concentrations before and after any future removal or remedial actions in this area. The results were presented in a final technical memorandum (Navy, 2022b).

The PCB evaluation concluded that total PCB concentrations in sediment in the distal reach of Marsh Creek at OU 1 exceed the marine sediment cleanup objective (SCO) of 12 milligrams per kilogram (mg/kg) organic carbon normalized (OC) in all three (3) DUs. Calculating the 95% UCL derives a PCB concentration for DU 1 sediment of 23.3 mg/kg

OC based on the Student's t statistic, using the Interstate Technology & Regulatory Council (ITRC) ISM Calculator (v.3.0, August 2020). Using the ITRC ISM Calculator to calculate the 95% UCL for DUs 2 and 3, respectively, derived concentrations of 54.6 mg/kg OC and 12.6 mg/kg OC, based on the Chebyshev statistic.

Vertical Extent Investigation and Slug Testing. The interim data deliverables provided to the Keyport Project Team based on the 2019 data described above demonstrated that the vertical extent of COCs had not yet been delimited. Also, the 2019 field investigation revealed geologic features that appeared to represent preferential flow pathways for COCs, with grain sizes that implied different hydraulic conductivities than those estimated for site soils during investigations in the 1990s. As a result of these observations, additional investigation was conducted between April and July 2022 to address these two (2) data gaps:

1. Vertical extent of contaminants
2. Hydraulic conductivity of geologic formations identified in 2019.

Seven (7) additional wells were installed using sonic drilling methods (Figure 4-4), with well bores drilled as deep as 100 ft bgs to confirm the expected geology, allow for screening of continuous soil cores, and select optimal well screen intervals. Well screens were installed either to document COC concentrations in coarse-grained soils immediately above the regional aquitard, or to document the expected absence of COCs in coarse-grained soils within the otherwise low-permeability aquitard formation. Relatively undisturbed soil samples were collected from targeted geologic units for laboratory characterization of physical soil properties, and slug tests were performed in 15 wells representative of the key geologic units.

The deepest documented concentrations of cVOCs in soil and groundwater samples implied that the vertical extent of cVOCs had been documented (Figures 4-10 through 4-16). Furthermore, based on depths and locations of new and existing data, and key assumptions, the lateral extent of contamination at depth was concluded to have been defined. The hydraulic conductivity values across the site, as calculated by the laboratory soil samples and as calculated by slug testing, correspond to expected values from hydrogeology literature for the respective lithology types within the screened well intervals (i.e., silty sand, clean sand and gravel, etc.). This comparison is tabulated in Appendix D.

Numeric Groundwater Modeling. A planning-level source and plume remediation model, REMChlor-MD, was used to assess the potential long-term, plume-wide effects of targeted remediation of high-concentration residual source areas at OU 1 (GSI, 2023). The full modeling report was provided as an attachment to the Volume 1 supplemental RI. The modeling showed that the target cVOCs are likely to persist for

many decades in the eastern portion of the South Plantation, and many centuries in the western portion of the South Plantation and in the Central Landfill. The modeling also indicated that the 1,4-dioxane plume is likely to persist for decades in the Central Landfill.

Environmental Sequence Stratigraphy (ESS). ESS was conducted as part of the supplemental RI. Historical regional and site-specific literature, historical boring and well logs, and site contaminant data were utilized with principals of sequence stratigraphy and sedimentary facies models to characterize the geology, hydrogeology, and contaminant fate and transport at OU 1. The results of the ESS characterization at OU 1 were used to support the updated CSM, which constituted the fundamental conclusions of Volume 1 of the supplemental RI. Four hydrostratigraphic units (HSUs), as defined by Schultz et al. (2017), were selected based on site and regional stratigraphy and validated based on site contaminant and groundwater elevation data. An example of a geologic cross section produced using ESS is provided as Figure 4-17, with the full suite of figures available as Appendix C of Volume 1 of the supplemental RI (Navy, 2023a).

Biodegradation. Sample results generated in 2017 and 2019 as well as historical data from a USGS report (USGS, 2015) were evaluated as part of the supplemental RI to assess the biodegradation conditions beneath the landfill footprint at OU 1. Data are included in Appendix D.

Groundwater analytical data utilized in the biodegradation evaluation included cVOCs, nitrate, nitrite, sulfate, sulfite, biological oxygen demand (BOD), chemical oxygen demand (COD), dissolved oxygen (DO), ferrous iron (iron II), oxidation/reduction potential (ORP), pH, conductivity, temperature, turbidity, dissolved organic carbon (DOC), methane, ethane, ethene, chloride, and microbial deoxyribonucleic acid (DNA).

The biodegradation evaluation for cVOCs concluded that groundwater conditions at OU 1 generally appear adequate to support biodegradation, but are not sufficient to result in robust, complete dechlorination of the site. Prevalent accumulation of intermediate daughter products (i.e., cis-1,2-DCE and VC) and relatively low concentrations of the innocuous end products (e.g., ethene) represent incomplete reductive dechlorination and suggest that biogeochemical conditions in groundwater are not optimal for complete dechlorination of PCE and TCE to ethene.

Volumes 2 and 3 Work in Progress. Data collection and evaluation to complete Volumes 2 and 3 of the supplemental RI will be documented in two (2) pending reports:

- Volume 2: Supplemental RI HHRA/ERA Addendum by AECOM
- Volume 3: Supplemental RI Off-Site Groundwater Transport by AECOM

As described above, the Volume 1 report was finalized in August 2023 (Navy, 2023a). The Volume 2 report is currently in process and is based on data collected in 2021 and published in an HHRA/ERA field investigation report (Navy, 2024a). The field data collection related to off-site transport to be reported under Volume 3 was underway in 2024, consisting of additional subaqueous geophysics and groundwater monitoring well installation.

The data presented in the HHRA/ERA field investigation report (Navy, 2024a) were used to prepare a HHRA/ERA addendum addressing the question: Are site contaminants present in OU 1 media at concentrations that pose potential unacceptable current or future risk to exposed human or ecological receptors? The HHRA/ERA addendum was in draft form and being reviewed by the Keyport Project Team at the time of this sixth FYR.

Risk assessment data from 2021 sample collection published in a final HHRA/ERA field investigation report dated May 2024 (Navy, 2024a) included:

- Data collection from seven (7) of 10 exposure areas defined in the Risk Assessment SAP (Figure 4-18, unacceptable risks to human health are already documented for the remaining three [3] exposure areas).
- Sampling of soil and plant tissue in terrestrial areas, and sampling of surface water, sediment, shellfish tissue, and plant tissue in aquatic areas and reference areas.
- Laboratory analysis of soil samples for PCB Aroclors; PCB congeners; metals (including hexavalent chromium [Cr(VI)]); polycyclic aromatic hydrocarbons (PAHs); cVOCs; PFAS; dioxins/furans; benzene, toluene, ethylbenzene, and xylenes (BTEX); TPH; TPH-gasoline range; TPH-diesel range; total solids; and TOC.
- Laboratory analysis of sediment samples for PCB Aroclors, PCB congeners, metals (including Cr(VI)), PAHs, cVOCs, PFAS, dioxins/furans, BTEX, ammonia, total solids, TOC, grain size or particle size, and sulfides.
- Laboratory analysis of surface water samples for PCB Aroclors, PCB congeners, dissolved metals, PAHs, cVOCs, PFAS, dioxins/furans, BTEX, ammonia, DOC, and sulfides.
- Laboratory analysis of shellfish tissue samples for PCB congeners, metals (including speciated arsenic and methyl mercury), PAHs, dioxins/furans, lipids, and percent moisture.

- Laboratory analysis of plant tissue samples for PCB congeners, metals (including speciated arsenic), PAHs, cVOCs, dioxins/furans, lipids, and percent moisture.
- Field measurement of surface water for conductivity, pH, temperature, DO, and ORP.

These data were focused on assessing the risk via the following pathways:

- Surface soil (0 to 2 feet bgs; human and ecological receptors) and subsurface soil (2 to 6 feet bgs; ecological receptors only) in Exposure Areas 1b and 2
- Plant/berry tissue and co-located substrate (soil and/or sediment) in Exposure Areas 1b, 2, 6, 7, 8, and 9
- Shellfish tissue and co-located sediment in Exposure Areas 5, 6, 7, and 8
- Sediment and surface water in Exposure Areas 5, 6, 7, 8, and 9

The HHRA/ERA addendum specifically did not re-evaluate the risk to human health of site groundwater used as drinking water. The OU 1 ROD concluded that the groundwater at the site is impacted above risk-based levels and ICs are in place to prevent the use of groundwater at OU 1 for drinking water. As a result, the data collected in support of the HHRA/ERA addendum do not provide additional insight into the nature and extent of cVOCs in groundwater beneath OU 1 beyond that presented in Volume 1 of the supplemental RI (Navy, 2023a). The data collected in support of the HHRA/ERA addendum were largely collected at different locations and from different media than those presented in Volume 1 of the supplemental RI. A small subset of the surface water and sediment samples collected during the HHRA/ERA addendum were collected from stations sampled historically, including during sampling in support of the supplemental RI. However, this additional data set does not alter the conclusions presented in Volume 1 of the supplemental RI. The data collected during the HHRA/ERA addendum should be integrated with the data presented in Volume 1 of the supplemental RI and data collected in support of the pending Volume 3 of the supplemental RI to prepare an update to the CSM presented as Section 3.1 of the Volume 1 supplemental RI (Navy, 2023a).

The HHRA/ERA field investigation report includes more than 300 pages of tabulated analytical data, along with supporting figures documenting sample locations. These data are being fully evaluated in the HHRA/ERA addendum report (Volume 2 of the supplemental RI) in progress at the time of this sixth FYR. The data tables are not reproduced in this FYR report, and the reader is referred to the HHRA/ERA field investigation report (Navy, 2024a) where the data are provided comprehensively.

4.2.1.2 USGS Tidal Lag Study

In 2018, the USGS conducted a tidal lag study to: 1) better understand nearshore groundwater-seawater interactions; 2) determine the optimal schedule/timing for groundwater sampling at different wells; and 3) inform a concurrent groundwater modeling effort at OU 1. To meet these objectives, water levels were continuously monitored in 19 existing groundwater monitoring wells and five (5) surface-water features of interest from July 12, 2018 to August 8, 2018, a period that included neap and higher amplitude spring tides. The results of this study were described in detail in the fifth FYR. During the initial study the pressure transducer in one (1) well failed to log data; therefore, at the time of publication of the fifth FYR, the USGS was supplementing the data collection with the intent that the sample timing recommendations would be updated based on the revised results.

USGS performed a redeployment in 2019 of data loggers in near-shore monitoring wells to record the specific conductance parameter that was not recorded during the first field effort in summer 2018. Results from the 2019 deployment provided no additional information to discount discrete data collected in 2018 and data from prior studies for determining the optimal sampling point and timing. Therefore, a revision of the 2019 OU 1 report (USGS, 2019) was not issued (personal correspondence, 2024).

4.2.1.3 Long-Term Monitoring Program

Because of the ongoing supplemental RI, LTM for OU 1 was postponed in 2018 until site recharacterization activities have been completed and the LTM monitoring well/location network can be re-evaluated to best reflect the revised CSM. This pause in LTM activities is by consensus between the Navy, Ecology, EPA, and the Suquamish Tribe. The cumulative LTM data at OU 1 are included in Appendix C and were reproduced from the fifth FYR with the addition of any supplemental data collected from historical LTM monitoring wells. Additional data collected from wells not historically part of the LTM program are included in Appendix D. For many CERCLA sites with a lengthy LTM history, it is useful to graph COC concentration data from LTM wells to help illustrate concentration trends over time. For NBK Keyport, graphing of the historical data from OU 1 is misleading because the wells historically monitored under LTM turned out to not be representative of the site, and there is not yet a sufficiently large data set from the new wells to create meaningful graphs. Similarly, many additional wells have recently been installed at Area 2 and Area 8 and are likely to result in revised CSMs. So, for these sites as well, graphs for wells with sufficient data may be misleading and are not included in this FYR.

Within the timeframe of the supplemental RI, various samples were collected under the Navy's LTM program by Sealaska (prior to 2020) and EA Engineering, Science, and

Technology, Inc. (EA; 2020 to present) to supplement RI data collection. These include groundwater samples for PCBs and PFAS, and post-HVDPE groundwater and surface water sampling.

The suspension of LTM activities has included the suspension of sampling under the CRA Plan (Navy, 2012c) as noted above. This suspension has been in effect for 7 years, although the Navy has continued to utilize the LTM/CRA program to collect supplemental data focused on supporting the supplemental RI process and the 2019 sampling event was substantially equivalent to the historical LTM/CRA program events. The LTM program and monitoring under the CRA Plan are key elements of the remedy under the OU 1 ROD. In addition, future evaluation of an optimized remedy will benefit from a robust data set consisting of analytical results generated over time from historical and new monitoring locations. Recognizing these needs and objectives, the Navy performed comprehensive sampling at OU 1 in 2024, with the data to be finalized after this FYR period.

Completion of Volumes 2 and 3 of the supplemental RI is unlikely to significantly alter an LTM/CRA Plan adopted in the near term. Therefore, this FYR recommends (Table 6-2) beginning development of a revised LTM/CRA Plan concurrent with finalization of Volumes 2 and 3 of the supplemental RI, and modifying that plan based on any final results from those volumes. Beginning development of an LTM/CRA Plan in the near term will allow prompt implementation of monitoring once all relevant information is available. As a FFS and ROD amendment are completed, additional adjustments to the LTM plan are likely, along with the addition of remedy performance monitoring. A ROD amendment should also consider removing or modifying the requirement of CRA-specific monitoring because the extensive additional site characterization has substantially improved the understanding of COC fate and transport and because the ROD amendment itself will constitute implementation of a contingent remedial action.

Beyond developing a robust data set from newly installed wells throughout OU 1, on-going LTM monitoring should consider regularly sampling:

- Groundwater in shallow monitoring wells at the southern, western, and northwestern edges of the landfill footprint to assess trends in COC concentration along a shallow groundwater to surface water pathway
- Groundwater in deep monitoring wells at the northwestern edge of the landfill footprint, at the base boundary, and on the Highway 308 causeway to assess trends in COC concentration along a deep regional groundwater flow pathway
- Groundwater in deep monitoring wells throughout the landfill footprint to assess trends in COC concentration along a potential downward transport pathway

- Surface water at stations along the southern boundary of the landfill and at regular intervals along the surface water flow pathway up to the tide gate to assess trends in COC concentration
- Sediment in decision units previously established at and downstream of Seep SP1-1 to establish trends and allow assessment of sediment recontamination from PCBs in seep water

December 2021 Groundwater Sampling Event. Based on the PFAS preliminary assessment (PA; Navy, 2020e) recommendation to move the investigation of PFAS directly to the RI and detection of PFAS in previous samples collected from the site, additional sampling at OU 1 was needed to delineate PFAS concentrations in groundwater across the site. This data gap was addressed by groundwater sampling at the monitoring wells and piezometers associated with the site. The December 2021 sampling event included the following scope of work:

- Collect water level measurements
- Collect field parameter measurements, including salinity
- Sample groundwater at 54 groundwater monitoring wells and five (5) piezometers associated with OU 1, with analysis for PFAS compounds.

The concentrations of PFAS compounds measured in the groundwater samples were compared to the PALs established in the 2021 groundwater sampling SAP (Navy, 2021d) prior to sampling, as well as the regional screening levels (RSLs) established in 2022 after the sampling was complete. The concentrations of perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) in the sample from well MW1-06 exceeded the PALs from the SAP (at 0.040 µg/L for each), with estimated concentrations of 0.16 µg/L and 0.12 µg/L, respectively. There were no other exceedances for PFOA or PFOS. There were no exceedances in groundwater of the PAL for perfluorobutanesulfonic acid (PFBS).

When compared to the 2022 RSLs, the following exceedances of the RSLs were identified:

- PFOS in the samples from wells 1MW-1, MW1-05, MW1-06, MW1-14, MW1-15, MW1-17, MW1-41, MW1-42, MW1-47, MW1-48, MW1-56 CH1, MW1-56 CH2, MW1-58 CH1, MW1-58 CH2, MW1-61, MW1-67, and P1-3.
- PFOA in the samples from wells 1MW-1, MW1-02, MW1-06, MW1-14, MW1-15, MW1-17, MW1-41, MW1-42, MW1-47, MW1-48, MW1-58 CH1, MW1-61, MW1-63, MW1-64, MW1-67, P1-1, P1-2, and P1-3.
- Hexafluoropropylene oxide dimer acid in the sample from well MW1-58 CH1.

- Perfluorohexanesulfonic acid in the sample from well MW1-06.

The EPA RSLs for these specific PFAS have changed since 2022, and PFAS-specific guidance and SLs for certain DoD assessments has been updated for a total of 11 different PFAS (DoD, 2025). These 2025 SLs have not been retroactively applied to existing reports or ongoing investigations at the time of the FYR. These analytical results will be incorporated into a RI for PFAS at the site, which will be performed separately from the supplemental RI for legacy COCs included in the OU 1 ROD.

Groundwater levels were measured in the 54 wells sampled during this event, with measurements collected over three (3) days at various tide stages. Because the data were collected over a relatively long timespan, the 2021 groundwater monitoring report (Navy, 2023c) concluded that the data could not be used to generate a groundwater elevation contour map. These data were assessed during this sixth FYR. This assessment determined that there are two (2) factors that need to be considered when collecting groundwater elevations at OU 1: the tidal cycle, as mentioned in the 2021 groundwater monitoring report, and the HSUs that the wells are screened in, as described in the ESS study completed as part of the Supplemental RI and Site Characterization (Navy, 2023a).

To address the effect of the tidal cycle on groundwater elevations and gradient, two (2) factors should be considered. First, as stated in the 2021 groundwater monitoring report, an effort should be made to measure wells during the shortest period possible during future groundwater level measurements. Second, a USGS study on the groundwater response to tidal fluctuations at OU 1 (USGS, 2019) provided recommendations for optimal sampling depths and times for monitoring wells that are influenced by tides. Regarding optimal sampling depths, groundwater chemistry samples collected from the middle of the well screens at OU 1 wells can remain the standard practice at each location given that no tidal-induced changes in the subtle freshwater/seawater interface have yet been identified in the screened interval of the wells. The optimal time to sample the monitoring wells influenced by tides would be to add the tidal lags in Table 6 of the USGS report (USGS, 2019) to the time of the predicted low-low tide for Poulsbo, Washington (NOAA Station 9445719).

As presented in the ESS study in Volume 1 of the supplemental RI (Navy, 2023a) and Site Characterization report (Navy, 2018b), shallower aquifer zones and the deeper coarse-grained zones of the upper portion of the Olympia formation are not hydraulically connected, and flow characteristics are different for the two (2) zones. Therefore, when constructing groundwater elevation contour maps at OU 1, groundwater elevations from wells screened above the Olympia contact should be evaluated and contoured separately from wells screened below the Olympia contact.

Supplemental Groundwater Sampling and ISM Sediment Sampling. Between August 2022 and September 2023 supplemental sampling activities were performed under the Navy's LTM program by EA (Navy, 2024b).

These supplemental sampling activities were focused on three (3) specific areas and actions at OU 1 (Figure 4-1):

- HVDPE pilot testing in the South Plantation
- PCB concentrations in sediment at and downstream of Seep SP1-1 near the North Plantation
- COC concentrations in the Highway 308 causeway wells

The objective of the supplemental sampling associated with the HVDPE pilot testing was to provide post-test cVOC concentrations in groundwater to allow evaluation of the long-term effectiveness of HVDPE. Water samples were collected and analyzed for cVOCs from 24 groundwater monitoring wells, 10 porewater stations, and six (6) surface water stations at timeframes of 1 month, 3 months, and 6 months following cessation of HVDPE pilot testing. The results are compared over time and compared to pre-HVDPE cVOC concentrations in the HVDPE Pilot Study subsection below.

ISM of sediment in the vicinity of Seep SP1-1 was performed in September 2023 as a follow up to initial ISM in this area in June 2021 (see above). This follow-up sampling refined the June 2021 sampling approach by adding additional DUs and subdividing the June 2021 DUs (Figure 4-19). The overall objective of the ISM in this area is to improve the understanding of PCB transport in Marsh Creek and provide a baseline from which to assess potential ongoing recontamination of this area over time. PCBs were believed to have been removed from this reach of Marsh Creek as one (1) element of the original remedy. The analytical results from the June 2021 and September 2023 events (Appendix D) indicate that PCB contamination from SP1-1 has an initial deposition to sediment in DU 1, and PCBs that remain suspended or are resuspended tend to travel downstream in the surface water. The results from the two (2) events are in general agreement that there are PAL exceedances in DU 1, DU 1A, DU 2, and DU 2A. The results from the September 2023 event demonstrate a PAL exceedance at DU 3B, which was not indicated in the June 2021 event at DU 3. Current PCB contamination at this location may be the result of suspended/resuspended PCBs impacting sediment in this location and/or possible surface water runoff from nearby upland soils that was not evident in June 2021.

Four groundwater monitoring wells located on the Highway 308 causeway (MW1-38, -39, -74, -75, Figures 4-3 and 4-4) were sampled in April 2023 to support planning of additional RI sampling under Volume 3 of the supplemental RI report. Samples were

analyzed for cVOCs, 1,4-dioxane, PFAS, PAHs, metals, and PCB Aroclors (Appendix D). The only cVOC detected in any of the four samples was VC in the sample from well MW1-39 at a concentration of 0.052 µg/L. 1,4-Dioxane and PCB Aroclors were not detected in any of the four samples. Because PCB congeners were not analyzed, these data do not provide any new insights regarding the unexpected occurrence of PCBs in deep monitoring wells installed in 2022 (Navy, 2023a). The Navy plans to perform additional sampling to help assess the PCBs detected in deep monitoring wells.

Various PFAS compounds were detected, but none at concentrations above the PALs established for the sampling event. The 2022 EPA RSL for tap water (target hazard quotient of 0.1), which is based on the protection of human health via drinking water only, was used as the PFAS PAL. The carcinogenic PAH total toxic equivalency (TEQ) exceeded the PAL of 0.000016 µg/L for the samples from MW1-39 and MW1-74 at 0.0012 and 0.019 µg/L, respectively. Cadmium and manganese were the only total metals detected in samples above established PALs. Cadmium was detected at a concentration of 1.7 µg/L in the sample from MW1-39, exceeding the PAL of 0.72 µg/L. Manganese was detected in samples from MW1-38 and MW1-17 at concentrations of 58 and 840 µg/L, respectively, exceeding the PAL of 50 µg/L.

4.2.1.4 HVDPE Pilot Study

An HVDPE pilot study was conducted between April and June 2022. To conduct the pilot study, two (2) shallow extraction wells (MW1-76 and MW1-77) were installed, along with one (1) air sparge point (AS1-1). Additionally, one (1) existing monitoring well was used as an extraction well (MW1-66), and several existing monitoring wells and surface water gauging stations were used as monitoring points during the pilot study. The aforementioned well locations and monitoring points are shown on Figure 4-20.

The objective of the HVDPE pilot study was to assess HVDPE, both alone and in combination with air sparging, as a potential technology for inclusion in the planned OU 1 FFS. The pilot study also generated data that can be used in the planned FFS to evaluate a range of technologies. These data include information regarding:

- Radius of influence and drawdowns achieved
- Aquifer characteristics
- COC concentrations in extracted groundwater and vapor
- Groundwater and vapor extraction flow rates
- Carbon usage rates

Overall, 1 to 3 feet of groundwater drawdown was observed in wells across the highest concentration plume area during the pilot test. The drawdown observed in MW1-68, installed within 10 feet of extraction well MW1-66 but beneath a 16-foot-thick clay, indicates that water-bearing zones that appear discrete during drilling are likely hydraulically connected in many cases, and the study recommended that any future remedial actions should account for complex migration pathways through the braided paleochannel system identified beneath the site.

For the South Plantation area, even the high vacuums and air flow rates applied were not sufficient to dewater the extraction wells without downhole pumps in place. Even with pumping, the water table was only lowered 1 to 3 ft across the area of interest, which was not sufficient to expose the most highly contaminated portions of the aquifer to vapor extraction. The pilot study recommended that any full-scale remedial technology that includes vapor extraction should be designed to also extract substantial volumes of groundwater to achieve the necessary drawdown. The study provided a working estimate of nine to 15 extraction wells that might be required for sufficient dewatering across the South Plantation, extracting water at 7 gallons per minute (gpm) per extraction well, or approximately 60 to 100 gpm total.

Air sparging was found to increase subsurface pressures substantially over a wide area, with air movement through preferential pathways. These effects would need to be accounted for in the design of any future remedial technology that includes sparging.

VOC concentrations in the combined vapor stream and in the individual extraction wells exhibited very similar trends over time, with and without air sparging, indicating that recoverable VOC mass is available throughout the South Plantation.

The estimates of mass removal during the pilot test and regression analysis forecasting implied that if the system continued to operate for the next year as it did during the three (3)-month test, as much as three (3) times the mass removal (a total of 600 kilograms [kg]) might be achieved. However, an alternative forecasting methodology implies that as little as an additional 60 kg of total VOC mass would be removed during continued operation, with a rapid decline in removal rate after approximately an additional two (2) to five (5) months of operation. The forecast estimated that use of air sparging would result in as much as twice the mass removal during a one-year operational period compared to HVDPE without air sparging. The forecast methods showed a one-order-of-magnitude uncertainty in the potential future mass removal estimate. This wide range of values conveys the uncertainty in the forecast.

The data obtained during the pilot study can also be used to inform evaluation of other remedial technologies that include groundwater extraction, vapor extraction, or air injection. The study estimated that pumping for hydraulic control (e.g., behind a sealed

containment wall) could be expected to generate water at approximately 10 gpm. Pumping at this rate could also be performed as part of a traditional pump and treat system. A pump and treat system at this site would rely on mass removal at the desorption rate of cVOCs from soil into groundwater and would likely require decades to achieve meaningful reductions in cVOC concentrations in groundwater, based on the CSM for the site and the steady cVOC concentrations observed in extracted groundwater during this pilot study.

Following the HVDPE pilot study, groundwater, surface water, and porewater samples were collected at 1-month, 3-month, and 6-month periods following HVDPE system shutdown (Table 4-3). The purpose of collecting these samples was to document the reduction in cVOC concentrations that resulted from the HVDPE pilot study, and any potential rebound observed as a dynamic equilibrium is re-established in the subsurface. The data resulting from the post-study testing were presented in a Supplemental Sampling Report (Navy, 2024b), in which data assessment and evaluation yielded the following observations and conclusions:

- Comparing pre- and post-pilot test analytical results for cis-1,2-DCE, TCE, and VC indicated that, in most cases, the post-pilot test concentrations of these cVOCs were lower or similar to the pre-pilot test results, with few instances indicating post-pilot test concentrations were greater.
- To evaluate rebound and other potential trends, post-pilot test results collected at intervals of 1 month, 3 months, and 6 months post-system shutdown were compared to one another. Overall, no consistent pattern or trend was apparent for cVOC concentrations over time for any cVOC or media sampled. In some cases, concentrations increased between the 1-month and 6-month post-pilot test sampling events; in other cases concentrations remained similar or declined.
- Analytical results for the post-pilot test sampling indicate that concentrations of cVOCs for groundwater, porewater, and surface water are above PALs.
- Product was observed at MW1-77 during the 3-month and 6-month sampling events. *Note: product had not previously been observed in groundwater monitoring wells, only in soil cores, suggesting that the extraction system exposed the well screen allowing product sitting on top of the water table to infiltrate into this monitoring well.*

The findings and conclusions presented in the Supplemental Sampling Report (Navy, 2024b) were general in nature and did not make separate conclusions for groundwater, porewater, or surface water, in some instances lacked available pre-pilot test data, and did not quantify concentration reductions following the post-pilot test sampling program. For this FYR, Tables 2-4, 2-5, and 2-6 of the Supplemental Sampling Report (Navy,

2024b) are included in Appendix D. These tables were modified to show cis-1,2-DCE, TCE, and VC only, additional pre-test data from 2014 or 2017, overall concentration reductions of combined cis-1,2-DCE, TCE, and VC from pre-pilot test through 6-month post-pilot testing, and some general observations of patterns or trends for each individual sampling location. These modified tables are presented in Tables 4-3a, 4-3b, and 4-3c of this report.

Further analysis of the pre- and post-pilot test groundwater sampling data indicates that of the 17 monitoring wells with sufficient pre- and post-pilot test data, 10 showed overall concentration reductions of combined cis-1,2-DCE, TCE, and VC of greater than 50%, and four (4) showed overall concentration reductions between 21% and 50%. Three (3) showed concentration increases of cVOCs (i.e., cis-1,2-DCE, TCE, and VC) from pre-pilot test through the 6-month sampling event. Additionally, although pre-test data were not available from three (3) piezometers tested during the post-pilot test, an order-of-magnitude increase was observed at two (2) of these sampling locations (P1-7 and P1-10) from the 1-month to 6-month events, indicating significant rebound. The third piezometer tested post-pilot test (P1-6) showed an overall concentration reduction of 88% from the 1-month to 6-month event. Of the aforementioned groundwater sampling locations that showed increasing or decreasing cVOC concentrations, several different trends and patterns were observed throughout the sampling timeline, which included:

- Concentrations decreasing at the 1-month post-pilot test event, followed by relatively steady concentrations through the 6-month event.
- Concentrations decreasing at the 1-month or 3-month events, followed by increase in concentrations (i.e., rebound) at the 6-month event.
- Concentrations steadily decreasing through the 6-month event.
- Concentrations decreasing through the 3-month event, followed by significant increase to greater than pre-pilot test concentrations (i.e., rebound) at the 6-month event.
- Concentrations that began relatively low, followed by an order-of-magnitude increase at the 1-month event, followed by decline back to near pre-test concentrations.

The various trends and patterns observed illustrate the known heterogeneity in the subsurface, both in terms of soil lithology and contaminant distribution. Application of a high vacuum at two (2) extraction points within this heterogeneous environment, and air sparging at a single point, resulted in variable movement of COCs in response to the induced vacuum and pressure gradients, as demonstrated by the variable concentration changes in monitoring wells over time. Even though groundwater sampling indicated

some degree of rebound at several monitoring wells, overall concentration reductions remained significant (46% to 98%) in the majority of wells through the 6-month sampling event.

Further analysis of the pre- and post-pilot test porewater and surface water sampling data indicates that of the 15 porewater and surface water samples with sufficient pre- and post-pilot test data, 12 showed overall concentration reductions of combined cis-1,2-DCE, TCE, and VC of greater than 67%, two (2) porewater samples showed low concentrations (less than 1 μg/L) of cVOCs during the pre-pilot test and post-pilot test sampling, and one (1) surface water sample showed a decrease of cVOC concentrations through the 3-month sampling event, followed by an increase (i.e., rebound) to above pre-pilot test levels. This single instance of rebound was from a surface sampling location that was upstream from the nearest extraction well (MW1-76) and the other five (5) surface sampling locations.

Despite the fluctuations and movement of contaminant mass in groundwater, the results of the pre- and post-pilot test sampling of porewater and surface water indicates significant reductions in cVOC concentrations in these media, with slight rebound observed at each location.

4.2.2 OU 2 Area 2

This subsection provides a review of the data collected during the soil and groundwater supplemental investigation in 2022 and the groundwater sampling event conducted in 2023. These data were collected in lieu of ongoing LTM sampling and in satisfaction of the recommendations from the fifth FYR. Additional data were collected in 2024 but were not finalized in time to be included in this FYR (see Section 2.2.2). Figure 2-2 depicts the sampling locations at OU 2 Area 2. Appendix E presents historical groundwater monitoring results from OU 2 Area 2, including cVOCs (i.e., VC, TCE, and cis-1,2-DCE) in Table E-1 and 1,4-dioxane in Table E-2.

2022 Soil and Groundwater Supplemental Investigation. The purpose of the soil and groundwater supplemental investigation was to assess whether cVOCs in soil and groundwater extend beyond the existing monitoring well network and to establish current site conditions. TCE and VC were identified in the OU 2 ROD as the COCs in groundwater based on the 1993 baseline risk assessment; however, only VC remained above the RG at the time of the fifth FYR (Navy, 2020a).

Eleven soil borings were advanced at OU 2 Area 2. Soil samples were collected from three (3) depths at two (2) borings and five (5) depths at nine (9) borings. New groundwater monitoring wells were installed in each of the soil boring locations. Fifty-

one (51) soil samples and 11 groundwater samples were collected from the 11 soil borings/wells (Figure 2-2).

The results for the June/July 2022 soil sampling are provided in Appendix F. Analytical results were compared to the PALs. Soil boring numbers correspond with well numbers for newly installed wells (e.g., SB-10 is in the location of 2MW-10, SB-11 is in the location of 2MW-11, etc.). Exceedances of the PAL occurred for the following analytes:

- TCE exceeded the PAL of 0.00011 mg/kg in the samples from soil borings SB-13 (15 ft bgs) and SB-17 (10 ft bgs, 20 ft bgs). TCE was not detected in samples from other soil borings; however, the laboratory limit of detection (LOD) exceeded the PAL.
- VC exceeded the PAL of 0.0000062 mg/kg in the samples from soil borings SB-13 (15 ft bgs, 20 ft bgs), SB-14 (20 ft bgs), and SB-19 (15 ft bgs and 20 ft bgs). VC was not detected in samples from other soil borings; however, the laboratory LOD exceeded the PAL.
- cis-1,2-DCE exceeded the PAL of 0.0052 mg/kg in the samples from soil borings SB-13 (15 ft bgs) and SB-14 (15 ft bgs, 20 ft bgs). cis-1,2-DCE was not detected at concentrations above the PAL in the other samples; however, in two (2) instances the laboratory LOD exceeded the PAL when this analyte was not detected.
- The following analytes were not detected; however, the laboratory LODs exceeded PALs: 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane (1,1,2-TCA), 1,2,3-trichloropropane, 1,2,4-trichlorobenzene, 1,2-dichloropropane, carbon tetrachloride, cis-1,3-dichloropropene, hexachlorobutadiene, methylene chloride, and trans-1,3-dichloropropene.

The analytical results for the 2022 groundwater monitoring event are provided in Appendix F as well as summarized in Appendix E to compare with historical LTM data. Analytical results were compared to the PALs defined in the 2021 groundwater sampling SAP (Navy, 2021d). Exceedances of the PAL occurred for the following analytes:

- TCE exceeded the PAL of 0.30 µg/L in the samples from wells 2MW-11, 2MW-12, and 2MW-13 and exceeded the RG of 5.0 µg/L in one (1) well (2MW-12) with a concentration of 7.2 µg/L. TCE exceedances in 2022 groundwater samples are shown on Figure 4-21.
- VC exceeded the PAL of 0.029 µg/L in the samples from wells 2MW-11, 2MW-12, 2MW-13, 2MW-14, 2MW-19. VC exceedances in 2022 groundwater samples are shown on Figure 4-21.

- Chloroform exceeded the PAL of 1.4 µg/L in the sample from 2MW-14.
- The following analytes were not detected; however, the laboratory LODs exceeded PALs: 1,1,2,2-tetrachloroethane, 1,2,3-trichloropropane, 1,2,4-trichlorobenzene, and hexachlorobutadiene were not detected above the laboratory LOD.
- The following analytes were not detected in the sample from well 2MW-12; however, the laboratory LODs for this sample exceeded PALs: 1,1,2-TCA, 1,2-dichloroethane, 1,2-dichloropropane, carbon tetrachloride, cis-1,3-dichloropropene, methylene chloride, tetrachloroethene, and trans-1,3-dichloropropene.

Several soil and groundwater sample results were considered usable but qualified as estimated (with "J" or "UJ"). Notably, the detected cVOCs for soil samples from four borings (SB-11, SB-12, SB-17, and SB-18) may be biased low due to temperature above 20 degrees Celsius during shipment to the laboratory. Additionally, soil sample results for non-detect analytes were not considered usable because of the high temperature during shipping and were rejected (qualified as "R"). A total of 754 results were rejected during the data validation and assessment.

The soil and groundwater analytical results indicate that TCE and VC concentrations exist outside of the previously installed point of compliance groundwater monitoring wells (2MW-1, 2MW-6, and MW2-8). The report recommended that the newly installed monitoring wells (2MW-9 through 2MW-19) be added to the LTM network.

LTM Sampling. As described in Section 2.0 and the OU 2 ROD (Navy, EPA, and Ecology, 1994), the selected remedy for OU 2 Area 2 includes:

- MNA.
- LTM to establish trends in COC concentrations and determine when LUCs can be discontinued.
- LUCs to prevent residential land use and construction of domestic wells.

Per the OU 2 ROD, the COCs for OU 2 Area 2 are VC and TCE with RGs of 0.023 and 5 µg/L, respectively, both the MTCA B cleanup level. At the time of the OU 2 ROD, the RG for VC was below the practical quantitation limit (PQL) of standard EPA methods for drinking water. In such cases, the MTCA B cleanup level was based on the PQL (per Washington Administrative Code [WAC] 173-340-700[6]) and the expected PQL for VC was 0.1 µg/L. In 2012, the RG for VC was updated to 0.029 µg/L based on the calculated MTCA B cleanup level using the current oral slope factor. Using improved

analytical techniques, the PQL has been below this updated RG of 0.029 µg/L since June 2012.

During this FYR period, the LTM program at Area 2 involved periodic sampling of groundwater from three (3) point of compliance monitoring wells (i.e., 2MW-1, 2MW-6, and MW2-8) for vinyl chloride (VC), with comparison of results to the RG for VC. The LTM program also involved periodic water level measurements to monitor the groundwater flow direction. LTM sampling was conducted in 2023 and 2024; however, the 2024 report was not finalized within this FYR period. In 2020 sampling was not conducted due to contract changes from one LTM contractor to a different contractor. No sampling was conducted at the three (3) existing LTM wells in 2021 or 2022 due to the soil and groundwater supplemental investigation conducted in 2022.

The spring 2023 LTM sampling event included re-sampling new monitoring wells that were installed in 2022 to assess whether cVOCs in groundwater extend beyond the existing LTM well network and to establish current site conditions. Groundwater sampling was performed at three (3) OU 2 Area 2 wells historically sampled for the LTM program (2MW-1, 2MW-6, and MW2-8) and 11 wells installed in 2022 (2MW-9 through 2MW-19). Figure 2-2 shows the locations of the new and historical wells at OU 2 Area 2. Samples were collected and analyzed for cVOCs using EPA SW-846 Method 8260D using selected ion monitoring (SIM). The change in analytical approach from that indicated in the 2021 groundwater sampling SAP (Navy, 2021d) was made to achieve the required sensitivity for VC.

Of the 13 cVOCs reported from the spring 2023 sampling event, only TCE and VC were detected at OU 2 Area 2; cis-1,2-DCE was not reported during this sampling event, as it has been discontinued from monitoring in the LTM plan. Below is a summary of the TCE and VC results.

Based on the 2023 groundwater sample results, the monitoring report recommended that the results from at least four groundwater sampling events be available for each available well to allow the Keyport Project Team to determine which wells should be included in a revised LTM network. The OU 2 Area 2 wells were sampled again in 2024, representing the third sampling event using the expanded well network. The report presenting the 2024 groundwater sampling at OU 2 Area 2 has not been finalized by the deadline for this FYR; therefore, the results are not included in this document. Regardless of the number of monitoring events using the expanded well network, this FYR recommends (Table 6-1) additional investigation and well installation before a revised LTM program is established, as discussed below.

The OU 2 ROD expectation for Area 2 was that “Groundwater quality is expected to gradually improve by the action of natural processes such as aquifer flushing,

volatilization, and biodegradation." This phrase describes natural attenuation processes, and this has typically been captured in FYRs for the site as the OU 2 ROD established a requirement for MNA as a remedy component for Area 2. The additional investigation work in 2022, 2023, and 2024 included measuring biodegradation parameters in support of this requirement, with the most extensive suite of biodegradation parameters measured in 2024.

This FYR included a preliminary review of the draft 2024 biodegradation data, which are not yet finalized. The finalized data relative to biodegradation collected in 2022 and 2023 are summarized in the remainder of this paragraph. Overall, future full analysis of biodegradation is likely to conclude that limited evidence of biodegradation is present, with less than ideal conditions for reductive dichlorination. In 2022, DO ranged from 0.40 milligrams per liter (mg/L) to 0.76 mg/L for 10 of 11 wells, with a result of 4.60 mg/L at 2MW-19; in 2023 DO ranged from 0.99 mg/L to 1.65 mg/L for nine (9) of 11 wells, with a result of 3.33 mg/L at 2MW-1 and 4.78 mg/L at 2MW-8. In 2022 ORP ranged from -501.8 mV to 131.5 mV; in 2023 ORP ranged from -38.9 mV to 212.0 mV. In 2022, cis-1,2-DCE (a mid-range biodegradation product between TCE and VC) was detected in seven (7) of the 11 newly installed wells, with concentrations of 10 µg/L and 13 µg/L in wells 2MW-11 and 2MW-14, respectively. The results of 10 µg/L and 13 µg/L were higher than any cis-1,2-DCE result from OU 2 Area 2 LTM wells from 2002 through 2014, when cis-1,2-DCE was discontinued from the LTM program.

In contrast to the expected concentration reductions quoted above from the OU 2 ROD, the most recent groundwater concentration data collected from new wells installed at the site in 2022, nearly 30 years after ROD signature, show at least one (1) well (2MW-17) exhibiting a TCE concentration (120 µg/L) more than twice the maximum concentration known at the time of the OU 2 ROD (36 µg/L in 2MW-1). The furthest downgradient well that has exhibited any cVOC detections above the RGs in groundwater (VC at 2MW-14) is approximately 500 ft from the shallow lagoon to the northeast. Using the groundwater velocity recently estimated at OU 1 of 0.05 feet/day (as calculated from MW1-44, which was screened in silty sand comparable to the Area 2 lithology and was the lowest groundwater velocity value calculated via slug tests at OU 1), groundwater and contaminants would have reached the shallow lagoon many years ago, in the absence of sufficient attenuation.

Depth to groundwater data were collected from the 11 newly installed monitoring wells (2MW-9 through 2MW-19) and the historical monitoring wells (2MW-1, 2MW-6, and MW2-8) in 2022 (new wells only) and 2023 (all aforementioned wells); however, the data reports did not attempt to use these data to assess groundwater flow direction or gradient. Evaluation of these depth to groundwater data as part of this FYR leads to the conclusion that existing data sets cannot be used to construct a defensible groundwater

contour map, most likely because the data were collected across multiple days. Attempts to create reasonable contour maps using the 2022 and 2023 data sets required excluding certain wells or bending contour lines in ways that did not comport with standard hydrogeologic practice. In both 2022 and 2023, the groundwater elevation measured in 2MW-19 was an anomaly and showed groundwater elevations several feet lower than expected, which could be attributed to a Filterra stormwater system discharge and ephemeral stream in the vicinity of this well. This FYR recommends (Table 6-2) that roughly time-coincident depth to groundwater measurements be made from all available groundwater monitoring wells in the vicinity of Area 2 during both wet and dry seasons to update the understanding of groundwater flow. If pressure transducer data loggers are available, consideration should be given to collecting continuous groundwater elevation data for six (6) months to allow assessment of seasonal and potential tidal variations in groundwater flow direction and gradient. These data can then be used to optimize placement of monitoring wells that reliably meet the OU 2 ROD requirement for monitoring potential downgradient migration of COCs in groundwater.

Additional work is planned under the drum investigation SAP covering an investigation of partially buried drums observed at the site (Navy, 2024i). This additional investigation is expected to provide a path forward for completing a revised CSM for Area 2.

LTM Results – TCE. During this FYR period, groundwater samples were collected and analyzed for TCE from the 14 monitoring wells listed above in April (all wells sampled except 2MW-1) and June 2023 (well 2MW-1 sampled). Figure 4-22 presents a site map of OU 2 Area 2 that includes TCE results from 2023. As shown on Figure 4-22, TCE concentrations were above the RG of 5.0 µg/L in one (1) of the 14 wells sampled (2MW-17). TCE concentration in well 2MW-17 was 120 µg/L (estimated), which is higher than the highest TCE concentration in groundwater documented in the OU 2 ROD (36 µg/L in well 2MW-1). TCE was detected below the RG in 10 of the 14 wells (MW2-8, 2MW-1, 2MW-6, 2MW-11, 2MW-12, 2MW-13, 2MW-14, 2MW-16, 2MW-18, and 2MW-19) with concentrations ranging from 0.022 to 4.2 µg/L. Three (3) wells (2MW-9, 2MW-10, and 2MW-15) were non-detect for TCE.

Figure 4-22 shows the estimated extent of the TCE plume at OU 2 Area 2 based on the expanded investigation area. The illustrated plume delineates RG exceedances for TCE, not overall detections. In 2022 and 2023 concentrations of TCE at levels below the RG were detected in wells 2MW-6 and 2MW-14, which are located outside of the TCE plume boundary shown on Figure 4-22.

LTM Results – VC. During this FYR period, groundwater samples were collected and analyzed for VC from the 14 monitoring wells listed above in April/June 2023. Figure 4-22 presents a site map of OU 2 Area 2 that includes VC results from this FYR period.

As shown on Figure 4-22, VC concentrations were above the RG of 0.029 μg/L in five (5) of the 14 wells sampled (2MW-11, 2MW-12, 2MW-13, 2MW-14, and 2MW-17). Concentrations ranged from 0.029 to 3.0 μg/L (estimated) in these wells. VC was non-detect in eight (8) of the 14 wells (MW2-8, 2MW-1, 2MW-6, 2MW-9, 2MW-15, 2MW-16, 2MW-18, and 2MW-19). In well 2MW-10, VC concentration was detected below the RG at 0.014 µg/L.

Figure 4-22 shows the estimated extent of the VC plume at OU 2 Area 2 based on the expanded investigation area. Similar to the illustrated TCE plume extent boundary, it is likely the VC plume boundary is meant to delineate RG exceedances for VC, not overall detections, although in this case, there are no VC detections below the RG outside of the illustrated VC plume boundary.

During evaluation of the historical and recent data at the OU 2 Area 2 wells, it was observed that the newly installed wells 2MW-9 and 2MW-10 are screened significantly deeper (i.e., at least 13.9 feet deeper and as much as 21.2 feet deeper) than adjacent wells 2MW-6 and 2MW-14. The VC detection in 2MW-14 in 2023 (0.055 µg/L) was still above the RG (0.029 µg/L). Therefore, the estimated extent of the VC plume, as shown on Figure 4-22, is misleading without downgradient wells that are screened at similar depths to 2MW1-6 and 2MW-14. Additional downgradient wells should be installed, with their location and screened interval based on an updated CSM, to include groundwater contour maps that account for seasonal variations, as discussed above.

4.2.3 OU 2 Area 8

This section reviews the data generated during this FYR period pertinent to OU 2 Area 8, including from the:

1. 2023/2024 vapor intrusion sampling
2. Bench-scale study
3. Supplemental RI
4. 2024 seep sampling.

Figure 1-5 presents a site map of OU 2 Area 8.

4.2.3.1 2023/2024 Vapor Intrusion Sampling (Navy, 2024g)

Vapor intrusion sampling was conducted in August 2023 and January 2024 at OU 2 Area 8, in the same locations that were established in 2019. The overall objectives of the vapor intrusion sampling were to perform paired sub-slab vapor and indoor air monitoring as recommended for Buildings 82 and 98 to evaluate whether the vapor

intrusion pathway has become complete in these two (2) buildings since the 2018 vapor intrusion study and, if so, whether the completed pathway has the potential to pose a risk to human health.

Overall, the results of the NBK Area 8 vapor intrusion sampling performed in August 2023 and January 2024 indicate that the vapor intrusion pathway continues to not be an exposure pathway of concern because the contaminants that were detected in indoor air above PALs were shown to be the result of indoor background sources rather than vapor intrusion. However, because of the on-going presence of elevated sub-slab vapor concentrations beneath the buildings, continued annual foundation and building inspections along with indoor air monitoring every five (5) years in support of FYR reporting are recommended for Buildings 82 and 98. Statistical analysis of analytical data shows that the most conservative timing for vapor intrusion monitoring is winter. Details of the sampling events conducted during this FYR period are provided in the remaining paragraphs of this subsection.

Indoor air, outdoor air, and sub-slab vapor samples were collected in both summer (August 2023) and winter (January 2024) to account for the seasonal variability of vapor intrusion potential. During sample collection, the heating, ventilation, and air conditioning (HVAC systems), windows, and doors were operated normally for the season and time of day to represent typical conditions and typical building use by the occupants.

At Building 82 and Building 98 sub-slab vapor and indoor air sample locations selected during the 2019 vapor intrusion study were resampled for this follow-up sampling, and outdoor air sample locations were selected by the field team based on the observed wind direction. The position of each sample location was noted based on known landmarks within or near buildings.

Three (3) outdoor air samples, 22 indoor air samples, and 20 sub-slab vapor samples were collected in August 2023 and three (3) outdoor air samples, 22 indoor air samples, and 21 sub-slab vapor samples were collected in January 2024.

None of the outdoor air results exceeded indoor air PALs, but there were low level detections of some compounds in each outdoor air sample. PCE was detected in all of the outdoor air samples at estimated values and trans-1,2-DCE was detected in two (2) of the August 2023 outdoor air samples and all of the January 2024 outdoor air samples, with the highest detection in outdoor air of 4.2 microgram per cubic meter ($\mu g/m^3$).

Figures 4-23 and 4-24 show results of PCE, TCE, cis-1,2-DCE, trans-1,2-DCE, 1,1-DCE, and VC in indoor air and sub-slab samples collected from Buildings 82 and 98, respectively. The 2023 and 2024 results are compared to the results of the April and

July 2019 samples. In Building 82, TCE exceeded the PAL in five (5) sub-slab sample locations in both August 2023 and January 2024, with the exception of one (1) location (Area8-B82-SS-6) where the exceedance was only in the August 2023 sample. There were no PAL exceedances in any of the Building 82 indoor air samples. In Building 98, TCE concentrations exceeded PALs in eight (8) of the 12 sub-slab samples collected during one (1) or both of the 2023/2024 sampling events. PCE concentrations exceeded the PAL in one (1) of the sub-slab sample locations during both sampling events. All other VOCs were non-detect or detected at concentrations below their respective PAL. Trans-1,2-DCE exceeded its PAL in 11 of the 13 indoor air samples. With the exception of one (1) location (Area8-B98-IA-13) which was exceeded during both events, all indoor air exceedances were during the January 2024 sampling event only. The data from these sampling events are included in Appendix H.

4.2.3.2 Amendment Identification and Bench-Scale Study (Navy, 2024f)

A laboratory and bench-scale study were conducted to assess the potential effectiveness of funnel-and-gate PRB technology for an optimized remedial action at OU 2 Area 8. The study was intended to provide laboratory data for the preliminary evaluation of an innovative PRB delivery system using a treatment amendment identified during the study. These data are expected to be used to assess whether a PRB is feasible as a contingent remedial action that should be evaluated during the future FFS.

The overall problem statement was: Can media be identified that effectively stops the migration of metals contamination in saline groundwater and can the SubflowRx (a funnel and-gate type PRB where sheet piling [funnel] directs groundwater to gates that house replaceable cartridges containing candidate media and/or treatment amendments) be advanced as a feasible remedial action alternative, using this identified amendment, to stop risk-causing metal contaminants in OU 2 Area 8 groundwater from reaching the Area 8 beach, given the challenging site conditions, which include variable high salinity, tidal effects on groundwater flow direction, and the potential absence of an aquitard to vertically bound a PRB?

The first part of the study involved identifying one (1) or more amendments that can transform/precipitate ecological risk-causing metal contaminants (i.e., cadmium and chromium) in a simulated saline environment and be successfully integrated into a miniature CartridgeRx in a solid form with a specified hydraulic conductivity to form a treatment amendment for further study in an analog flow model (AFM) generally simulating the site environment. Removing cadmium and chromium from simulated saline water at a 90 percent or greater removal efficiency was set as a chemical boundary condition. Demonstrating that a treatment amendment had a hydraulic

conductivity between 3 and 5 centimeters per second was set as a physical boundary condition.

The second part of the study was a bench-scale experiment to answer the following questions:

- How do simulated tidal fluctuations impact the general flow dynamics of a SubflowRx?
- Can the treatment amendment(s) sequester COCs in a simulated non-marine environment without impacting the flow dynamics of the SubflowRx?
- Can the treatment amendment(s) sequester COCs in a simulated marine environment without impacting the flow dynamics of a SubflowRx?
- Can the treatment amendment(s) sequester COCs in a simulated non-marine environment without impacting the flow dynamics of a SubflowRx?
- Can the treatment amendment(s) sequester COCs in a simulated marine environment without impacting the flow dynamics of a SubflowRx?

Only two (2) of the five (5) experiments under Part 2 were performed in the study due to time constraints.

Of the 12 commercially available media tested, only three (3) candidate media were identified that would remove at least 90 percent of the COCs in simulated groundwater. These candidate media included two (2) ion exchange resins available from Headwater Technologies (i.e., HWR-200 and HWR-300) and a metal ion binding reagent blend available from Premier Magnesia (CR 20).

Laboratory column tests demonstrated that the HWR-200/HWR-300 media show a decrease in COC removal efficiency when the test solution is saline; the ion exchange resins were therefore not considered to be a viable alternative for the study. When subjected to the same column test conditions, CR 20 demonstrated a high and consistent COC removal efficiency. However, CR 20 is only available from the manufacturer in a powder form and did not meet the hydraulic conductivity requirements of the project even when mixed with inert materials such as sand (i.e., the CR 20 powder was found to settle out of the sand). Efforts were made to pelletize the CR 20 powder; however, although the permeability significantly increased, the resulting products no longer met the chemical boundary conditions. Products similar to CR 20 were identified and tested but eliminated since neither boundary condition could be met.

Between March and August of 2023, a total of 57 different candidate media were developed under an internal research and development (IR&D) project. None of these 57 candidate media met both boundary conditions and were therefore eliminated from

further consideration. Efforts continued from September through December 2023 to identify and test candidate media developed under the IR&D project. Although promising candidate media continued to be identified in this period, other technical challenges were also encountered (e.g., recognition of small COC-containing particles escaping from the media causing analytical interference and a high pH measured post treatment for some candidate media).

Additional testing in January 2024 identified two (2) primary candidate media referred to as “CM-20C” and “CM-22A.5.” These media consist of chemicals that react with the COCs and chemically compatible binders. These two (2) down-selected candidate media are both in the shape of small hemispheres developed by the Navy’s testing contractor at an optimal and consistent size and, when mixed with inert materials (i.e., a medium-grained sand), form the primary components of a treatment amendment identified for the study that meet both the chemical and physical boundaries. These media were ultimately found to be promising as treatment media for Area 8.

Tidal fluctuations representative of Area 8 were successfully simulated during AFM Experiment 1. It was demonstrated during five (5) consecutive tidal cycles that a simulated downgradient plume of contaminants was unable to reach the upper elevation screens of the miniature PileGate and that physical devices such as check valves for potentially reducing tidal backflow into the SubflowRx are unnecessary. However, as a contingency measure, devices have been identified that are designed to be used in conjunction with the SubflowRx.

AFM Experiment 3 successfully demonstrated that a source of COCs injected in a miniature well upgradient of the PileGate can be captured and treated in a miniature CartridgeRx containing a treatment amendment. The COC removal efficiencies were above the study objective of 90 percent for the 24-hour test period of AFM Experiment 3. Recommendations were made in the study report to address the effects of dilution of COCs in future bench-scale studies (Navy, 2024f).

Because of contractual timing limitations, the report of this bench-scale study was finalized without Keyport Project Team input. Input from the Keyport Project Team regarding this study will be incorporated into the upcoming FFS for Area 8.

4.2.3.3 Supplemental RI (pending report)

The supplemental RI included three (3) mobilizations between 2021 and 2024. A geophysical survey was conducted during the first mobilization to locate underground features such as utilities and to delineate saltwater intrusion below the surface. During mobilization 2 in 2023, direct push soil and groundwater sampling was conducted at 19 locations to fill in data gaps at OU 2 Area 8. The final mobilization conducted in late

2023 included drilling seven (7) deep borings and installing 27 monitoring wells. Tidal influence monitoring was conducted in early 2024 using transducers to record groundwater and tidal fluctuations across the site. Results and recommendations from the supplemental RI will be presented in the next FYR because the report has not been finalized as of the writing of this sixth FYR.

Although the objective of the supplemental RI was to refine the CSM in support of alternative selection to mitigate site contamination from seeping onto the adjacent beach, substantial additional data were generated for chemical concentrations in soil and groundwater in the terrestrial portions of the site. This FYR recommends (Table 6-1) that once these data are finalized an assessment is performed to conclude whether the remedy for the terrestrial portion of the site remains protective of human health and the environment.

4.2.3.4 2024 Seep Sampling (pending report)

At OU 2 Area 8, seep water samples have been historically collected from Seep A, Seep B, and Seep C, located along the shore of Port Orchard Bay (see Figure 2-3). This sampling has been conducted to determine if OU 2 Area 8 groundwater is adversely impacting the adjacent marine environment, as required by the OU 2 ROD. As a result of consistently low and stable VOC and dissolved metals concentrations, sampling at Seep B was discontinued in 2012, as recommended in the third FYR. Starting in September 2018, Seep C was sampled instead of Seep A under the LTM program. Seep C has historically shown higher VOC concentrations than Seep A. Therefore, the Navy determined that Seep C was more representative of worst-case conditions related to seepage of groundwater to surface water at OU 2 Area 8.

In 2024, one (1) seep sample (plus one [1] duplicate) was collected from Seep A. The samples were analyzed for total mercury, dissolved metals, and VOCs. This sample was collected in support of the supplemental RI and to ensure that periodic seep data were generated during the period when regular LTM was not being conducted.

4.2.3.5 Long-Term Monitoring Program

The LTM program for OU 2 Area 8 was put on hold in 2018 while additional investigations were conducted at the site. The LTM program includes groundwater, seep water, surface water, and sediment sampling, which have been conducted in accordance with the regulator-approved LTM Work Plans and presented and discussed in LTM Reports. Figure 2-3 depicts the historical LTM sampling locations at OU 2 Area 8. No LTM sampling was conducted during this FYR period. Historical LTM data are included in Appendix G. Unlike for OU 1, this FYR does not recommend restarting an OU 2 Area 8 LTM program in the near term. Design of a revised LTM program should

follow Keyport Project Team concurrence that the supplemental RI for OU 2 Area 8 is substantively complete.

4.3 Results of Site Inspections

The following subsections summarize the results of the annual LUC inspections and FYR site inspections at NBK Keyport.

4.3.1 Land Use Control Inspections

LUCs have been implemented at the various OUs at NBK Keyport to prevent exposures to contaminants and to limit or prohibit activities that may interfere with the integrity of a remedial action (Navy, 2020d). To document effectiveness of the LUCs, physical and records inspections within the LUC boundary are conducted on an annual basis. These inspections are guided by the inspection checklists provided in the IC Plans (Navy, 2020d). Table 4-4 presents a summary of the LUC inspection results from 2020 through 2024.

As shown in Table 4-4, there were no instances/findings of LUC deficiencies during this FYR period, demonstrating that LUCs have been adequately implemented. During this FYR period an office trailer was temporarily sited on the landfill without prior review by the Navy RPM. The issue was identified, reported to the regulatory agencies, and any potential health issues associated with the trailer were evaluated/reviewed. Limited duration occupancy of the trailer was approved; however, the trailer was subsequently moved off the landfill. In this case, the LUC permitting processes did not proactively prevent siting the office trailer on the landfill, but the corrective action process functioned as intended. The corrective action consisted of clarifying the permitting workflow with the current permitting staff. No other issues occurred during this FYR period.

The LUCs are preventing exposure to residual contamination along the pathways identified in the OU 1 ROD and have controlled, limited, or prohibited activities that may interfere with the integrity of the completed remedial actions. However, cracking and root damage to the paved portion of the landfill remains and continues to slowly worsen. In 2019, there was an observation of several newer, deeper cracks, approximately 1-inch wide, in the western portion of the motorcycle training area at OU 1. Several other smaller cracks were also observed, similar to previous years, and there appears to have been some settling (see Table 4-4). The Navy intends to address these issues as part of comprehensive remedy optimization.

4.3.2 Five-Year Review Site Inspection

An inspection of OU 1, OU 2 Area 2, OU 2 Area 8, Site 23, Area 7, and Area 22 was conducted in accordance with EPA guidance for FYRs (EPA, 2001). The site inspection provided a means to verify that the remedies are protective of human health and the environment and to assist in identifying recommendations for additional/corrective actions to document that the remedies selected in the OU 1 and OU 2 RODs continue to be functioning as intended. As noted in Section 1, Site 23, Area 7, and Area 22 are not included in either the OU 1 or OU 2 ROD. However, the Navy established ICs at these sites following either a removal action (Site 23) or site investigation (Areas 7 and 22) to be conservative.

The site inspections for this sixth FYR were conducted on July 17, 2024, by the following personnel:

Name	Organization	Role
Lindsey Wielick	Liberty JV	Environmental Scientist
Michael Meyer	Battelle	Project Manager

A FYR site inspection checklist along with photographs were used to guide the visual inspections at each site and ultimately, assess the protectiveness of the remedies. The completed FYR site inspection checklists and photographic log are provided in Appendices I and J, respectively. A summary of the site inspection findings is provided in the remainder of this subsection.

4.3.2.1 OU 1 Site Inspection Summary

Land Use Controls at OU 1: Observations during the site inspection were consistent with those in the annual LUC inspection reports (Navy, 2020b, 2022a, 2023d, 2024c) and indicate that LUCs are monitored regularly and are functioning as intended. Access to OU 1 is controlled, excavations within OU 1 are controlled through a permit process, and the only wells installed during this FYR period were associated with additional investigation activities (not drinking water).

Tide Gate: The tide gate was replaced during this FYR period (Navy, 2024d) and the new tide gate was observed to be functioning as intended during the site inspection. The tide gate was replaced because normal wear and tear on the previous tide gate had caused damage that could no longer be repaired due to a lack of available parts for the older unit. The Navy elected to upgrade the tide gate to ensure:

1. No loss of tide gate protection in event of further damage
2. Access to replacement parts from an in-state supplier.

Phytoremediation: Consistent with the latest annual O&M report (Navy, 2024d), tree health was observed to be poor in both plantations. Numerous trees and large branches were observed to have fallen, and the canopy is no longer closed. Leaf density is low on many trees, and some standing dead or nearly dead trees were observed.

Landfill Cover: Similar to the fourth and fifth FYRs (Navy, 2015a, 2020a), there are several ~1-inch wide cracks traversing the Central Landfill from east to west and north to south; there is significant bulging and cracking caused by tree roots outside the southeast corner of the North Plantation; and evidence of continued water ponding in the southern portion of the Central Landfill (see Appendix J). The brush and alder trees growing through the asphalt pavement along old building foundations just north of the South Plantation that were noted during the previous FYRs are still present.

4.3.2.2 OU 2 Site Inspection Summary

Site conditions observed at OU 2 Area 2, OU 2 Area 8, Site 23, Area 7, and Area 22 indicated that LUC requirements are currently being met, as confirmed in Section 4.3.1.

Groundwater wells have been installed within this FYR period at most of these areas as part of additional investigations, but no wells have been installed for drinking water or any other purpose besides remediation. Access to all three (3) areas is controlled and digging within these areas is controlled through an excavation permit process.

Shoreline erosion was observed at the top of the riprap seawall within Area 7. If not addressed through facility maintenance activities, continued erosion could impact the paved roadway adjacent to the seawall. Maintenance of the asphalt paving within Area 7 is a LUC requirement.

Scale in Feet

0 250 500

Scale in Miles

0 0.25 0.5

Area of Detail

Highway 308 Causeway Work Area

Location of Seep SP1-1

North Plantation Work Area

Central Landfill Work Area

Keys Road Work Area

Geophysical Anomaly Investigation Area, 2014

Geophysical Anomaly Investigation Area, 2014

South Plantation Work Area

Explanation

Key Work Area

DATE: 2/26/2025 ANALYST: chiquesl

REV. 0 APPROVED: DKN

Figure_04-01_Key_Map_for_OU1Work_Areas.mxd

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Figure 4-1
Key Map for OU 1 Work Areas

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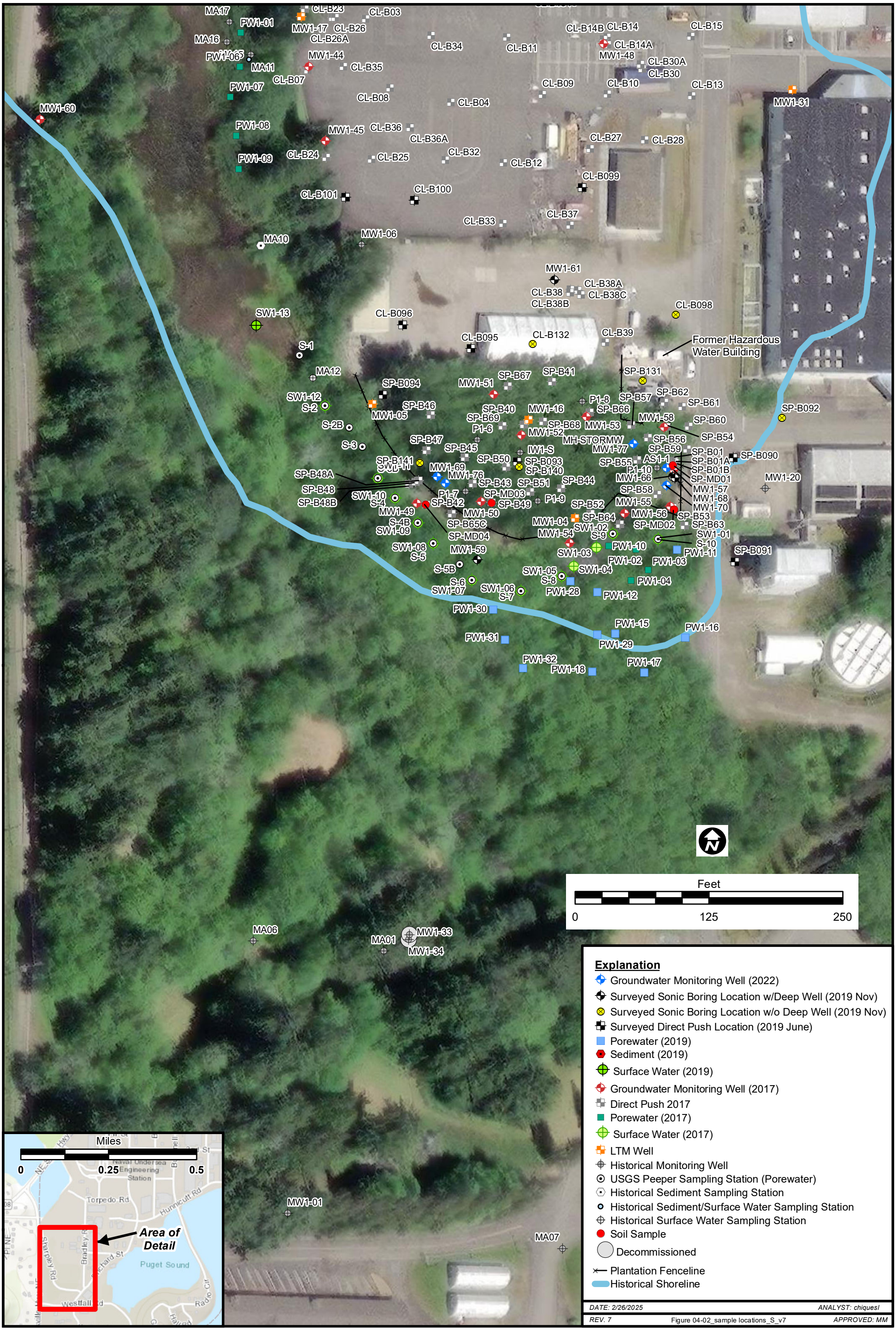

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Figure 4-2
South Plantation and Central Landfill
Sampling Locations - OU 1

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FIVE-YEAR REVIEW

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Figure 4-3
North Plantation and Central Landfill
Sampling Locations - OU 1

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FIVE-YEAR REVIEW

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Explanation

- Surveyed Sonic Boring Location w/Deep Well (2019 Nov)
- Surveyed Sonic Boring Location w/o Deep Well (2019 Nov)
- Groundwater Monitoring Well Installed 2017
- Borehole 2017
- Piezometer
- Passive-Diffusion Sampler Type
- Historical Groundwater Monitoring Well
- Sediment Sampling Station
- Sediment and Surface Water Sampling Station
- Seep Sampling Station
- Surface Water Sampling Station
- Plantation Fenceline
- Approximate Elevation Contours Based on Publicly-Available 2005 LiDAR Data (ft NAVD 88)

DATE: 3/3/2025 ANALYST: chiquesl

REV. 2 Figure 04-04_MW_Locations_GW_Elevations.mxd APPROVED: SV

TF-21
TF19
1MW-4
MW1-18
6.65
MA14
MA09
MW1-25
SP1-1
MW1-2
5.67
MW1-67
MW1-65
MW1-14
MW1-64
MW1-28
North Plantation
P1-1
P1-2
P1-3
MW1-63
MW1-41
1GW-2
MW1-11
MW1-29
P1-4
P1-5
MW1-62
1MW-1
MW1-42
MW1-15
MW1-46
MW1-09
MW1-10
MW1-43
CL-B142
MW1-47
CL-B134
MW1-17
Central Landfill
MW1-48
MA11
MW1-44
MW1-60
MW1-45
Marsh Pond
MA10
MW1-06
MW1-61
CL-B98
CL-B132
S-1
MA12
SP-B131
MW1-51
P1-8
S-2
MW1-05
South Plantation
MW1-16
SP-B92
S-2B
MW1-53
MW1-58
P1-6
MW1-52
S-3
B85
MH-STORMW
SP-B141
SP-B140
P1-10
MW1-57
S-3B
MW1-66
MW1-68
P1-7
P1-9
S-4
MW1-49
MW1-50
MW1-04
MW1-55
MW1-56
S-4B
MW1-54
S-9
S-10
S-5
S-5B
MW1-59
S-8
S-6
S-7
Area of Detail
Scale in Miles
0 0.25 0.5
Scale in Feet
0 100 200

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Figure 4-4
Monitoring Well Locations

NBK KEYPORT
SIXTH
FIVE-YEAR REVIEW

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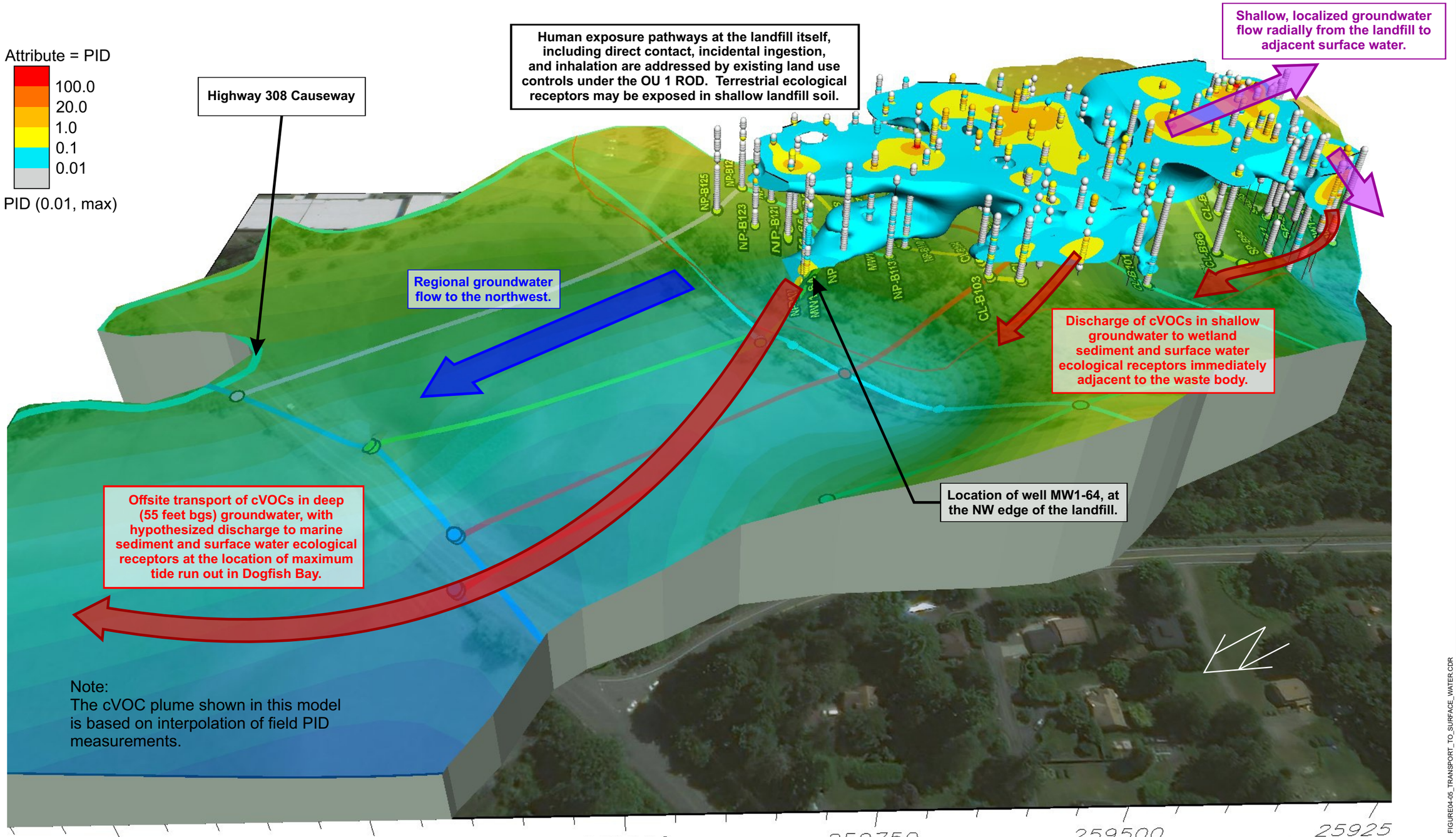

FIGURE04-05_TRANSPORT_TO_SURFACE_WATER.CDR

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Figure 4-5
OU 1 Conceptual Site Model - Transport Pathways to Surface Water

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FIVE-YEAR REVIEW

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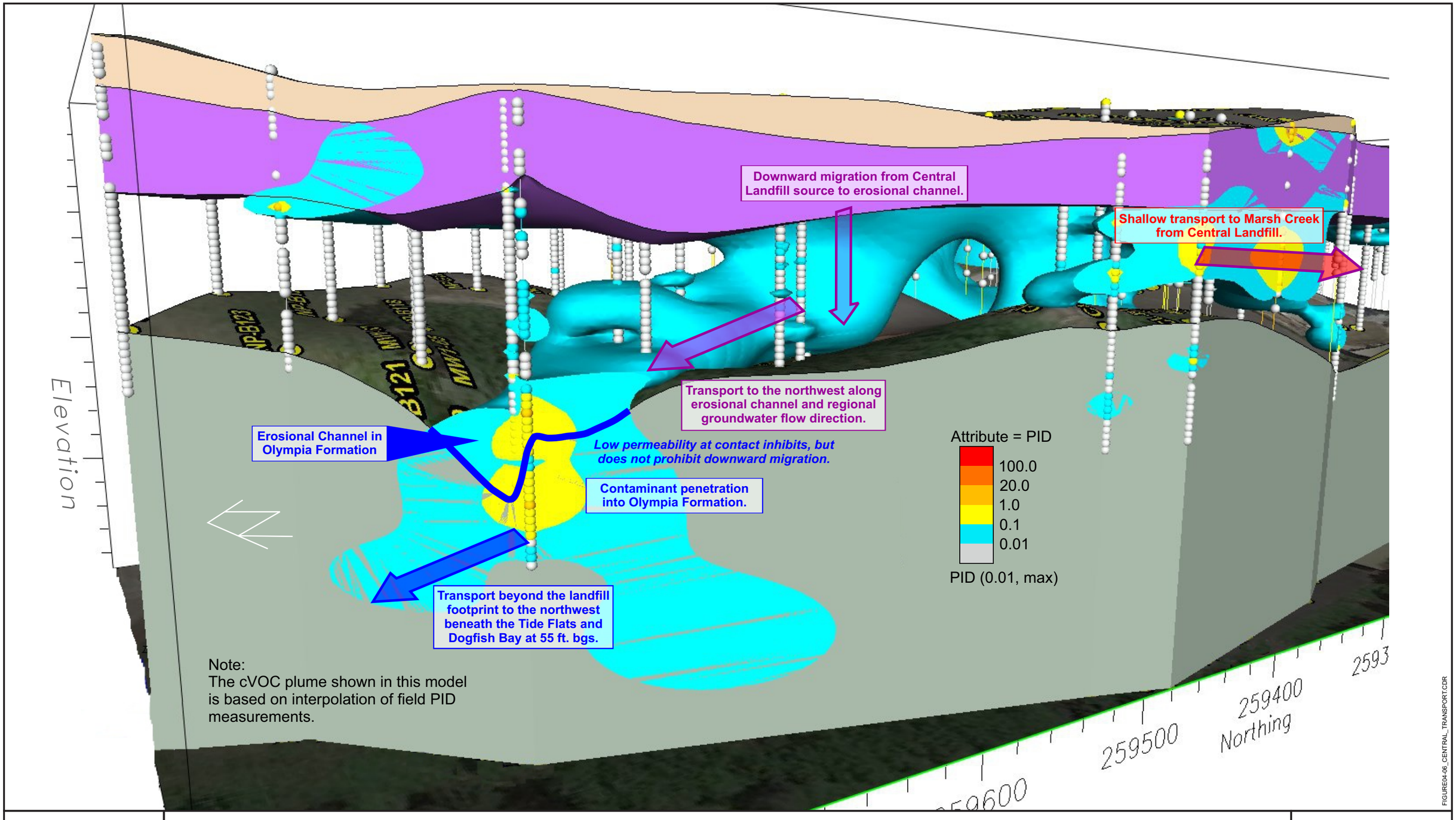

FIGURE04-06_CENTRAL_TRANSPORT.CDR

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Figure 4-6
OU 1 Conceptual Site Model - Transport Pathways from the Central Landfill

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FIVE-YEAR REVIEW

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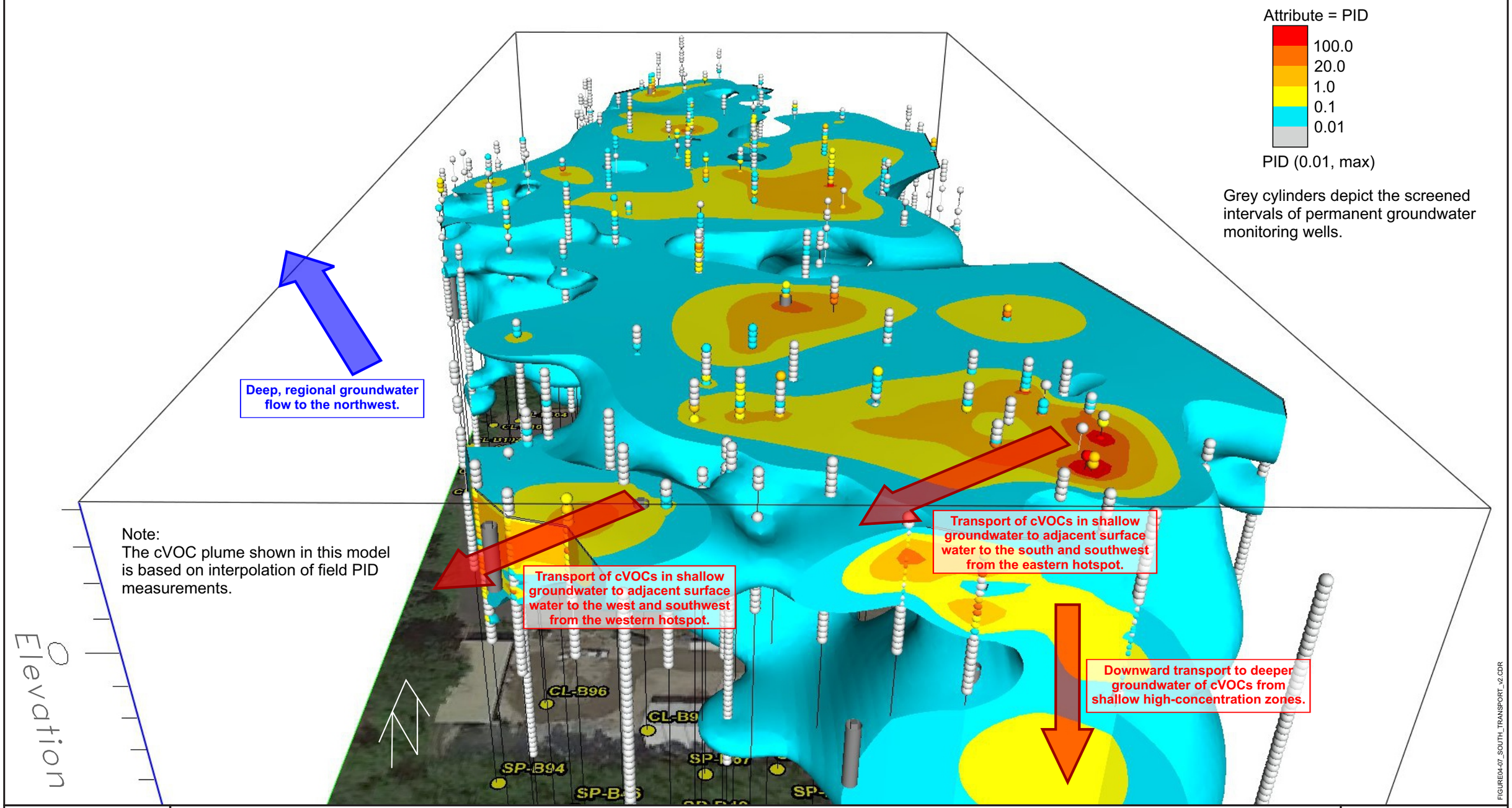

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Figure 4-7
OU 1 Conceptual Site Model - Shallow Transport Pathways from the Southern Landfill

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SIXTH
FIVE-YEAR REVIEW

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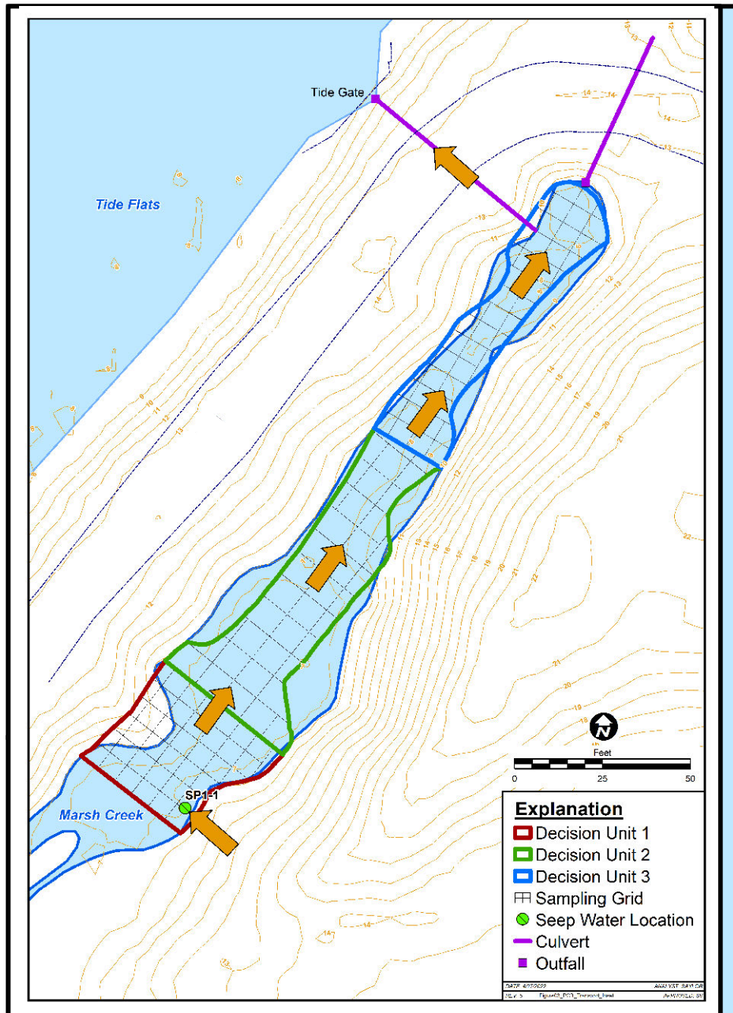

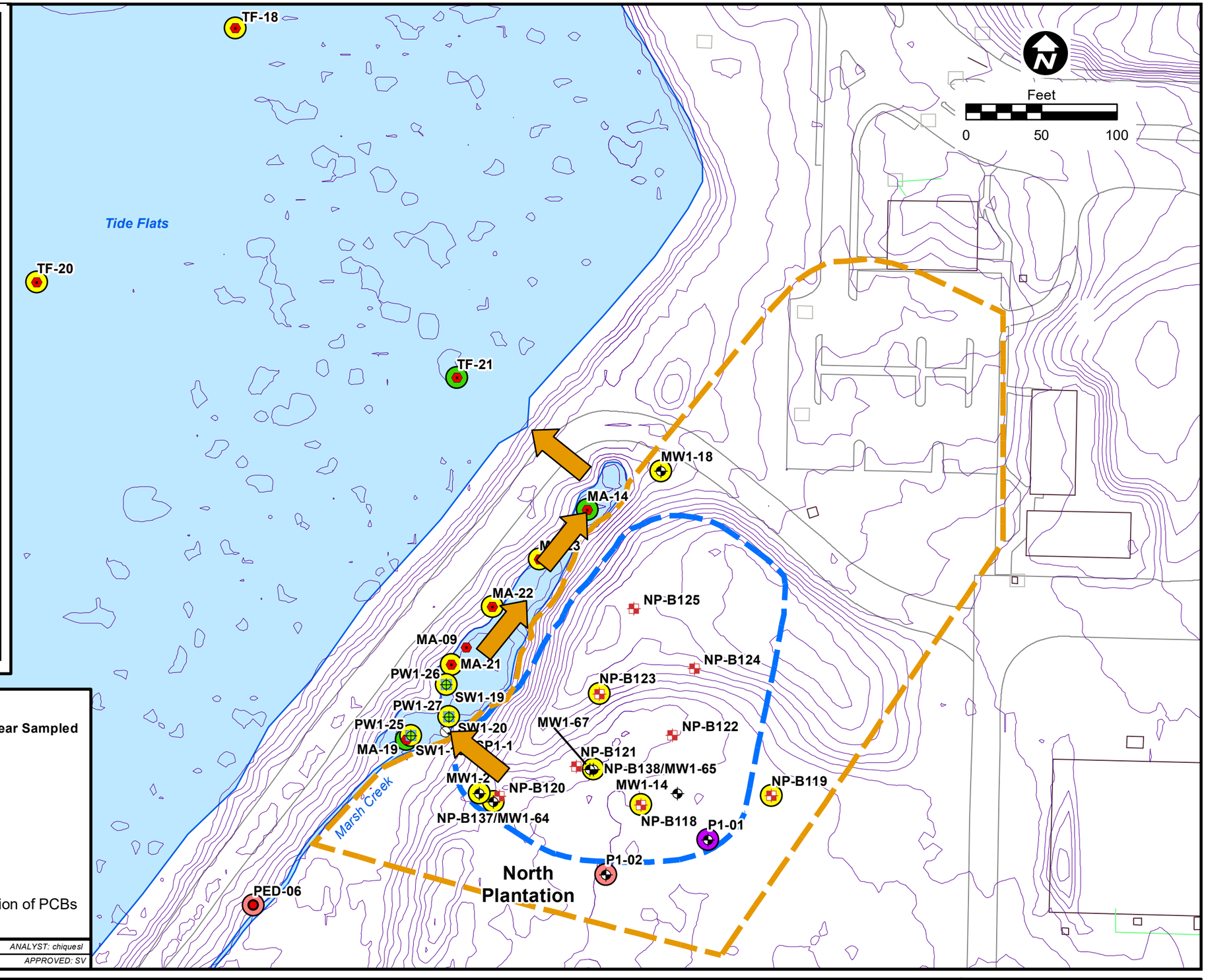

Explanation

- Approximate Area of PCBs in Soil and Groundwater
- Approximate Area of Highest Concentrations of PCBs in Soil and Groundwater
- Groundwater Monitoring Well
- Soil/Grab Groundwater Location
- Sediment Location
- Surface Water Location
- Seep Water Location

No Exceedances – Year Sampled

- 2017
- 2018
- 2019
- 2017 and 2019

- Transport Direction of PCBs

DATE: 2/27/2025 ANALYST: chiquesl
REV. 2 Figure 04-08_General Location and Transport of PCBs at OU 1.mxd APPROVED: SV

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Figure 4-8
OU 1 Conceptual Site Model - General Location and Transport of PCBs in Surface Water

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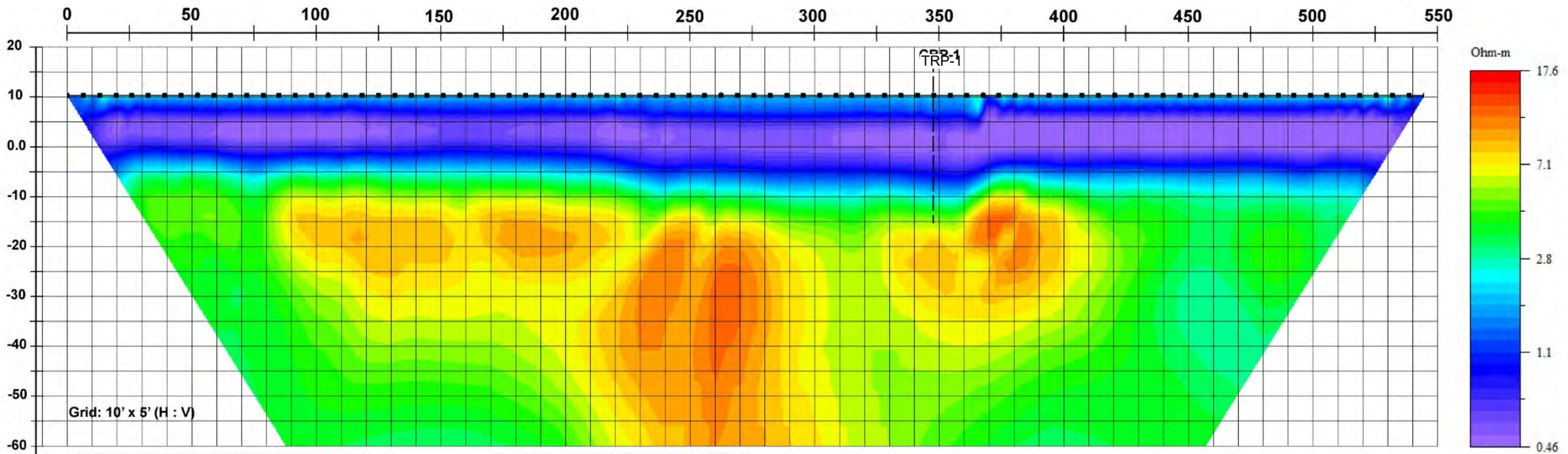
Azimuth ~37 degrees

ERT 1-1: Electrical Resistivity: Dogfish Bay ~76 feet NW of Tide Gate

(84 floating graphite electrodes on 2 m spacing, Dipole-Dipole array)



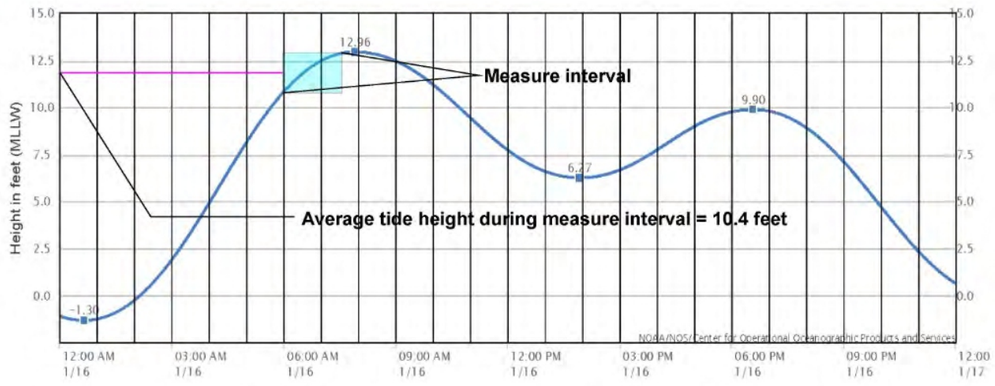


Figure04-09_Geophysics example.CDR

U.S. NAVY	**Figure 4-9** **Example of Temporal Intertidal Geophysics Transect Results**	NBK KEYPORT SIXTH FIVE-YEAR REVIEW

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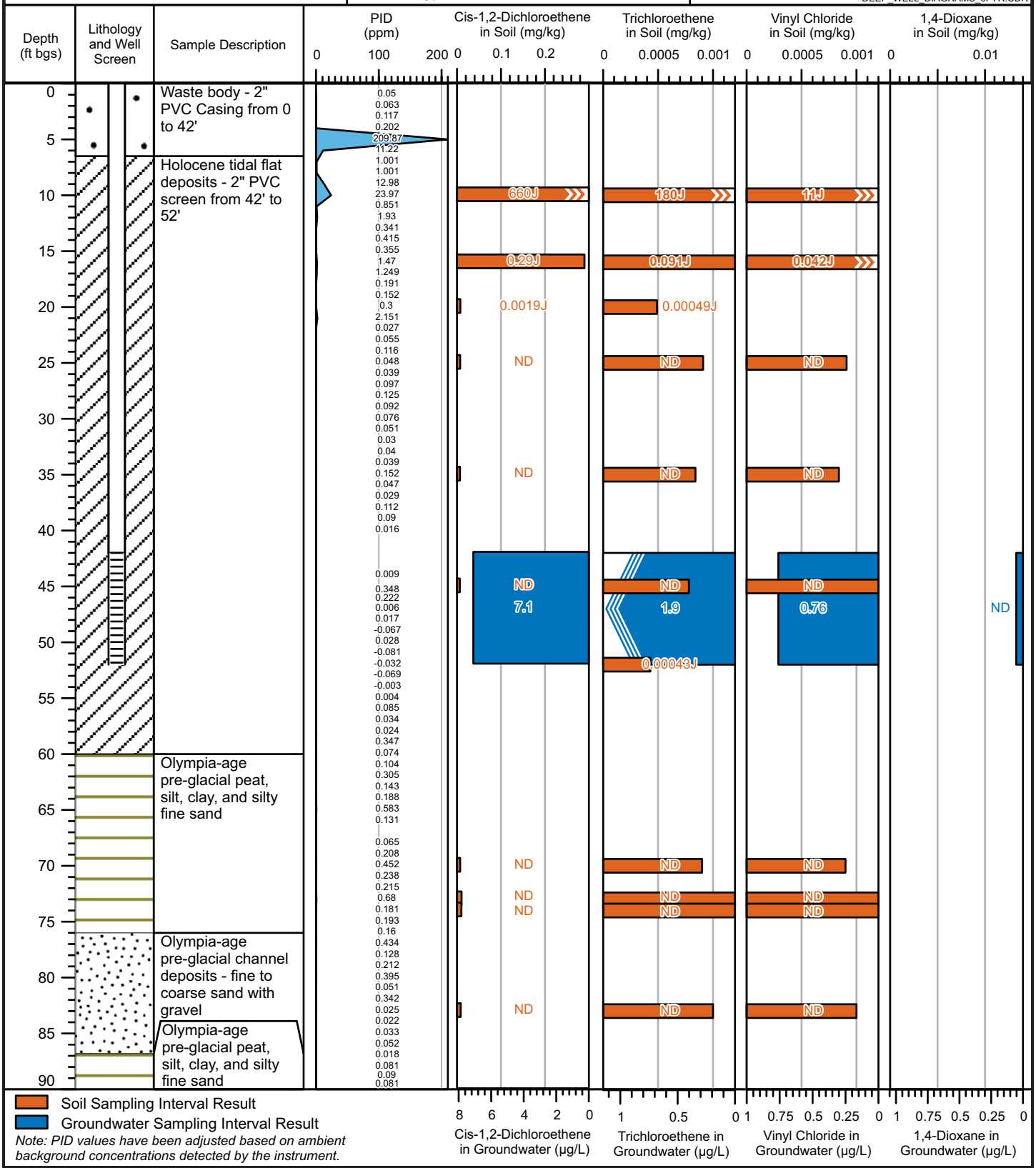
Permit Number: 22-EP058
Project Number: G24790.30
Date Logged: 4/27/2021
Geologist: Hunter Butler
Total Depth (ft bgs): 90
Reviewer: Michael Meyer

Drilling Contractor: Holt Services, Inc
Driller: J Johnson
Drilling Equipment: Terra Sonic Compact Crawler
Drilling Method: Rotosonic
Boring Diameter: 6-inch
Sampler Type: CA Split Spoon
Hammer Type: 140-lb. Auto hammer

Northing (NAD 83): 259011.7
Easting (NAD 83): 1198926
Surface Elevation (NAVD 88): 14.86 ft
Borehole Abandoned: No
Backfill Method: N/A
Device Type: 2-inch PVC monitoring well

DEEP_WELL_DIAGRAMS_6FYR.CDR



Note: PID values have been adjusted based on ambient background concentrations detected by the instrument.

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Figure 4-10
Graphical Summary of PID and Laboratory Analytical Results in MW1-69

NBK KEYPORT
SIXTH
FIVE-YEAR REVIEW

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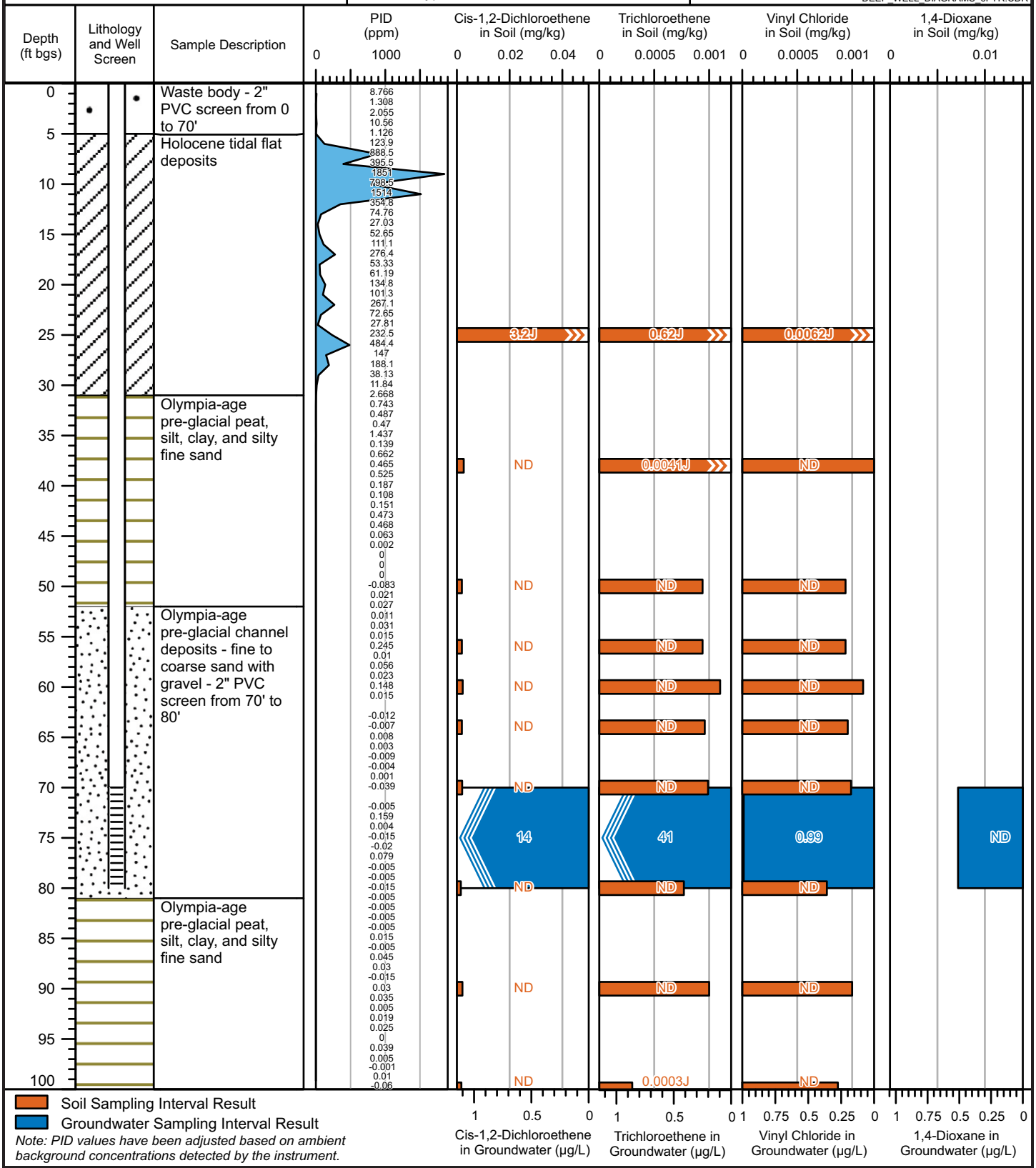
Permit Number: 22-EP058
Project Number: G24790.30
Date Logged: 4/25/2022
Geologist: Hunter Butler
Total Depth (ft bgs): 100
Reviewer: Michael Meyer

Drilling Contractor: Holt Services, Inc
Driller: J Johnson
Drilling Equipment: Terra Sonic Compact Crawler
Drilling Method: Rotosonic
Boring Diameter: 6-inch
Sampler Type: CA Split Spoon
Hammer Type: 140-lb. Auto hammer

Northing (NAD 83): 259003.5
Easting (NAD 83): 1199140
Surface Elevation (NAVD 88): 13.71 ft
Borehole Abandoned: No
Backfill Method: N/A
Device Type: 2-inch PVC monitoring well

DEEP_WELL_DIAGRAMS_6FYR.CDR



Note: PID values have been adjusted based on ambient background concentrations detected by the instrument.

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Figure 4-11
Graphical Summary of PID and Laboratory Analytical Results in MW1-70

NBK KEYPORT
SIXTH
FIVE-YEAR REVIEW

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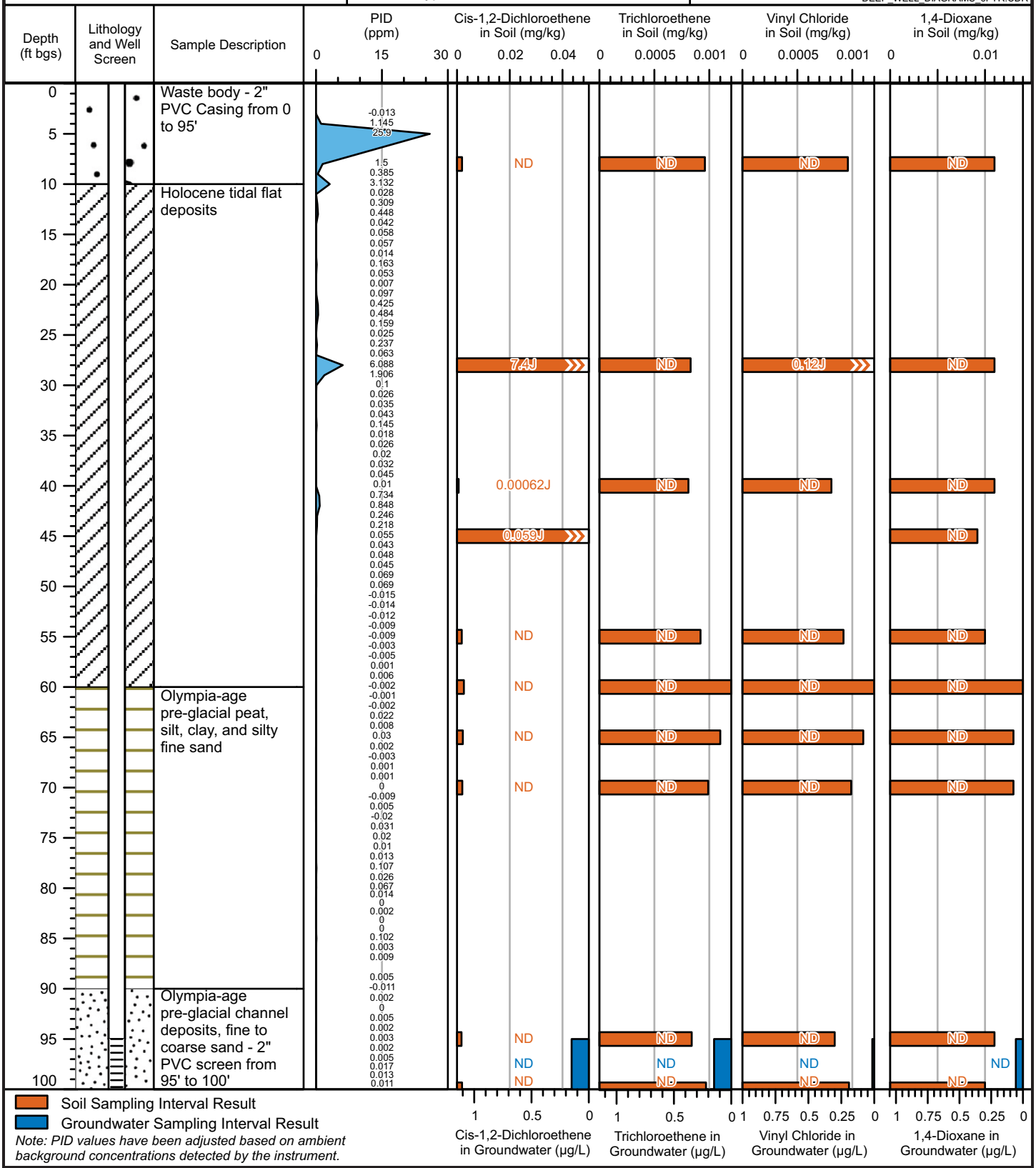
Permit Number: 22-EP058 Project Number: G24790.30 Date Logged: 5/2/2022 Geologist: Hunter Butler Total Depth (ft bgs): 100 Reviewer: Michael Meyer	Drilling Contractor: Holt Services, Inc Driller: J Johnson Drilling Equipment: Terra Sonic Compact Crawler Drilling Method: Rotosonic Boring Diameter: 6-inch Sampler Type: CA Split Spoon Hammer Type: 140-lb. Auto hammer	Northing (NAD 83): 259491.3 Easting (NAD 83): 1199038 Surface Elevation (NAVD 88): 16.96 ft Borehole Abandoned: No Backfill Method: N/A Device Type: 2-inch PVC monitoring well

DEEP_WELL_DIAGRAMS_6FYR.CDR



Note: PID values have been adjusted based on ambient background concentrations detected by the instrument.

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Figure 4-12
Graphical Summary of PID and Laboratory Analytical Results in MW1-71

NBK KEYPORT
SIXTH
FIVE-YEAR REVIEW

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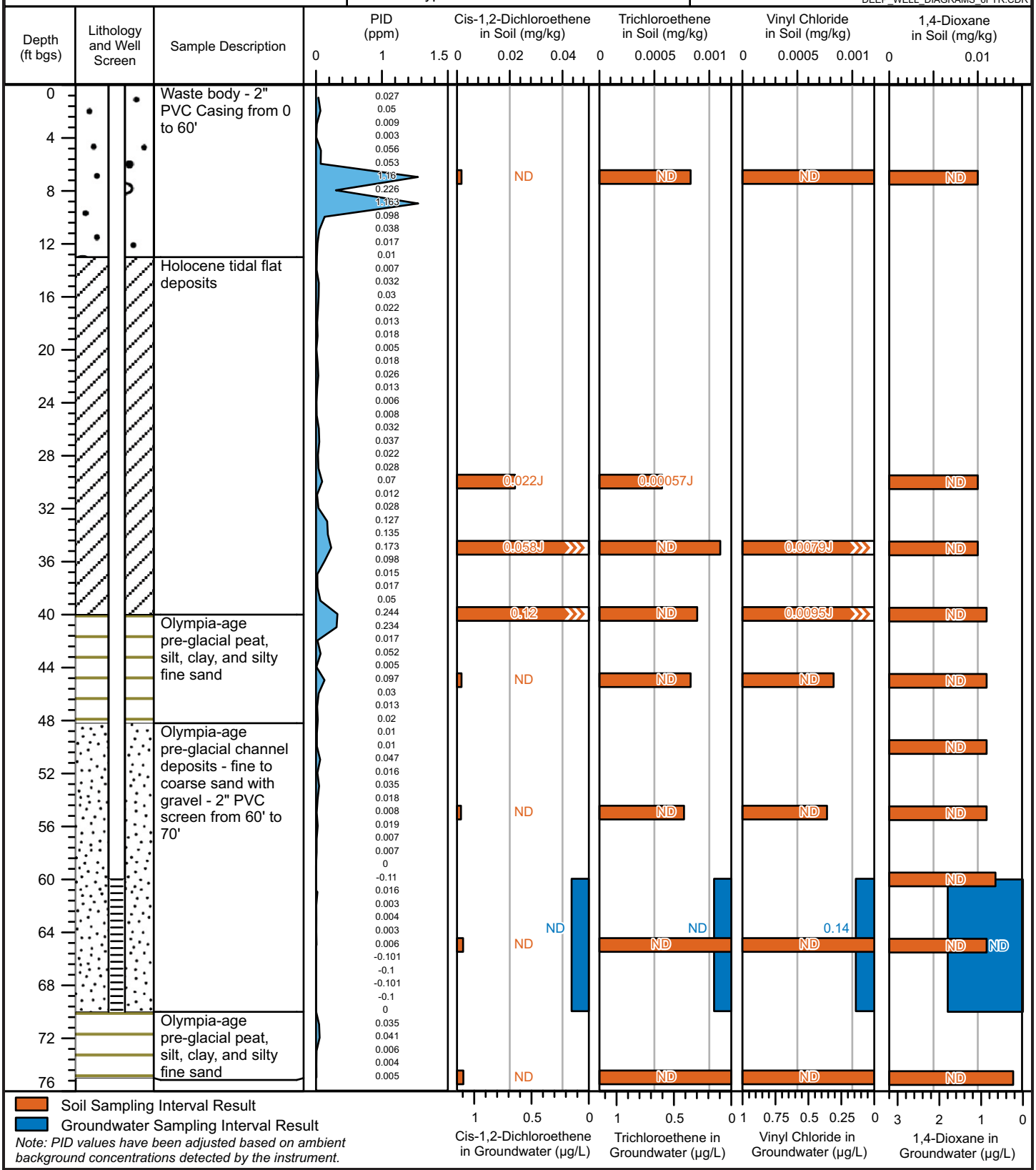
Permit Number: 22-EP058
Project Number: G24790.30
Date Logged: 5/5/2022
Geologist: Hunter Butler
Total Depth (ft bgs): 75
Reviewer: Michael Meyer

Drilling Contractor: Holt Services, Inc
Driller: J Johnson
Drilling Equipment: Terra Sonic Compact Crawler
Drilling Method: Rotosonic
Boring Diameter: 6-inch
Sampler Type: CA Split Spoon
Hammer Type: 140-lb. Auto hammer

Northing (NAD 83): 259642.4
Easting (NAD 83): 1198935
Surface Elevation (NAVD 88): 16.11 ft
Borehole Abandoned: No
Backfill Method: N/A
Device Type: 2-inch PVC monitoring well

DEEP_WELL_DIAGRAMS_6FYR.CDR



Note: PID values have been adjusted based on ambient background concentrations detected by the instrument.

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Figure 4-13
Graphical Summary of PID and Laboratory Analytical Results in MW1-72

NBK KEYPORT
SIXTH
FIVE-YEAR REVIEW

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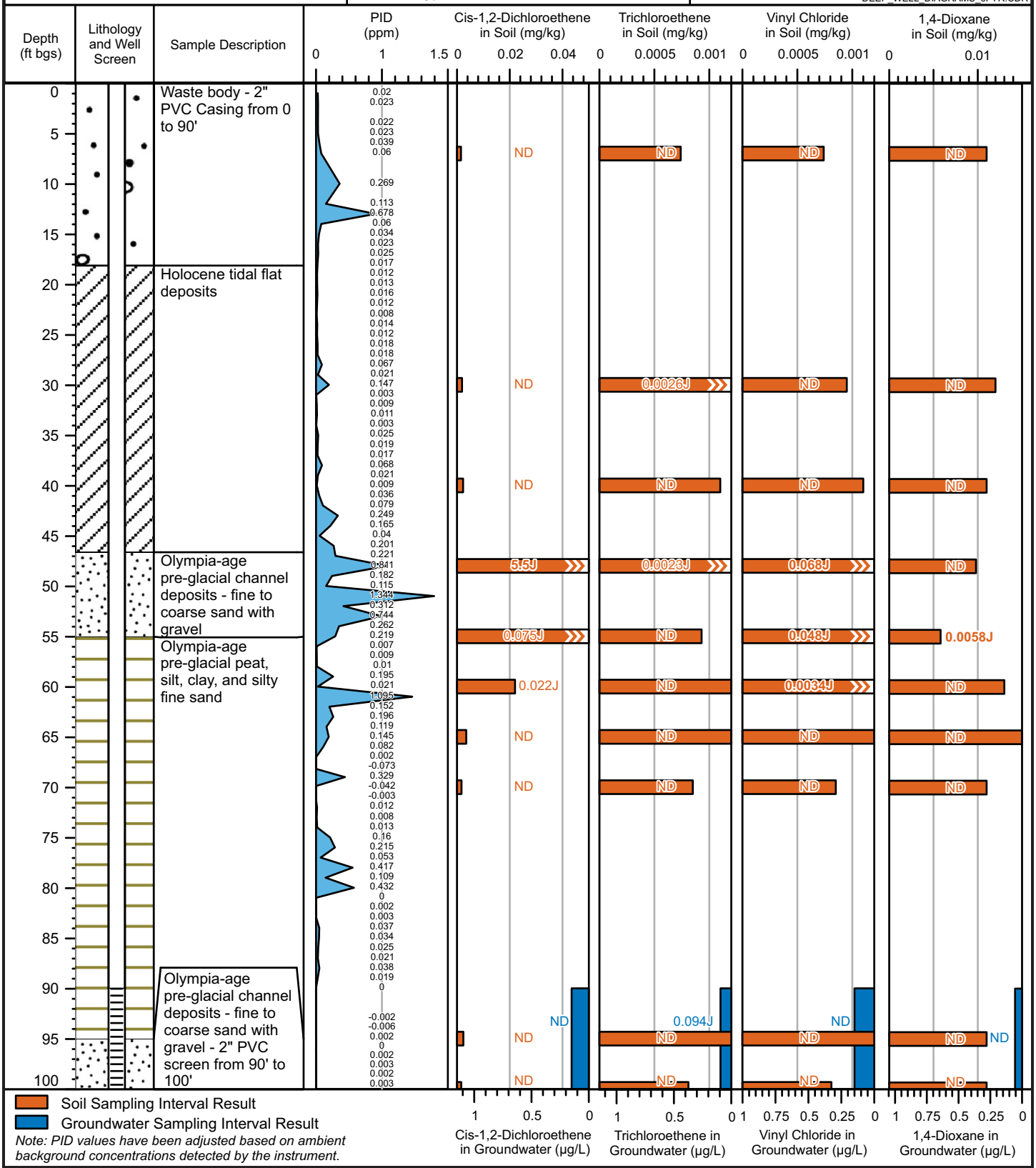
Permit Number: 22-EP058
Project Number: G24790.30
Date Logged: 5/9/2022
Geologist: Hunter Butler
Total Depth (ft bgs): 100
Reviewer: Michael Meyer

Drilling Contractor: Holt Services, Inc
Driller: J Johnson
Drilling Equipment: Terra Sonic Compact Crawler
Drilling Method: Rotosonic
Boring Diameter: 6-inch
Sampler Type: CA Split Spoon
Hammer Type: 140-lb. Auto hammer

Northing (NAD 83): 259763.3
Easting (NAD 83): 1198893
Surface Elevation (NAVD 88): 13.32 ft
Borehole Abandoned: No
Backfill Method: N/A
Device Type: 2-inch PVC monitoring well

DEEP_WELL_DIAGRAMS_6FYR.CDR



Note: PID values have been adjusted based on ambient background concentrations detected by the instrument.

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Figure 4-14
Graphical Summary of PID and Laboratory Analytical Results in MW1-73

NBK KEYPORT
SIXTH
FIVE-YEAR REVIEW

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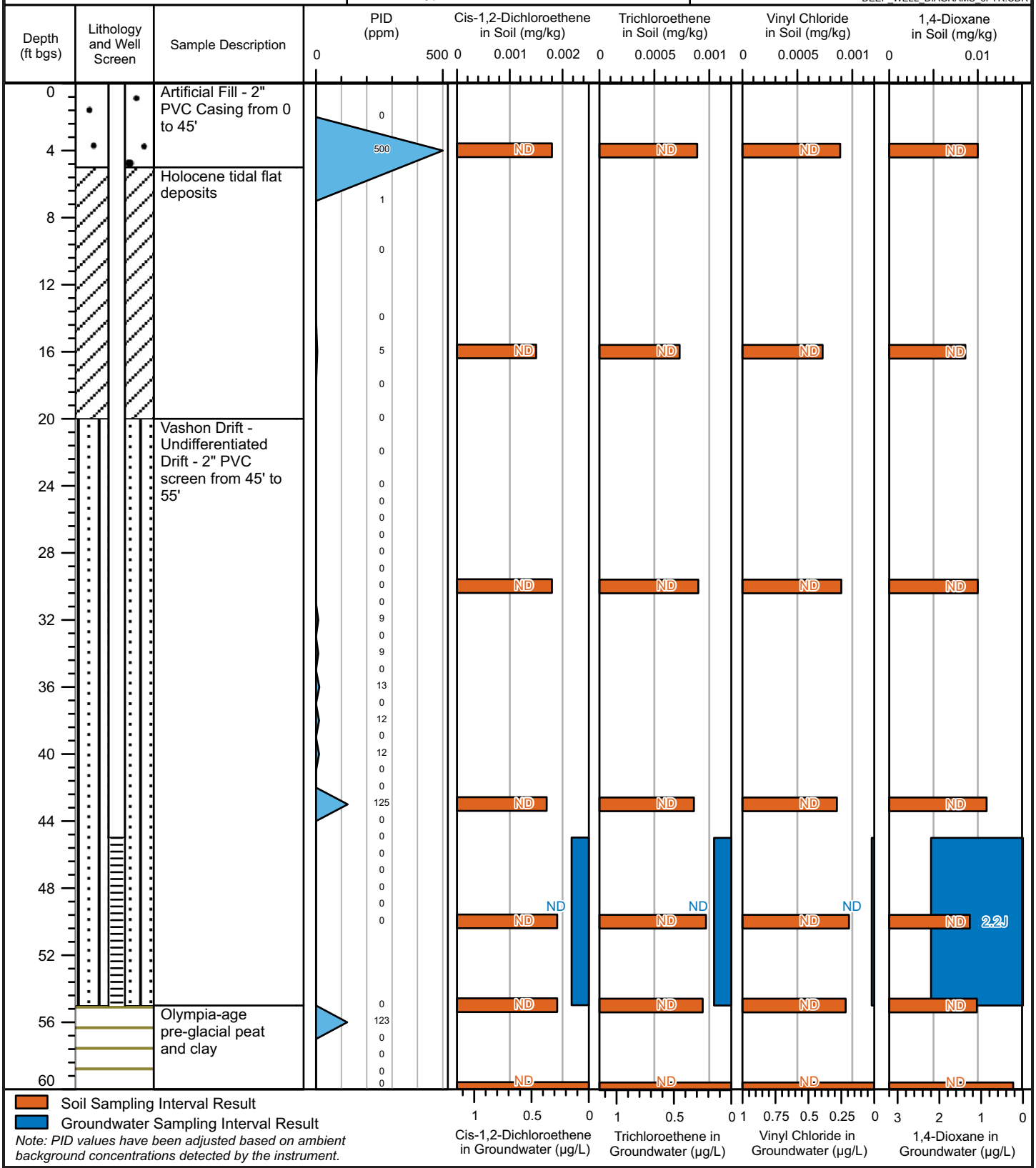
Permit Number: 22-EP058
Project Number: G24790.30
Date Logged: 7/12/2022
Geologist: Michael Meyer
Total Depth (ft bgs): 60
Reviewer: Steven Verdibello

Drilling Contractor: Holt Services, Inc
Driller: J Johnson
Drilling Equipment: Terra Sonic Compact Crawler
Drilling Method: Rotosonic
Boring Diameter: 6-inch
Sampler Type: CA Split Spoon
Hammer Type: 140-lb. Auto hammer

Northing (NAD 83): 260210.6
Easting (NAD 83): 1198481
Surface Elevation (NAVD 88): 13.69 ft
Borehole Abandoned: No
Backfill Method: N/A
Device Type: 2-inch PVC monitoring well

DEEP_WELL_DIAGRAMS_6FYR.CDR



Note: PID values have been adjusted based on ambient background concentrations detected by the instrument.

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Figure 4-15
Graphical Summary of PID and Laboratory Analytical Results in MW1-74

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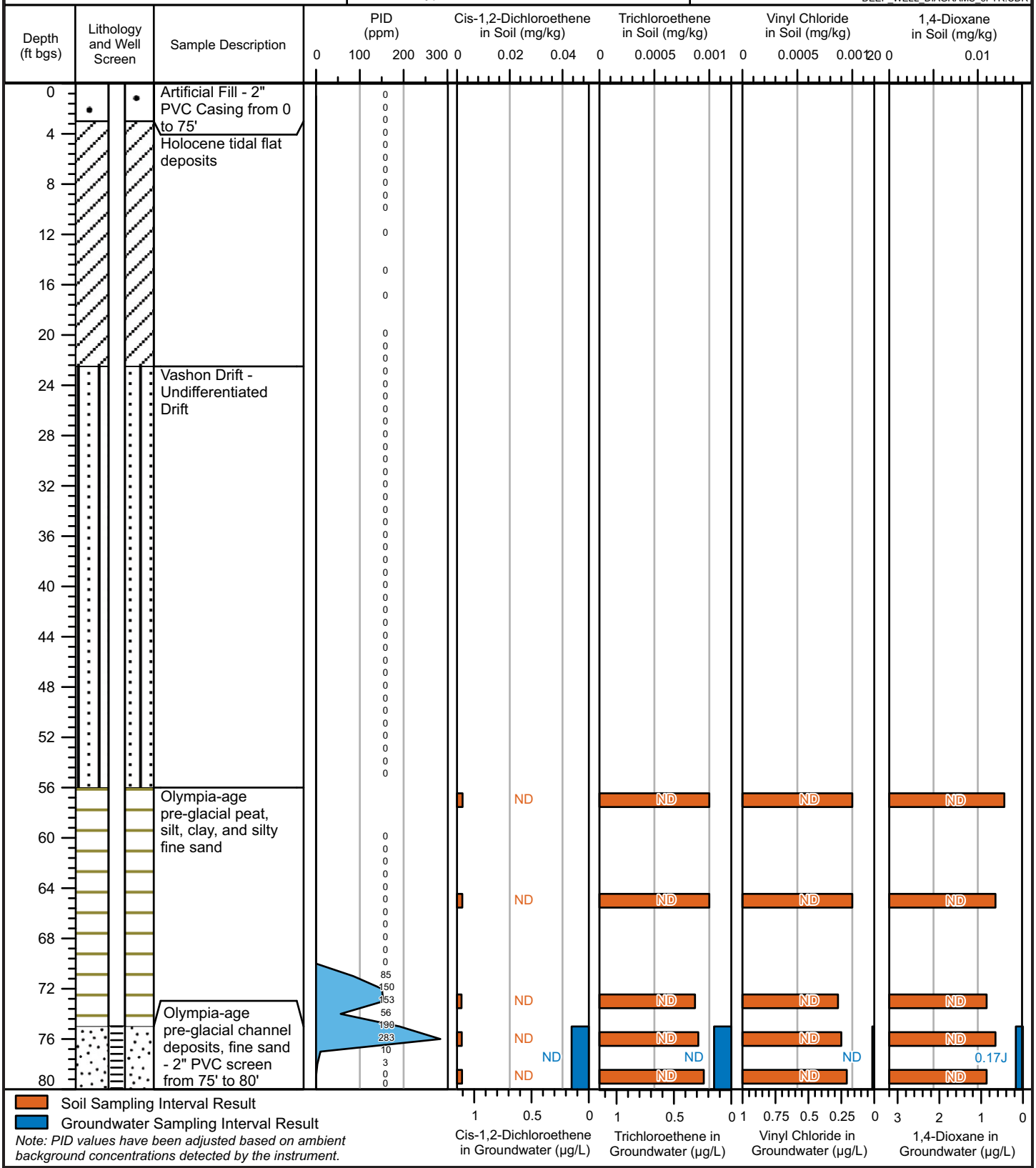
Permit Number: 22-EP058
Project Number: G24790.30
Date Logged: 7/11/2022
Geologist: Michael Meyer
Total Depth (ft bgs): 80
Reviewer: Steven Verdibello

Drilling Contractor: Holt Services, Inc
Driller: J Johnson
Drilling Equipment: Terra Sonic Compact Crawler
Drilling Method: Rotosonic
Boring Diameter: 6-inch
Sampler Type: CA Split Spoon
Hammer Type: 140-lb. Auto hammer

Northing (NAD 83): 260200.5
Easting (NAD 83): 1198474
Surface Elevation (NAVD 88): 13.66 ft
Borehole Abandoned: No
Backfill Method: N/A
Device Type: 2-inch PVC monitoring well

DEEP_WELL_DIAGRAMS_6FYR.CDR



Note: PID values have been adjusted based on ambient background concentrations detected by the instrument.

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Figure 4-16
Graphical Summary of PID and Laboratory Analytical Results in MW1-75

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FIVE-YEAR REVIEW

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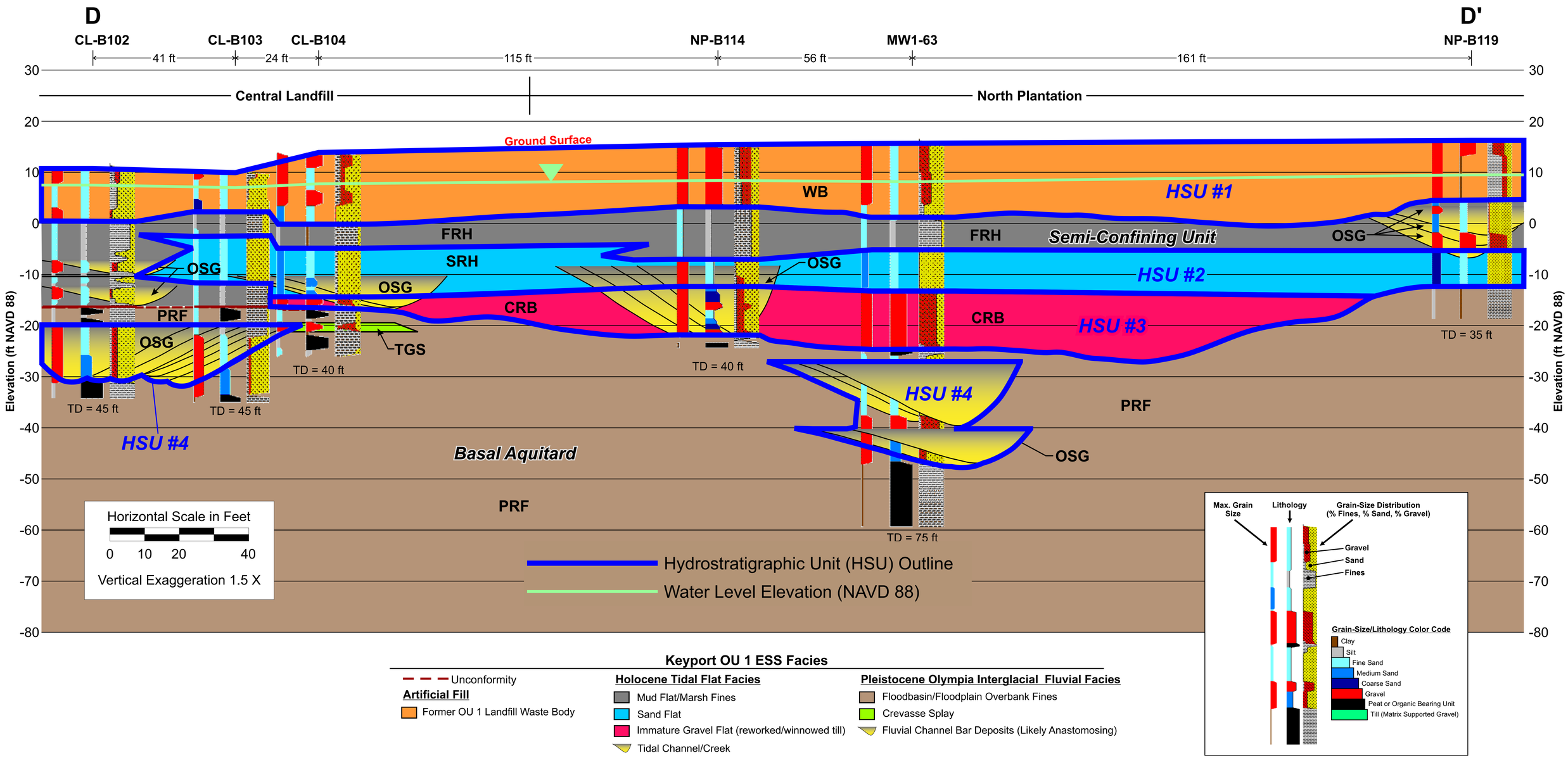

PLATE_C-09_KEYPORT CS#4_D-D'_HSUs_v6.CDR

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Figure 4-17
Example Environmental Sequence Stratigraphy Cross Section with Hydrostratigraphic Units

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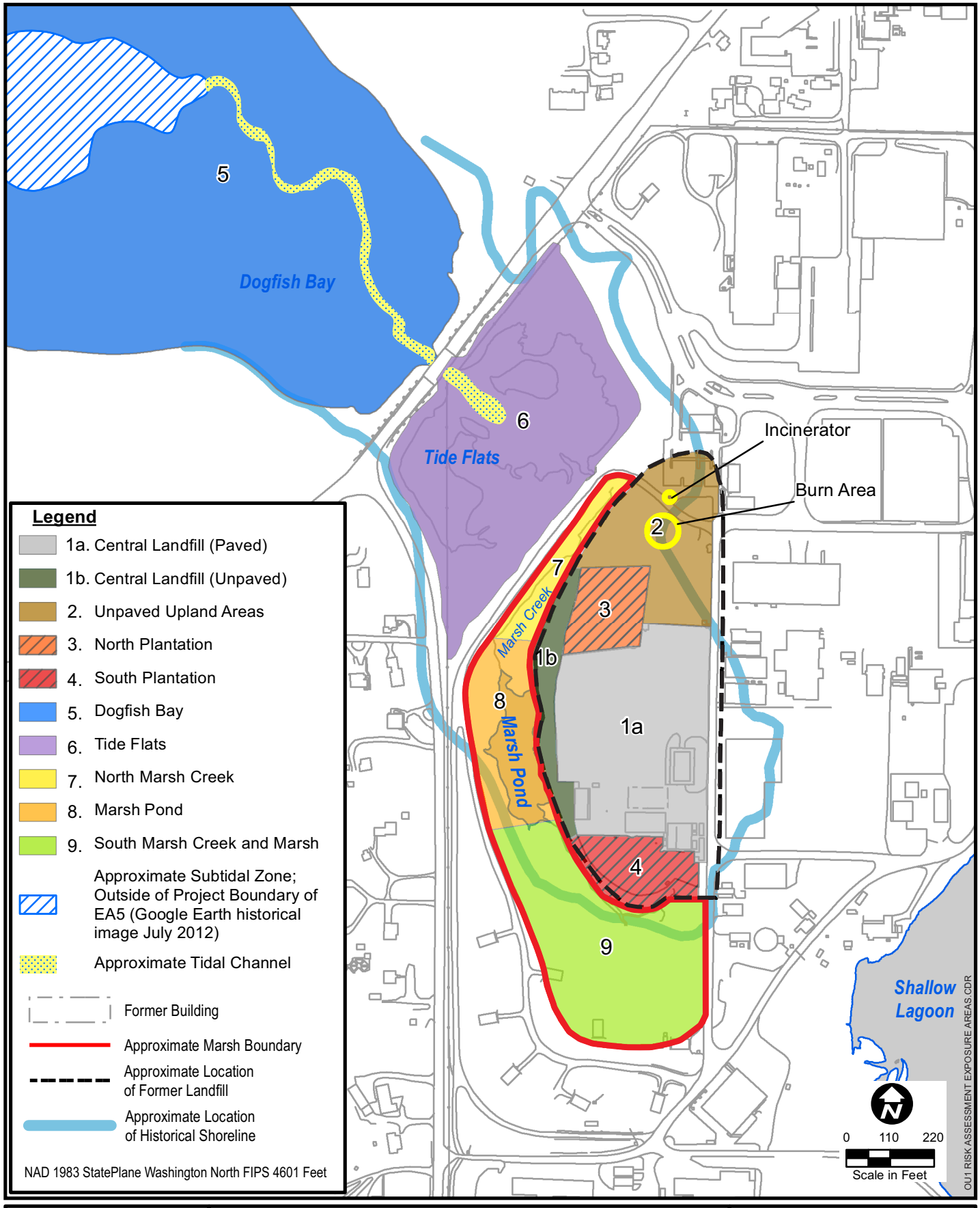

U.S. NAVY	**Figure 4-18** **Exposure Areas Defined for OU 1** **Risk Assessment Addendum**	NBK KEYPORT SIXTH FIVE-YEAR REVIEW

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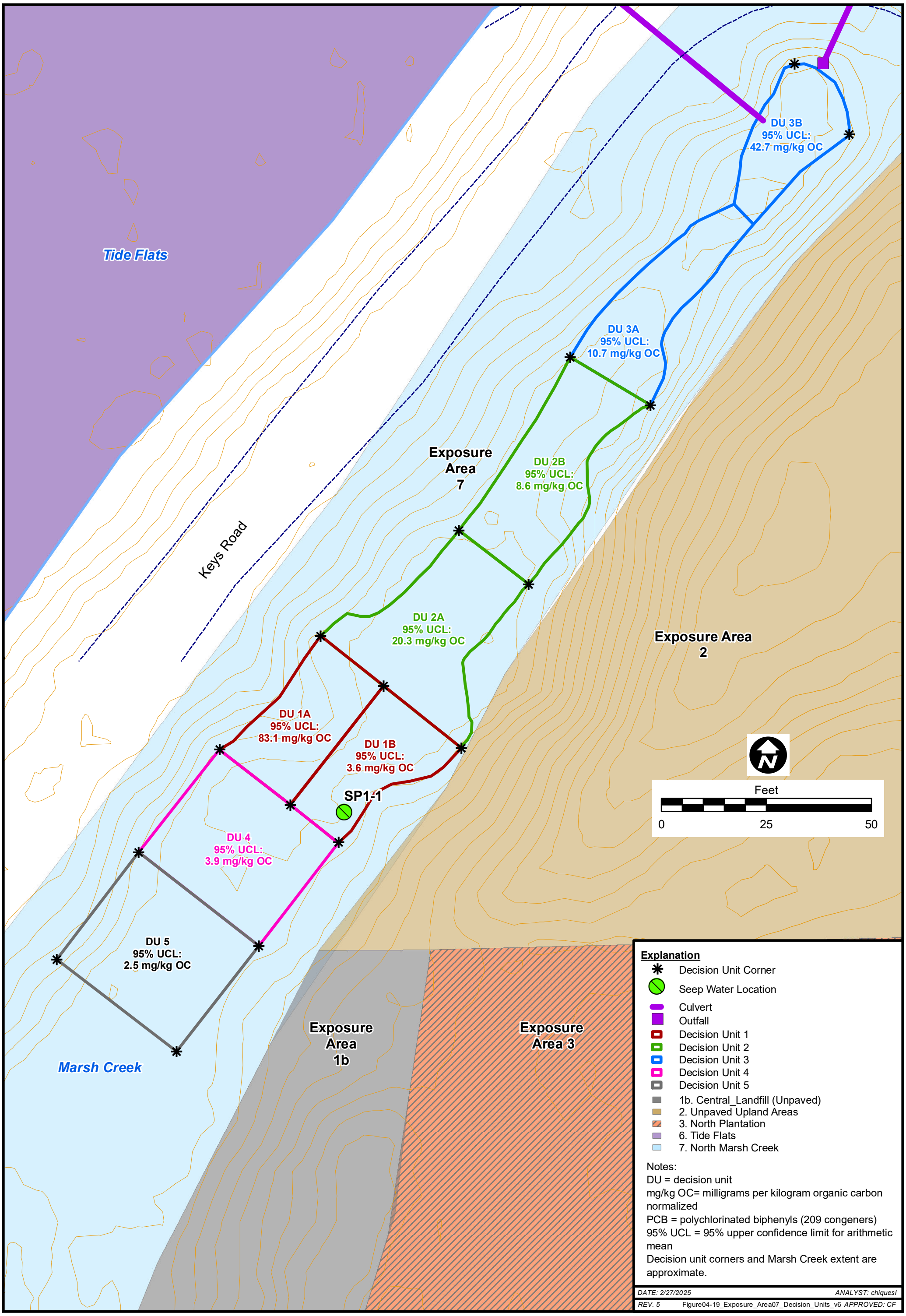

U.S. NAVY	**Figure 4-19** **September 2023 Results of Follow-Up ISM Sediment Sampling**	NBK KEYPORT SIXTH FIVE-YEAR REVIEW

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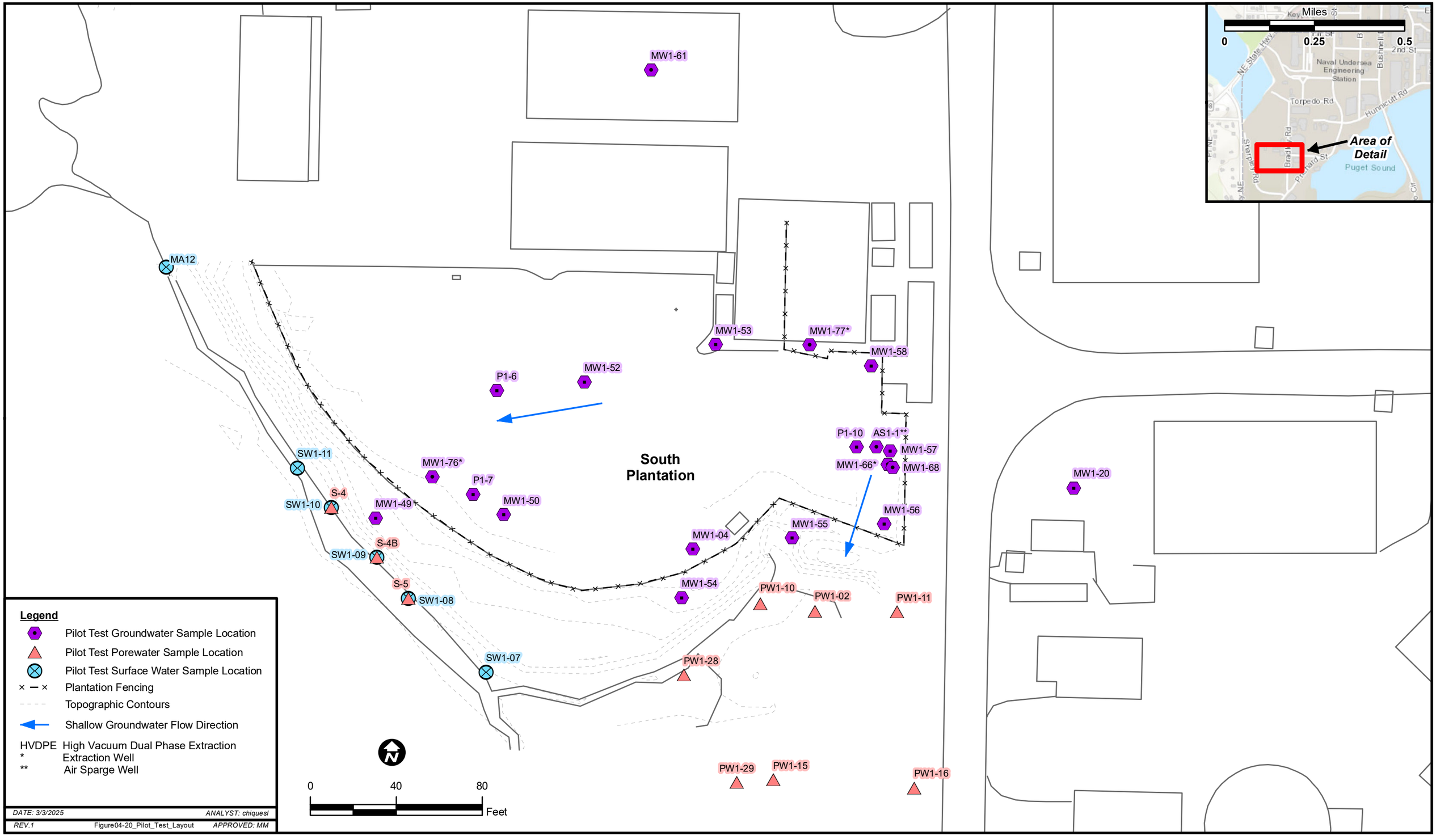

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Figure 4-20
HVDPE Pilot Test Layout

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FIVE-YEAR REVIEW

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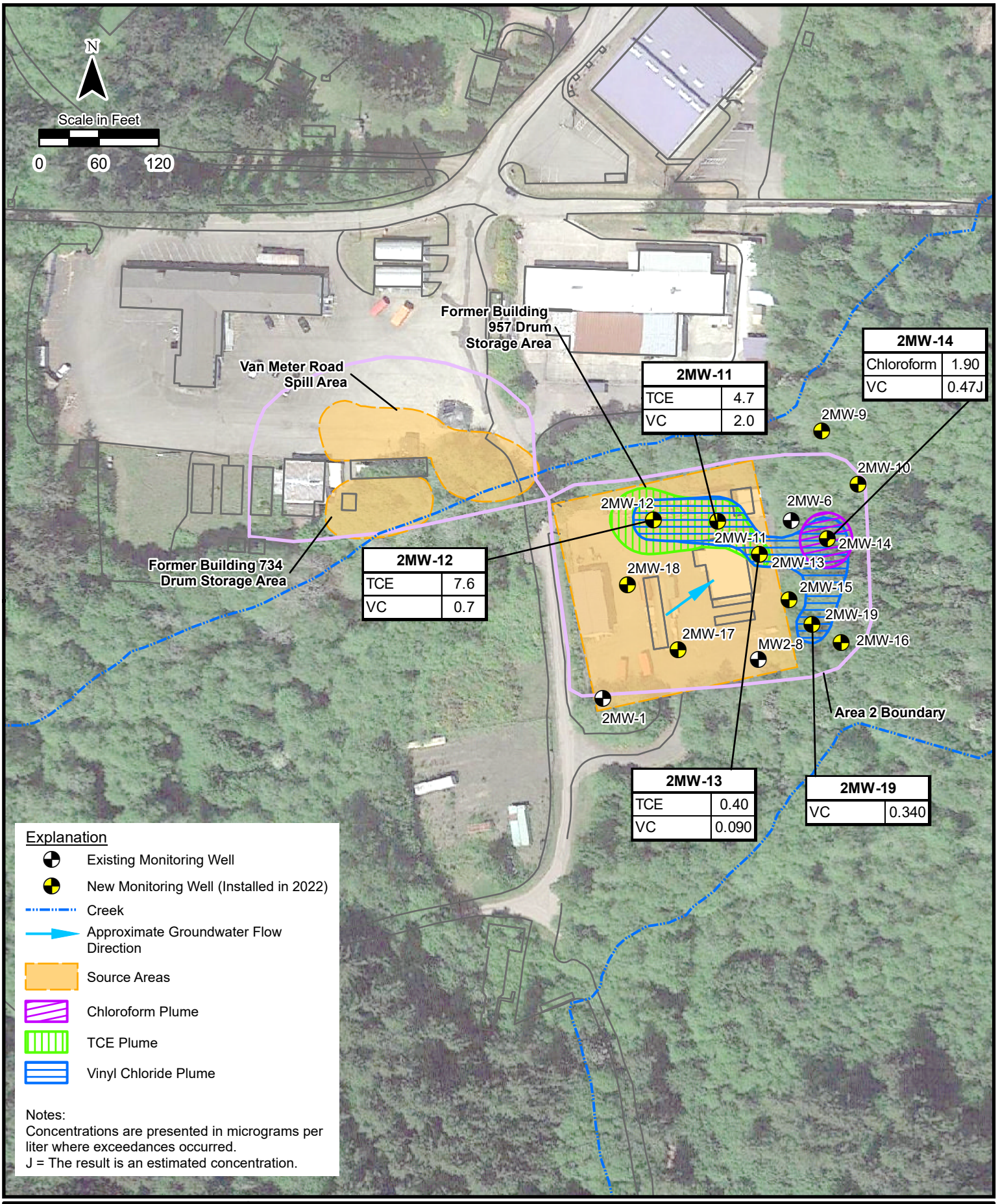

U.S. NAVY

Figure 4-21
OU 2 Area 2 Summary of 2022 Groundwater Sampling Results

NBK KEYPORT
SIXTH
FIVE-YEAR REVIEW

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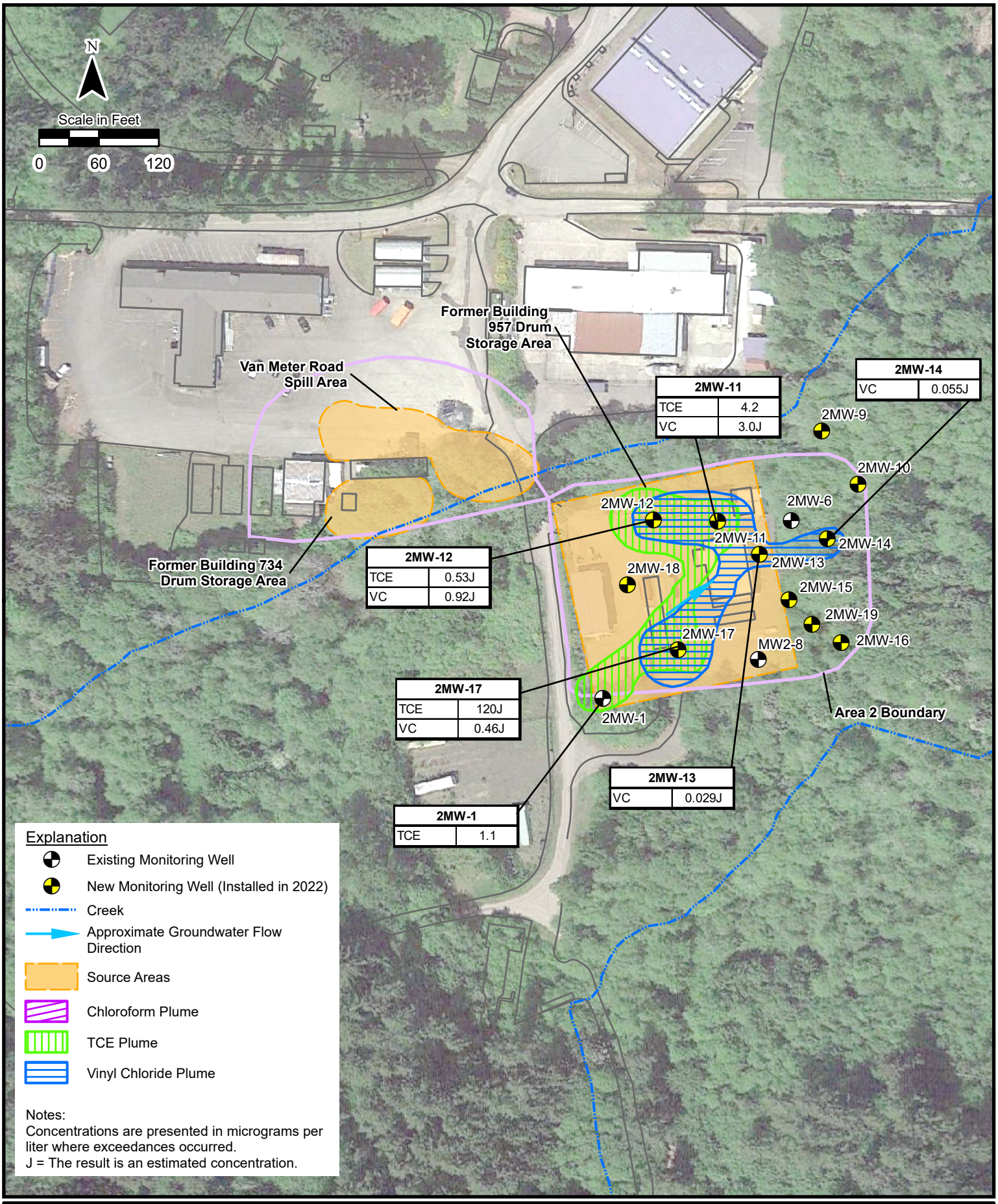

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Figure 4-22
OU 2 Area 2 Summary of 2023 Groundwater Sampling Results

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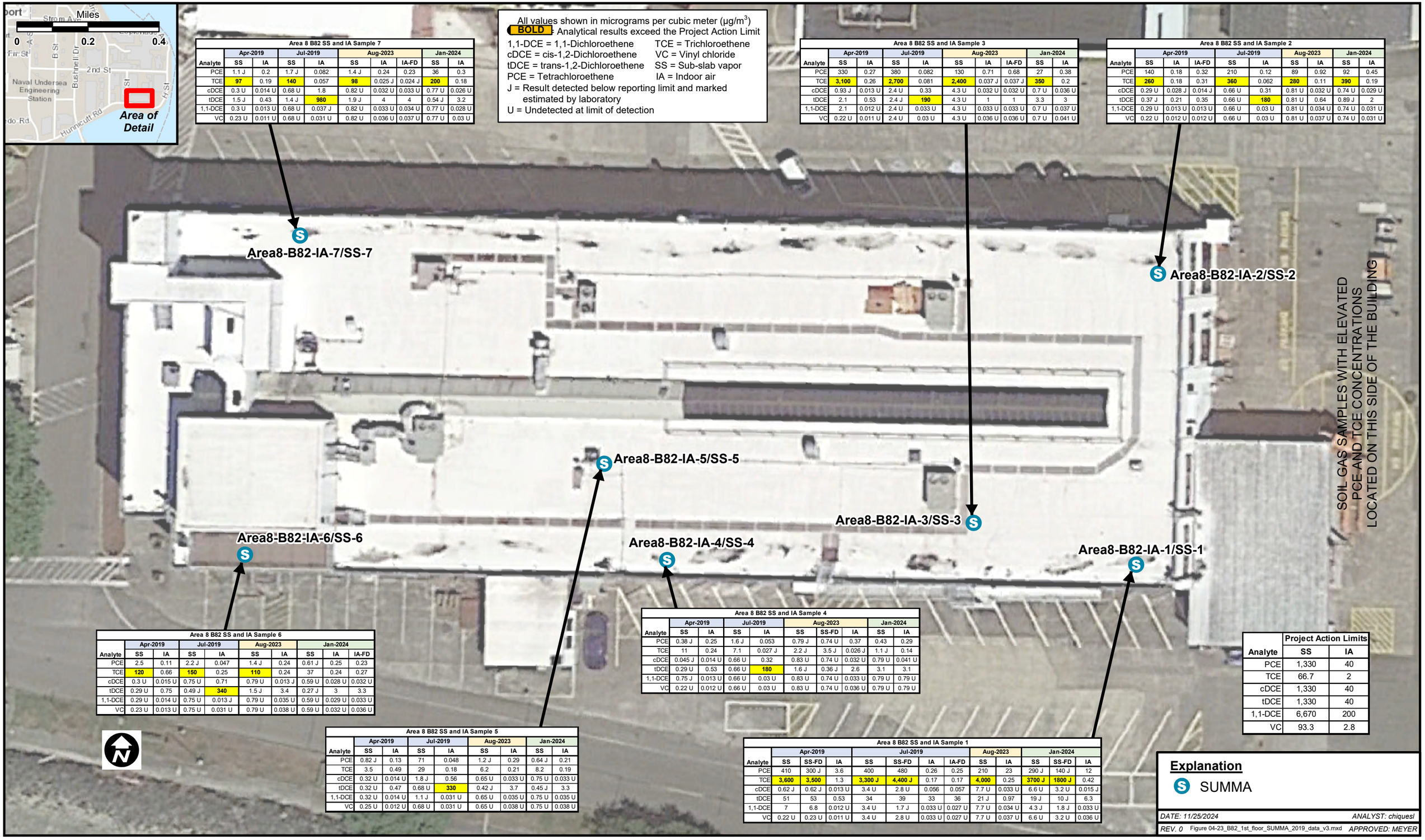

All values shown in micrograms per cubic meter (µg/m^3)
BOLD = Analytical results exceed the Project Action Limit

1,1-DCE = 1,1-Dichloroethene
cDCE = cis-1,2-Dichloroethene
tDCE = trans-1,2-Dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl chloride
SS = Sub-slab vapor
IA = Indoor air
J = Result detected below reporting limit and marked estimated by laboratory
U = Undetected at limit of detection

Area 8 B82 SS and IA Sample 7

	Apr-2019		Jul-2019		Aug-2023			Jan-2024	
Analyte	SS	IA	SS	IA	SS	IA	IA-FD	SS	IA
PCE	1.1 J	0.2	1.7 J	0.082	1.4 J	0.24	0.23	36	0.3
TCE	**97**	0.19	**140**	0.057	**98**	0.025 J	0.024 J	**200**	0.18
cDCE	0.3 U	0.014 U	0.68 U	1.8	0.82 U	0.032 U	0.033 U	0.77 U	0.026 U
tDCE	1.5 J	0.43	1.4 J	**980**	1.9 J	4	4	0.54 J	3.2
1,1-DCE	0.3 U	0.013 U	0.68 U	0.037 J	0.82 U	0.033 U	0.034 U	0.77 U	0.028 U
VC	0.23 U	0.011 U	0.68 U	0.031 U	0.82 U	0.036 U	0.037 U	0.77 U	0.03 U

Area 8 B82 SS and IA Sample 3

	Apr-2019		Jul-2019		Aug-2023			Jan-2024	
Analyte	SS	IA	SS	IA	SS	IA	IA-FD	SS	IA
PCE	330	0.27	380	0.082	130	0.71	0.68	27	0.38
TCE	**3,100**	0.26	**2,700**	0.081	**2,400**	0.037 J	0.037 J	**350**	0.2
cDCE	0.93 J	0.013 U	2.4 U	0.33	4.3 U	0.032 U	0.032 U	0.7 U	0.036 U
tDCE	2.1	0.53	2.4 J	**190**	4.3 U	1	1	3.3	3
1,1-DCE	2.1	0.012 U	2.4 U	0.033 U	4.3 U	0.033 U	0.033 U	0.7 U	0.037 U
VC	0.22 U	0.011 U	2.4 U	0.03 U	4.3 U	0.036 U	0.036 U	0.7 U	0.041 U

Area 8 B82 SS and IA Sample 2

	Apr-2019			Jul-2019		Aug-2023		Jan-2024	
Analyte	SS	IA	IA-FD	SS	IA	SS	IA	SS	IA
PCE	140	0.18	0.32	210	0.12	89	0.92	92	0.45
TCE	**260**	0.18	0.31	**360**	0.062	**280**	0.11	**390**	0.19
cDCE	0.29 U	0.028 J	0.014 J	0.66 U	0.31	0.81 U	0.032 U	0.74 U	0.029 U
tDCE	0.37 J	0.21	0.35	0.66 U	**180**	0.81 U	0.64	0.89 J	2
1,1-DCE	0.29 U	0.013 U	0.013 U	0.66 U	0.03 U	0.81 U	0.034 U	0.74 U	0.031 U
VC	0.22 U	0.012 U	0.012 U	0.66 U	0.03 U	0.81 U	0.037 U	0.74 U	0.031 U

Area 8 B82 SS and IA Sample 6

	Apr-2019		Jul-2019		Aug-2023		Jan-2024		
Analyte	SS	IA	SS	IA	SS	IA	SS	IA	IA-FD
PCE	2.5	0.11	2.2 J	0.047	1.4 J	0.24	0.61 J	0.25	0.23
TCE	**120**	0.66	**150**	0.25	**110**	0.24	37	0.24	0.27
cDCE	0.3 U	0.015 U	0.75 U	0.71	0.79 U	0.013 J	0.59 U	0.028 U	0.032 U
tDCE	0.29 U	0.75	0.49 J	**340**	1.5 J	3.4	0.27 J	3	3.3
1,1-DCE	0.29 U	0.014 U	0.75 U	0.013 J	0.79 U	0.035 U	0.59 U	0.029 U	0.033 U
VC	0.23 U	0.013 U	0.75 U	0.031 U	0.79 U	0.038 U	0.59 U	0.032 U	0.036 U

Area 8 B82 SS and IA Sample 4

	Apr-2019		Jul-2019		Aug-2023			Jan-2024	
Analyte	SS	IA	SS	IA	SS	SS-FD	IA	SS	IA
PCE	0.38 J	0.25	1.6 J	0.053	0.79 J	0.74 U	0.37	0.43	0.29
TCE	11	0.24	7.1	0.027 J	2.2 J	3.5 J	0.026 J	1.1 J	0.14
cDCE	0.045 J	0.014 U	0.66 U	0.32	0.83 U	0.74 U	0.032 U	0.79 U	0.041 U
tDCE	0.29 U	0.53	0.66 U	**180**	1.6 J	0.36 J	2.6	3.1	3.1
1,1-DCE	0.75 J	0.013 U	0.66 U	0.03 U	0.83 U	0.74 U	0.033 U	0.79 U	0.79 U
VC	0.22 U	0.012 U	0.66 U	0.03 U	0.83 U	0.74 U	0.036 U	0.79 U	0.79 U

Area 8 B82 SS and IA Sample 5

	Apr-2019		Jul-2019		Aug-2023		Jan-2024	
Analyte	SS	IA	SS	IA	SS	IA	SS	IA
PCE	0.82 J	0.13	71	0.048	1.2 J	0.29	0.64 J	0.21
TCE	3.5	0.49	29	0.18	6.2	0.21	8.2	0.19
cDCE	0.32 U	0.014 U	1.8 J	0.56	0.65 U	0.033 U	0.75 U	0.033 U
tDCE	0.32 U	0.47	0.68 U	**330**	0.42 J	3.7	0.45 J	3.3
1,1-DCE	0.32 U	0.014 U	1.1 J	0.031 U	0.65 U	0.035 U	0.75 U	0.035 U
VC	0.25 U	0.012 U	0.68 U	0.031 U	0.65 U	0.038 U	0.75 U	0.038 U

Area 8 B82 SS and IA Sample 1

	Apr-2019			Jul-2019				Aug-2023		Jan-2024		
Analyte	SS	SS-FD	IA	SS	SS-FD	IA	IA-FD	SS	IA	SS	SS-FD	IA
PCE	410	300 J	3.6	400	480	0.26	0.25	210	23	290 J	140 J	12
TCE	**3,600**	**3,500**	1.3	**3,300 J**	**4,400 J**	0.17	0.17	**4,000**	0.25	**3700 J**	**1800 J**	0.42
cDCE	0.62 J	0.62 J	0.013 U	3.4 U	2.8 U	0.056	0.057	7.7 U	0.033 U	6.6 U	3.2 U	0.015 J
tDCE	51	53	0.53	34	39	33	36	21 J	0.97	19 J	10 J	6.3
1,1-DCE	7	6.8	0.012 U	3.4 U	1.7 J	0.033 U	0.027 U	7.7 U	0.034 U	4.3 J	1.8 J	0.033 U
VC	0.22 U	0.23 U	0.011 U	3.4 U	2.8 U	0.033 U	0.027 U	7.7 U	0.037 U	6.6 U	3.2 U	0.036 U

Analyte	Project Action Limits SS	IA
PCE	1,330	40
TCE	66.7	2
cDCE	1,330	40
tDCE	1,330	40
1,1-DCE	6,670	200
VC	93.3	2.8

Explanation

S SUMMA

DATE: 11/25/2024 ANALYST: chiquesl

REV. 0 Figure 04-23_B82_1st_floor_SUMMA_2019_data_v3.mxd APPROVED: MEYER

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Figure 4-23
OU 2 Area 8 Vapor Intrusion Sampling Results - Building 82

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Area 8 B98 SS and IA Sample 12

Analyte	Apr-2019 SS	Apr-2019 IA	Apr-2019 IA-FD	Jul-2019 SS	Jul-2019 IA	Aug-2023 SS	Aug-2023 IA	Jan-2024 SS	Jan-2024 IA
PCE	110	0.38	0.39	150	0.092	24 J-	0.12	74	0.092
TCE	60	0.43	0.45	**74**	0.15	24	0.15	**69**	0.068
cDCE	0.58 J	0.015 J	0.015 J	0.4 J	0.14	0.77 U	0.013 J	0.47 J	0.15
tDCE	21	1.6	1.6	13	**110**	14	8.2	64	**120 D**
1,1-DCE	0.43 U	0.012 U	0.014 U	0.71 U	0.031 U	0.77 U	0.032 U	0.72 U	0.039 U
VC	0.33 U	0.011 U	0.012 U	0.71 U	0.031 U	0.77 U	0.035 U	0.72 U	0.042 U

Area 8 B98 SS and IA Sample 10

Analyte	Apr-2019 SS	Apr-2019 IA	Apr-2019 IA-FD	Jul-2019 SS	Jul-2019 IA	Aug-2023 SS	Aug-2023 IA	Jan-2024 SS	Jan-2024 SS-FD	Jan-2024 IA
PCE	**1,900**	2.2	2.1	**2,300**	0.058	**930 J-**	0.034 U	**1,400**	1,300	0.14
TCE	**1,500**	1.1	1.1	**1,700**	0.066	**1,100**	0.018 J	**1,100**	**1,100**	0.23
cDCE	22	0.027 J	0.026 J	21	0.067	19	0.034 U	20	19	0.16
tDCE	31	1.5	1.5	18	30	16	1.3	41	39	**91 D**
1,1-DCE	1.6 U	0.014 J	0.015 J	3.7 U	0.036 U	2.6 U	0.035 U	1.1 J	1.2 J	0.035 U
VC	1.3 U	0.011 U	0.011 U	3.7 U	0.036 U	2.6 U	0.039 U	1.9 U	1.7 U	0.038 U

Area 8 B98 SS and IA Sample 11

Analyte	Apr-2019 SS	Apr-2019 IA	Jul-2019 SS	Jul-2019 IA	Aug-2023 SS	Aug-2023 IA	Jan-2024 SS	Jan-2024 IA
PCE	410	2.1	520	0.041	180 J-	0.028 J	460	0.12
TCE	**1,500**	1.1	**1,600**	0.11	**1,000**	0.031 J	**1,000**	0.2
cDCE	17	0.027 J	16	0.067	16	0.027 J	16	0.12
tDCE	11 J	1.3	9.5 J	25	11	0.93	21	**73 D**
1,1-DCE	1.9 U	0.015 J	3.5 U	0.033 U	1.1 J	0.032 U	1.4 J	0.034 U
VC	1.5 U	0.011 U	3.5 U	0.033 U	1.9 U	0.035 U	1.9 U	0.037 U

Area 8 B98 SS and IA Sample 9

Analyte	Apr-2019 SS	Apr-2019 IA	Jul-2019 SS	Jul-2019 IA	Aug-2023 SS	Aug-2023 IA	Jan-2024 SS	Jan-2024 IA
PCE	14	0.15	32	0.042	30 J-	0.027 J	7.5	0.15
TCE	**100**	0.35	**190**	0.065	**380**	0.033 J	**170**	0.29
cDCE	0.42 U	0.014 U	0.65 U	0.043	1.2 J	0.029 U	1.2 J	0.22
tDCE	6.7	0.91	6.2	22	11	1.3	34	**140 D**
1,1-DCE	0.41 U	0.013 U	0.65 U	0.031 U	0.77 U	0.03 U	0.76 U	0.035 U
VC	0.32 U	0.012 U	0.65 U	0.031 U	0.77 U	0.033 U	0.76 U	0.038 U

Area 8 B98 SS and IA Sample 7

Analyte	Apr-2019 SS	Apr-2019 IA	Jul-2019 SS	Jul-2019 IA	Aug-2023 SS	Aug-2023 IA	Jan-2024 SS	Jan-2024 IA
PCE	82	0.59	72	0.079	2.8	0.027 J+	110	0.042
TCE	**500**	0.54	**280**	0.16	33	0.034 J+	**170**	0.064
cDCE	1.6 J	0.021 J	0.66 J	0.82	0.79 U	0.026 U	1.5 J	0.06 J
tDCE	47	1.7	45	**310**	4.1	0.46 J+	24	**18**
1,1-DCE	0.7 U	0.012 U	0.66 U	0.03 U	0.79 U	0.028 U	2.3 J	0.034 U
VC	0.54 U	0.011 U	0.66 U	0.03 U	0.79 U	0.03 U	0.76 U	0.037 U

Area 8 B98 SS and IA Sample 8

Analyte	Apr-2019 SS	Apr-2019 IA	Jul-2019 SS	Jul-2019 IA	Aug-2023 SS	Aug-2023 IA	Jan-2024 SS	Jan-2024 IA
PCE	350	0.13	430	0.21	150 J-	0.025 J	220	0.11
TCE	**1,000**	0.26	**970**	0.12	**560**	0.016 J	**530**	0.19
cDCE	200	0.033 J	220	0.031 J	130	0.032 U	110	0.12
tDCE	9	0.71	8.3	13	6.4	3.2	12	**72 D**
1,1-DCE	1.2 U	0.014 U	0.65 U	0.032 U	1.5 U	0.034 U	0.87 U	0.036 U
VC	0.95 U	0.012 U	0.65 U	0.032 U	1.5 U	0.037 U	0.87 U	0.04 U

Area 8 B98 SS and IA Sample 4

Analyte	Apr-2019 SS	Apr-2019 IA	Jul-2019 SS	Jul-2019 IA	Aug-2023 SS	Aug-2023 IA	Jan-2024 SS	Jan-2024 IA
PCE	2.6 J	0.84	4	0.039 J	1.2 J	0.044	5.8	0.097
TCE	**150**	0.69	**170**	0.061	**77**	0.081	**110**	0.18
cDCE	0.44 U	0.027 J	0.65 U	0.021 J	0.88 U	0.03 U	0.7 U	0.1
tDCE	16	2.2	5.3	7.7	1.4 J	0.95	29	**62 D**
1,1-DCE	0.43 U	0.015 J	0.65 U	0.035 U	0.88 U	0.032 U	0.7 U	0.031 U
VC	0.33 U	0.011 U	0.65 U	0.035 U	0.88 U	0.035 U	0.7 U	0.034 U

Area 8 B98 SS and IA Sample 5

Analyte	Apr-2019 SS	Apr-2019 IA	Jul-2019 SS	Jul-2019 IA	Aug-2023 SS	Aug-2023 IA	Jan-2024 SS	Jan-2024 IA
PCE	11	0.95	6.4	1	15 U	0.084	35	0.74
TCE	31	0.88	17	0.15	14 U	0.22	34	0.36
cDCE	0.46 U	0.014 U	0.68 U	0.031 J	15 U	0.032 U	0.62 U	0.051
tDCE	1.1 J	0.89	1.5 J	13	15 U	0.6	7	32
1,1-DCE	0.45 U	0.098	0.68 U	0.15	15 U	0.033 U	0.62 U	0.046
VC	0.35 U	0.012 U	0.68 U	0.036 U	15 U	0.036 U	0.62 U	0.042 U

Area 8 B98 SS and IA Sample 6

Analyte	Apr-2019 SS	Apr-2019 IA	Jul-2019 SS	Jul-2019 IA	Aug-2023 SS	Aug-2023 IA	Jan-2024 SS	Jan-2024 IA
PCE	31	0.12	25	0.054	6.1	0.028 J	80	0.04
TCE	18	0.27	15	0.14	6.3	0.03 J	**84**	0.063
cDCE	0.72 U	0.014 U	0.62 U	0.75	0.77 U	0.028 U	0.41 J	0.025 J
tDCE	8.4	1.5	5.5	**280**	1.8 J	0.38	12	18
1,1-DCE	0.71 U	0.013 U	0.62 U	0.031U	0.77 U	0.03 U	0.78 U	0.035 U
VC	0.54 U	0.012 J	0.62 U	0.031U	0.77 U	0.032 U	0.78 U	0.038 U

Area 8 B98 IA Sample 13

Analyte	Apr-2019 IA	Jul-2019 IA	Jul-2019 IA-FD	Aug-2023 IA	Jan-2024 IA
PCE	0.082	0.041	0.042	0.54	0.047
TCE	0.078	0.017 J	0.032 J	0.74	0.058
cDCE	0.33	0.63	0.65	0.8	11
tDCE	**140**	**440**	**480**	**730**	**6,600**
1,1-DCE	0.012 U	0.031 U	0.034 U	0.14	0.42
VC	0.011 U	0.031 U	0.034 U	0.036 U	0.042 U

Area 8 B98 SS and IA Sample 3

Analyte	Apr-2019 SS	Apr-2019 SS-FD	Apr-2019 IA	Jul-2019 SS	Jul-2019 SS-FD	Jul-2019 IA	Aug-2023 SS	Aug-2023 IA	Jan-2024 SS	Jan-2024 IA	Jan-2024 IA-FD
PCE	0.69 U	0.71 U	0.091	1.8 J	1.2 J	0.031 J	0.73 J	0.025 J	2.7	0.89	0.088
TCE	4.3 J	5.8	0.18	16	17	0.024 J	15	0.026 J	16	0.15	0.14
cDCE	0.75 U	0.77 U	0.019 J	0.73 U	0.66 U	0.028 J	0.78 U	0.03 U	0.79 U	1.1	1.1
tDCE	27	25	7.4	7.3	7.7	15	1.5 J	3.5	110	**740 D**	**790 D**
1,1-DCE	0.74 U	0.76 U	0.013 U	0.73 U	0.66 U	0.031 U	0.78 U	0.032 U	0.79 U	0.074	0.082
VC	0.57 U	0.58 U	0.012 U	0.73 U	0.66 U	0.031 U	0.78 U	0.035 U	0.79 U	0.038 U	0.036 U

Area 8 B98 SS and IA Sample 2

Analyte	Apr-2019 SS	Apr-2019 IA	Jul-2019 SS	Jul-2019 IA	Aug-2023 SS	Aug-2023 IA	Jan-2024 SS	Jan-2024 IA
PCE	8.8	0.64	12	0.028 J	6.3	0.024 J	5.3	0.096
TCE	15	0.49	20	0.031 U	11	0.016 J	18	0.17
cDCE	0.43 U	0.021 J	0.68 J	0.031 U	0.76 U	0.032 U	0.87 U	0.12
tDCE	0.92 J	2.2	0.56 J	2.7	0.59 J	0.99	37	**75 D**
1,1-DCE	0.43 U	0.013 U	0.7 U	0.031 U	0.76 U	0.033 U	0.87 U	0.036 U
VC	0.33 U	0.011 U	0.7 U	0.031 U	0.76 U	0.036 U	0.87 U	0.04 U

Area 8 B98 SS and IA Sample 1

Analyte	Apr-2019 SS	Apr-2019 IA	Jul-2019 SS	Jul-2019 IA	Aug-2023 SS	Aug-2023 IA	Jan-2024 SS	Jan-2024 IA
PCE	4.4	0.69	7.1	0.03 J	3.1	0.029 J	12	0.09
TCE	15	0.48	17	0.015 J	9.8	0.033 J	37	0.15
cDCE	1.5 J	0.018 J	0.72 U	0.023 J	0.73 U	0.034 U	0.74 U	0.093
tDCE	1.6 J	0.81	1.2 J	9.5	0.6 J	3.4	16	**66 D**
1,1-DCE	0.41 U	0.012 U	0.72 U	0.031 U	0.73 U	0.036 U	0.74 U	0.033 U
VC	0.31 U	0.011 U	0.72 U	0.031 U	0.73 U	0.039 U	0.74 U	0.036 U

Analyte	Project Action Limits SS	Project Action Limits IA
PCE	1,330	40
TCE	66.7	2
cDCE	1,330	40
tDCE	1,330	40
1,1-DCE	6,670	200
VC	93.3	2.8

Area8-B98-IA-12/SS-12
Area8-B98-IA-10/SS-10
Area8-B98-IA-11/SS-11
FIRST FLOOR
Area8-B98-IA-9/SS-9
Area8-B98-IA-7/SS-7
Area8-B98-IA-8/SS-8
Area8-B98-IA-6/SS-6
Area8-B98-IA-13
Area8-B98-IA-3/SS-3
Area8-B98-IA-4/SS-4
Area8-B98-IA-2/SS-2
Area8-B98-IA-1/SS-1
Area8-B98-IA-5/SS-5
SECOND FLOOR
Area of Detail
0 0.1 0.2 Miles

Explanation

S SUMMA
Former Building
BOLD = Analytical results exceed the Project Action Limit
J = Result detected but marked estimated (see Section 2.6)
U = Undetected at limit of detection

1,1-DCE = 1,1-Dichloroethene
cDCE = cis-1,2-Dichloroethene
tDCE = trans-1,2-Dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl chloride
SS = Sub-slab vapor
IA = Indoor air
All values shown in micrograms per cubic meter (µg/m^3)

DATE: 11/25/2024 *ANALYST: chiquesl*
REV. 1 Figure 04-24_B98_SUMMA_2019_data.mxd *APPROVED: MEYER*

U.S. NAVY

Figure 4-24
OU 2 Area 8 Vapor Intrusion Sampling Results - Building 98

NBK KEYPORT
SIXTH
FIVE-YEAR REVIEW

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Table 4-1. Summary of Concerns and Recommendations from the FYR Interview Questionnaires

No.	Stakeholder	Concerns	Recommendations
1	EPA	OU 1 and OU 2 Area 8 remedies are not achieving remedial action objectives. PFAS and 1,4-dioxane contamination at the sites.	None; satisfied with progress Navy is making to improve OU 1 and OU 2 Area 8 remedies.
2	Suquamish Tribe	OU 1 remedy not functioning. Slow progress hindering Tribal Treaty rights. PFAS contamination at the sites.	Improve the pace of contracting mechanisms so that work can be completed quicker.
3	Ecology	OU 1 remedy is not functioning, and OU 2 sites have data gaps. PFAS has transitioned to a regulated contaminant; and therefore, the remedies may not be protective due to PFAS presence. Investigations are taking considerable time and resources to complete.	None.

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Table 4-2a. Summary of Data Collection During Sixth FYR Period

Activity Date Range	Description	Document Reported In
Operable Unit 1		
2014-August 2023	RI data collection and interpretation supporting Supplemental RI Volume 1 (See Table 4-2b and 4-2c for details)	Final Supplemental RI Report, Volume 1 (Navy 2023a)
April-June 2022	HVDPE Pilot Study	Final HVDPE Report (Navy 2023b)
June-October 2021	Risk assessment data collection	Final HHRA/ERA field investigation report (Navy 2024a)
2019	Revised Tidal Lag Study (USGS)	USGS Open File Report (USGS 2019)
June 2019 – May 2020; Sept 2020 – June 2021; July 2021- June 2022; July 2022 – May 2023; June 2023 - May 2024	Annual O&M	Annual reports under LTM program (Navy 2020c, 2021a, 2023e, 2023f, 2024d)
Sept 2020; Sept 2021; August 2022; August 2023; August 2024	Annual LUC Inspections	Annual reports under LTM program (Navy 2020b, 2022a, 2023d, 2024c, 2025)
December 2021	Sampling of wells for PFAS	Final 2021 GW monitoring report, OU 1 (Navy 2023c)
Aug 2022 – Sept 2023	Supplemental well sampling and ISM sediment sampling	Final Supplemental Sampling Report, OU 1 (Navy 2024b)
January-April, July 2024	2024 well sampling	Report pending
Operable Unit 2, Area 2		
Summer 2022	Installation and sampling of new wells	Soil and groundwater supplemental investigation report (Navy 2023g)
Spring 2023	Sampling of new and existing wells	Interim LTM report (Navy 2024e)
Sept 2020; Sept 2021; August 2022; August 2023; August 2024	Annual LUC inspections	Annual reports under LTM program (Navy 2020b, 2022a, 2023d, 2024c, Report pending)
January-April, July 2024	2024 well sampling	Report pending
Operable Unit 2, Area 8		
Sept 2020; Sept 2021; August 2022; August 2023; August 2024	Annual LUC Inspections and vapor intrusion inspections	Annual reports under LTM program (Navy 2020b, 2022a, 2023d, 2024c, Report pending)
August 2023 and January 2024	Vapor intrusion sampling	Final report for sampling required every five (5) years (Navy 2024g)
2024	Bench study	Bench-scale study report (Navy 2024f)
Ongoing	Work in progress towards supplemental RI	Report pending
2024	2024 seep sampling	Report pending

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Table 4-2b. Summary of OU 1 Site Recharacterization Activities 2014 – 2019

Activity Date Range	Description of Activities by OU 1 Area		
	South Plantation Area	**Central Landfill Area**	**Northern Landfill Area and Offsite**
August 2014	Sampling Program: Collect 231 core samples from 212 trees within the South Plantation Collect 21 core samples from 19 trees south and southwest of the South Plantation Land Surveying Geophysical Surveying	Sampling Program: Collect 5 core samples from 4 trees near well MW1-17 (Central Landfill) Geophysical Surveying	Sampling Program: Collect 10 core samples from 10 trees within the North Plantation
	Additional/Prior Data Evaluation: Groundwater sampling results from wells sampled under the Navy LTM program (MW1-4, MW1-5, MW1-16, and MW1-17) in June 2014 Groundwater sampling results from USGS biodegradation study, including from piezometers (P1-6, P1-7, P1-8, P1-9, and P1-10) in June 2014 and passive diffusion bag (peeper) samplers (S-2, S-2B, S-3, S-3B, S-4, S-4B, S-5, S-5B, and S-6) in September 2014	Additional/Prior Data Evaluation: Groundwater sampling results from wells sampled under the Navy LTM program (MW1-17)	Additional/Prior Data Evaluation: None (tree core sampling only)
August/September 2016	Sampling Program: Install 61 membrane interface probe (MIP) borings Collect 6 soil gas samples at locations east of the South Plantation (SV-01, SV-02, SV-03, SV-04, SV-05, and SV-06)	Sampling Program: Install 8 MIP borings	Sampling Program: Collect 3 soil gas samples at locations east of the North Plantation (SV-11, SV-12, SV-13)
July – November 2017	Sampling Program: Collect soil and grab groundwater samples (target VOCs) from 34 direct-push soil borings Collect subset of samples to be analyzed for: full list VOCs, SVOCs, TPH, and PCB Aroclors Collect soil samples (target VOCs) from 10 auger borings in the South Plantation, and from one (1) boring west of the South Plantation Soil samples collected from screened intervals of wells in apparent hotspots also analyzed for physical characteristics (i.e. grain size, dry bulk density, hydraulic conductivity, effective porosity, and TOC) Install 11 new groundwater monitoring wells and collect groundwater samples (target VOCs) from these wells Wells in apparent hotspots also analyzed for microbial population, PFAS, and 1,4-dioxane Collect water sample from irrigation well, IW1-S Collect 2 stormwater samples (target VOCs) from an outfall and manhole structure within South Plantation Collect 4 push-point porewater samples (target VOCs) from south of the South Plantation Collect 12 surface water samples (target VOCs) from waterways upstream of existing sampling station MA 12 Surveyed horizontal locations and top of casing elevations for newly installed wells and peeper sampling tubes. Collected depth-to-water measurements in new wells, subset of historical wells, and peeper tubes to prepare groundwater elevation contour map	Sampling Program: Collect soil and grab groundwater samples (target VOCs) from 41 direct-push soil borings Collect subset of samples to be analyzed for: full list VOCs, SVOCs, TPH, and PCB Aroclors Collect soil samples (target VOCs) from 7 auger borings in the Central Landfill area Soil samples collected from screened intervals of wells in apparent hotspots also analyzed for physical characteristics (i.e. grain size, dry bulk density, hydraulic conductivity, effective porosity, and TOC) Install 7 new groundwater monitoring wells and collect groundwater samples (target VOCs) from these wells. Wells in apparent hotspots also analyzed for microbial population, PFAS, and 1,4-dioxane Collect 6 push point porewater samples (target VOCs) from west of the Central Landfill area Surveyed horizontal locations and top of casing elevations for newly installed wells and peeper sampling tubes. Collected depth-to-water measurements in new wells and subset of historical wells to prepare groundwater elevation contour map	Sampling Program: Collect 6 sediment samples for PCB congeners and PCB Aroclors at locations north of the North Plantation Utilized passive samplers (polyethylene devices [PEDs]) to collect groundwater samples for total dissolved PCBs at two (2) monitoring wells (MW1-2 and MW1-14) and two (2) piezometers (P1-1 and P1-2) Utilized PEDs to collect six (6) porewater and four (4) surface water samples for total dissolved PCBs at locations north of the North Plantation (Marsh Creek and tide flats area) Surveyed horizontal locations and top of casing elevations for newly installed wells and peeper sampling tubes. Collected depth-to-water measurements in subset of historical wells to prepare groundwater elevation contour map
June – October 2019	Sampling Program: Direct-push soil borings were drilled at four (4) locations in the South Plantation to investigate the lateral extent of cVOC COCs to the east, southeast, and northeast of the South Plantation, to confirm the apparently lower concentrations between the South Plantation and Central Landfill, and better define the depth to the regional aquitard in the center and western edge of the South Plantation. A total of 11 soil samples and 8 grab groundwater samples were collected from these borings and analyzed for the target VOCs, consisting of the nine (9) cVOC COCs identified in the OU 1 ROD and chloroethane. Using sonic drilling, 3 monitoring wells, 2 borings for soil and grab groundwater sampling, and 2 exploratory borings were installed within in the South Plantation. A total of 9 soil samples and 4 grab groundwater samples were collected from these borings and analyzed for the target VOCs, with a subset of the soil samples analyzed for TOC. A total of 18 groundwater samples were collected from newly installed monitoring wells and a subset of pre-existing monitoring wells within the South Plantation. All of these groundwater samples were analyzed for the target VOCs. Wells located in apparent hotspots that were expected to be the focus of potential future remedial action were additionally analyzed for microbial population, PFAS, PCBs, TPH-diesel, 1,4-dioxane,	Sampling Program: Direct-push soil borings were drilled and sampled at 13 locations in the Central Landfill to investigate the lateral extent of cVOC COCs and 1,4-dixoane from the Central Landfill hotspots, to assess TOC concentrations in soil from areas with relatively low concentration of VOCs, and to assess the depth to the regional aquitard along the western and eastern side of the Central Landfill. A total of 40 soil samples and 26 grab groundwater samples were collected from these borings and analyzed for the target VOCs and 1,4-dioxane. A total of eight (8) surface water samples were collected. Five (5) surface water samples were collected from Marsh Pond and from surface water downstream of Marsh Pond, and analyzed for target VOCs. Three (3) surface water samples were collected from areas near Seep SP1-1 and analyzed for PCB congeners. Using sonic drilling, 1 monitoring well, 3 borings for soil and grab groundwater sampling, and 1 exploratory boring were installed within in the Central Landfill. A total of 10 soil samples and 6 grab groundwater samples were collected from these borings and analyzed for the target VOCs, with a subset of the soil samples analyzed for TOC.	Sampling Program: Direct-push soil borings were drilled and sampled at 16 locations in the North Plantation to investigate the distribution of VOCs beneath the North Plantation (assuming groundwater transport to the northwest from Central Landfill hotspots), to assess the migration of 1,4-dioxane from the Central Landfill hotspots beneath the North Plantation, to investigate a potential PCB source area, to assess TOC concentrations in soil from areas with relatively low concentration of VOCs, and to assess the depth to the regional aquitard along the eastern side of the Central Landfill A total of 53 soil samples and 33 grab groundwater samples were collected from these borings samples were analyzed for the target VOC, 1,4-dioxane, PCB Aroclors, TPH-diesel, and/or TOC (soil only) Using sonic drilling, 5 monitoring wells were installed within in the North Plantation. A total of 8 soil samples were collected from these borings and analyzed for the target VOCs, with a subset of the soil samples analyzed for

Table 4-2b (continued). Summary of OU 1 Site Recharacterization Activities 2014 – 2019

Activity Date Range	Description of Activities by OU 1 Area		
	South Plantation Area	**Central Landfill Area**	**Northern Landfill Area and Offsite**
	and biodegradation parameters (i.e., methane, ethane, nitrate, nitrite, sulfate, chloride, dissolved organic carbon, and sulfide). A total of eight (8) porewater samples were collected in June 2019. These samples were collected from south of the South Plantation and were analyzed for the target VOCs. A total of three (3) porewater samples were collected in October 2019. These samples were collected from west/southwest of the South Plantation and were analyzed for the target VOCs. To update the CSM, the majority of the sonic borings in all areas of the site were advanced to greater depths than in previous investigations. The soil cores were continuously logged from these locations to identify the upper contact of the regional aquitard within the site boundary.	A total of 9 groundwater samples were collected from newly installed monitoring wells and a subset of pre-existing monitoring wells within the Central Landfill. All of these groundwater samples were analyzed for the target VOCs. Wells located in apparent hotspots that were expected to be the focus of potential future remedial action were additionally analyzed for microbial population, PFAS, PCBs, TPH-diesel, 1,4-dioxane, and biodegradation parameters (i.e., methane, ethane, nitrate, nitrite, sulfate, chloride, dissolved organic carbon, and sulfide).	PCB congeners and TPH as diesel. No grab groundwater samples were collected from these borings. A total of 7 groundwater samples were collected from newly installed monitoring wells and a subset of pre-existing monitoring wells within the North Plantation. All of these groundwater samples were analyzed for the target VOCs. Wells located in apparent hotspots that were expected to be the focus of potential future remedial action were additionally analyzed for microbial population, PFAS, PCBs, TPH-diesel, 1,4-dioxane, and biodegradation parameters (i.e., methane, ethane, nitrate, nitrite, sulfate, chloride, dissolved organic carbon, and sulfide). A total of eight (8) porewater samples were collected in June 2019. Three (3) of these samples were collected from northwest of the North Plantation and were analyzed for PCB congeners; five (5) of these samples were collected from west of the North Plantation, downstream of Marsh Pond, and were analyzed for the target VOCs. A total of seven (7) sediment samples were collected at, or in the vicinity of, historical sediment sample locations. These samples were collected for PCB congeners and PCB Aroclors.

Table 4-2c. Summary of OU 1 Site Recharacterization Activities 2021 - 2023

Activity Date Range	Description of Activities Across OU 1
January and June 2021	• Geophysical investigation of the wetlands adjacent to the landfill, the tide flats, and Dogfish Bay. Temporal, intertidal electrical resistance tomography used to assess the freshwater saltwater interface, preferential flow pathways, and strategy. • Direct-push soil core sampling to 6 feet bgs at 29 locations north of the North Plantation on the landfill footprint to collect chemical of interest concentration data in support of the HHRA/ERA addendum. • Wetland sediment sampling near and downstream of seep SP1-1 using incremental sampling methodology to establish repeatable baseline PCB concentrations for decision units along the freshwater stream bed.
December 2021	Collection and laboratory analysis for PFAS from 54 groundwater monitoring wells located across OU 1, to inform future PFAS RI[1].
April-July 2022	Deep well install and sampling: • Five (5) deep wells were installed within the landfill footprint, and two (2) deep wells were installed on the Highway 308 causeway using sonic drilling • Sampling of the newly installed wells Slug testing: • Rising and falling head slug tests in 15 wells
August 2023	Publication of OU-wide supplemental RI Vol 1: • Integration and interpretation of data collected since 2014 • Biodegradation assessment • Environmental sequence stratigraphy analysis • Remchlor MD Groundwater modeling • Revised conceptual site model
August 2022 Sept 2023	Supplemental well sampling and sediment sampling under the LTM program in support of the overall supplemental remedial investigation • Collection and laboratory cVOC analysis of groundwater samples from 24 wells in the South Plantation area where HVDPE pilot testing was performed at timeframes of 1 month, 3 months, and 6 months after shutdown of the HVDPE system • Collection and laboratory cVOC analysis of porewater and surface water samples at 10 and six (6) locations, respectively, in the South Plantation area where HVDPE pilot testing was performed, coincident with the groundwater sampling events. • Collection and laboratory analysis (cVOCs, 1,4-dioxane, PFAS[1], PAHs, metals and PCB Aroclors) at four (4) groundwater monitoring wells located on the Highway 308 causeway. • Collection and laboratory analysis (PCB congeners and TOC) of ISM sediment samples from eight (8) decision units at and downstream of seep SP1-1.
Ongoing	Risk assessment data collection and HHRA/ERA addendum • Risk assessment data from 2021 sample collection were published in a final HHRA/ERA field investigation report dated May 2024 ○ Data collection from 7 of 10 exposure areas defined in the QAPP (unacceptable risks to human health are already documented for the remaining 3 exposure areas) ○ Sampling of soil and plant tissue in terrestrial areas, and sampling of surface water, sediment, shellfish tissue, and plant tissue in aquatic areas and reference areas ○ Laboratory analysis of soil samples for PCB Aroclors; PCB congeners; metals (including Cr(VI)); PAHs; cVOCs; PFAS[1]; dioxins/furans (DF); BTEX; TPH; TPH-gasoline; TPH-diesel; total solids (TS); and TOC. ○ Laboratory analysis of sediment samples for PCB Aroclors, PCB congeners, metals (including chromium VI), PAHs, cVOCs, PFAS[1], DF, BTEX, ammonia, TS, TOC, grain size or particle size, and sulfides. ○ Laboratory analysis of surface water samples for PCB Aroclors, PCB congeners, dissolved metals, PAHs, cVOCs, PFAS[1], DF, BTEX, ammonia, DOC, and sulfides. ○ Laboratory analysis of shellfish tissue samples for PCB congeners, metals (including speciated arsenic and methyl mercury), PAHs, DF, lipids, and percent moisture. ○ Laboratory analysis of plant tissue samples for PCB congeners, metals (including speciated arsenic), PAHs, cVOCs, DF, lipids, and percent moisture. ○ Field measurement of surface water for conductivity, pH, temperature, DO, and ORP. • HHRA/ERA addendum report (Volume 2 of the supplemental RI) is published for comment as a draft Offsite supplemental RI beneath Dogfish Bay is in progress and includes: • Geophysics • Drilling • Grab soil and grab groundwater sample collection from borings and groundwater sample collection from new monitoring wells. • Laboratory analysis of soil and groundwater samples for VOCs, 1,4-dioxane, PAHs, PCB Aroclors, mercury, and metals.

Notes:

[1] – PFAS has been analyzed in samples collected during supplemental investigations conducted during this FYR period to allow consideration of potential impacts of this confounding co-contaminant on decisions regarding legacy contaminants. However, PFAS is being comprehensively assessed at NBK Keyport under a separate CERCLA process.

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Table 4-3a. Pre- and Post-Pilot Test Groundwater Sampling Analytical Data

Analyte			*cis*-1,2-Dichloroethene		Trichloroethene		Vinyl chloride		Total: TCE, cis-1,2-DCE, VC	Pre-Test to 6-Month Post-Test Reduction % of TCE, cis-1,2-DCE, VC Total	Observations/Trends/ Patterns
Unit			µg/L		µg/L		µg/L		µg/L		
PAL			16		0.30		0.020		--		
Location	Sample ID	Sample Date	Result	Q	Result	Q	Result	Q	Result		
MW1-04	AREA-1-19-203	6/19/2019	580		680		34		1294	52%	50% decrease, decrease stayed constant during 6-month period
	PT1-MW1-04	8/22/2022	140		520		6.6	J	667		
	PT1-MW1-04-A (Dup)	8/22/2022	100		460		2.3	J	562		
	PT3-MW1-04	10/25/2022	250		270		8.6	J	529		
	PT3-MW1-04-A (Dup)	10/25/2022	240		260		8.2	J	508		
	PT6-MW1-04	1/23/2023	320		290		5.2	J	615		
	PT6-MW1-04-A (Dup)	1/23/2023	330		290		5.2	J	625		
MW1-20	MW1-20	6/19/2017	0.5	U	0.5	U	0.5	U	ND	ND	Non-detect before and after test
	PT1-MW1-20	8/24/2022	0.80	UJ	0.31	J-	0.50	U	0.31		
	PT3-MW1-20	10/26/2022	0.15	U	0.15	U	0.015	U	ND		
	PT6-MW1-20	1/23/2023	0.15	U	0.15	U	0.090	U	ND		
MW1-49	MW1-49-191022	10/22/2019	1,300	J	940	J	100	J	2340	75%	Steady decline post-test
	FD-191022-01 (Dup)	10/22/2019	1,300	J	990	J	84	J	2374		
	PT1-MW1-49	8/24/2022	1,200	J-	760	J-	120	J-	2080		
	PT3-MW1-49	10/26/2022	810	J-	750	J-	61	J-	1621		
	PT6-MW1-49	1/23/2023	390		120		75	J	585		
MW1-50	MW1-50-191023	10/23/2019	400		420		27	J	847	-251%	Steady decline through 3-month post-test, then sharp increase at 6-month sampling to >3x pre-test levels
	PT1-MW1-50	8/22/2022	120		120		13		253		
	PT3-MW1-50	10/25/2022	100		98		6.6		205		
	PT6-MW1-50	1/23/2023	1,500		1,400		71		2971		
MW1-52	MW1-52-191021	10/21/2019	510	J	0.30	U	120		630	62%	>50% decrease, decrease stayed relatively constant during 6-month period, with slight rebound at 6-month sampling
	PT1-MW1-52	8/22/2022	150		0.44	J-	59		209		
	PT1-MW1-52-A (Dup)	8/22/2022	140	J-	0.33	J-	58		198		
	PT3-MW1-52	10/26/2022	130		0.39	J	49	J	179		
	PT3-MW1-52-A (Dup)	10/26/2022	170	J-	0.40	J-	110	J	280		
	PT6-MW1-52	1/23/2023	190		3.4	J	49		242		
	PT6-MW1-52-A (Dup)	1/23/2023	200		7.5		53		261		
MW1-53	MW1-53-191023	10/23/2019	760	J	130	J	220	J	1110	21%	Almost 50% decrease, then steady rebound over 6 month period to 20% overall decrease
	PT1-MW1-53	8/22/2022	340		51		250		641		
	PT3-MW1-53	10/25/2022	470	J-	60		170	J-	700		
	PT6-MW1-53	1/23/2023	620		82		180		882		
MW1-54	MW1-54-191021	10/21/2019	0.30	UJ	0.30	UJ	0.015	U	ND	ND	Non-detect before and after test
	PT1-MW1-54	8/22/2022	0.15	U	0.15	U	0.015	U	ND		
	PT3-MW1-54	10/26/2022	0.15	U	0.15	U	0.015	U	ND		
	PT6-MW1-54	1/25/2023	0.15	U	0.15	U	0.09	U	ND		
MW1-55	MW1-55-191024	10/24/2019	130	J	3.1		24	J	157	96%	Sharp decrease that stayed constant during 6 month period
	PT1-MW1-55	8/23/2022	10		1.5	J-	0.5	J	12		
	PT3-MW1-55	10/26/2022	22		2.4		1.2		26		
	PT6-MW1-55	1/23/2023	5.4		0.84		0.26		6.50		
MW1-56-1	MW1-56-12-191023	10/23/2019	200,000	J	170,000	J	890	J	370890	49%	>50% decrease, then steady rebound over 6 month period to 49% overall decrease
	PT1-MW1-56-1	8/23/2022	27,000	J-	120,000	J-	250	J-	147250		
	PT3-MW1-56-1	10/26/2022	35,000		140,000		300	J	175300		
	PT6-MW1-56-1	1/25/2023	48,000		140,000	J-	410	J	188410		
MW1-56-2	MW1-56-24-191023	10/23/2019	71,000	J	590,000	J	72	J	661072	79%	>80% decrease, then rebounded slightly at 3-month period
	PT1-MW1-56-2	8/23/2022	41,000	J-	75,000	J-	500	UJ	116000		
	PT3-MW1-56-2	10/26/2022	73,000		81,000		370	J	154370		
	PT6-MW1-56-2	1/25/2023	68,000		72,000		570	J	140570		
MW1-57-0	MW1-57-32-191022	10/22/2019	1,800	J	4600	J	230	J	6630	48%	>75% decrease, then anomalous spike (to 6x pre-levels) at 3-month,
	PT1-MW1-57-0	8/22/2022	750		630		170		1550		
	PT3-MW1-57-0	10/25/2022	18,000	J-	22,000	J-	150		40150		

Table 4-3a (continued). Pre- and Post-Pilot Test Groundwater Sampling Analytical Data

Analyte			*cis*-1,2-Dichloroethene		Trichloroethene		Vinyl chloride		Total: TCE, cis-1,2-DCE, VC	Pre-Test to 6-Month Post-Test Reduction % of TCE, cis-1,2-DCE, VC Total	Observations/Trends/ Patterns
Unit			µg/L		µg/L		µg/L		µg/L		
PAL			16		0.30		0.020		--		
Location	Sample ID	Sample Date	Result	Q	Result	Q	Result	Q	Result		
	PT6-MW1-57-0	1/25/2023	860		2,400		200	J	3460		followed by decrease at 6-month period
MW1-57-1	MW1-57-16-191022	10/22/2019	130,000	J	230,000	J	200	J	360200	62%	>70% decrease, then steady rebound over 6 month period to 62% overall decrease
	PT1-MW1-57-1	8/23/2022	63,000	J-	33,000	J-	19	J	96019		
	PT3-MW1-57-1	10/25/2022	120,000	J-	4,500		28	J	124528		
	PT6-MW1-57-1	1/25/2023	130,000		7,700		300	J	138000		
MW1-57-2	MW1-57-10-191022	10/22/2019	260,000	J	250,000	J	8,700		518700	55%	>75% decrease, then steady rebound over 6 month period to 55% overall decrease
	PT1-MW1-57-2	8/23/2022	16,000	J-	100,000	J-	67	J-	116067		
	PT3-MW1-57-2	10/25/2022	60,000	J-	61,000	J-	30	J	121030		
	PT6-MW1-57-2	1/25/2023	110,000	J-	120,000	J-	3,300		233300		
MW1-58-0	MW1-58-39.5-191024	10/24/2019	2.1	J	0.30	UJ	5.2	J	7.30	--	--
MW1-58-1	MW1-58-9-191024	10/24/2019	6,900		370		19,000	J	26270	-89%	Sharp decline between 1-month and 3-month periods, then sharp increase to almost 2x pre-test levels
	PT1-MW1-58-1	8/22/2022	6,600		13,000		770		20370		
	PT3-MW1-58-1	10/25/2022	85	J-	1,200		300		1585		
	PT6-MW1-58-1	1/25/2023	39,000	J-	4,700		5,900	J-	49600		
MW1-58-2	MW1-58-19-191024	10/24/2019	3.1		0.30	U	9.1		12	-65%	Starts low, order of magnitude increase at 1-month, then decline back to near pre-test level
	PT1-MW1-58-2	8/22/2022	96		97		50		243		
	PT3-MW1-58-2	10/25/2022	46	J-	13	J-	25		84		
	PT6-MW1-58-2	1/25/2023	13		1.6		5.5		20		
MW1-61	MW1-61-191028	10/28/2019	13		0.30	U	61		74	46%	Starts low, order of magnitude increase at 1-month, then decline back to near pre-test level
	PT1-MW1-61	8/22/2022	17	J	15	U	150		167		
	PT3-MW1-61	10/26/2022	20	J-	0.26	J-	84	J-	104		
	PT6-MW1-61	1/23/2023	11		3.3	J	26		40		
MW1-66	MW1-66-191024	10/24/2019	96,000	J	280,000	J	2,200	J	378200	68%	80% decrease at 3-month period, then rebound at 6 month period to 68% overall decrease
	PT1-MW1-66	8/23/2022	63,000	J-	35,000	J-	120		98120		
	PT3-MW1-66	10/25/2022	74,000	J-	290		280		74570		
	PT6-MW1-66	1/25/2023	45,000		73,000	J-	2,400	J-	120400		
MW1-68	MW1-68-191028	10/28/2019	3.4		35		0.062		38	98%	Decrease to ND at 1-month, then stays low (<1 ug/L) through 6-month
	PT1-MW1-68	8/23/2022	0.80	UJ	0.50	UJ	0.50	U	ND		
	PT3-MW1-68	10/26/2022	0.15	U	0.11	J	0.043		0.15		
	PT6-MW1-68	1/25/2023	0.43		0.32		0.090	U	0.75		
MW1-76	MW1-76-220429	4/29/2022	8,820		4,280		924		14024	92%	>99% decrease at 3-month period, then rebound at 6 month period to 92% overall decrease
	PT1-MW1-76	8/22/2022	110	J-	100	J-	16		226		
	PT3-MW1-76	10/25/2022	26	J-	29		3.7	J-	59		
	PT6-MW1-76	1/23/2023	640		350		89		1079		
MW1-77	MW1-77-220429	4/29/2022	581		42.5		130		754	32% (only 1-month post-test collected)	Only 1-month post-test sample collected, 32% reduction observed
	FD-220429-01 (Dup)	4/29/2022	571		47.4		136		754		
	PT1-MW1-77	8/23/2022	310	J-	65	J-	140	J-	515		
P1-6	PT1-P1-06	8/22/2023	4,300	J-	1,300	J-	510	J-	6110	88% (no pre-test results; reduction % from 1-month to 6-month post-test)	No pre-test data, but steady decline from 1-month to 6-month periods is observed
	PT3-P1-06	10/25/2022	2,200	J-	950	J-	280	J-	3430		
	PT6-P1-06	1/25/2023	370		17	J	320		707		
P1-7	PT1-P1-07	8/22/2022	460		680		43		1183	-983% (no pre-test results; reduction % from 1-month to 6-month post-test)	No pre-test data, but initial decline is followed by sharp increase to >10x 1-month levels
	PT3-P1-07	10/25/2022	270		360		17		647		
	PT6-P1-07	1/23/2023	7,000	J-	5,300	J-	510		12810		
P1-10	PT1-P1-10	8/22/2022	300		45		92		437	-1440% (no pre-test results; reduction % from 1-month to 6-month post-test)	No pre-test data, but initial decline is followed by sharp increase to >15x 1-month levels
	PT3-P1-10	10/26/2022	200		30		67	J	297		
	PT6-P1-10	1/25/2023	4,000	J-	2,100	J-	630	J-	6730		

Notes:

Detected results exceeding the Project Action Level are boldfaced and shaded grey.

Limits of detection for non-detected results exceeding the Project Action Level are shaded grey.

Sample collected by Sealaska Environmental or Battelle before the pilot test.

ND = Non-detect

Table 4-3a (continued). Pre- and Post-Pilot Test Groundwater Sampling Analytical Data

PAL = Project Action Level
µg/L = microgram(s) per liter
(Dup) = field duplicate
Data Qualifiers:
J = The reported result is an estimated value.
J- = The reported result is an estimated value with a low bias.
Q = Data validation qualifier
R = The result is rejected.
U = The analyte is not detected at the associated limit of detection.
UJ = The analyte is not detected; the associated limit of detection is approximate.

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Table 4-3b. Pre- and Post-Pilot Test Porewater Sampling Analytical Data

Analyte			cis-1,2-Dichloroethene		Trichloroethene		Vinyl chloride		Total: TCE, cis-1,2-DCE, VC	Pre-Test to 6-Month Post-Test Reduction % of TCE, cis-1,2-DCE, VC Total	Observations/Trends/Patterns
Unit			µg/L		µg/L		µg/L		µg/L		
PAL			200		0.30		0.020		--		
Location	Sample ID	Sample Date	Result	Q	Result	Q	Result	Q	Result		
PW1-2	PW1-02-170907	9/7/2017	1,000	J	10.9	JD	408	J	1419	99%	Significant reduction through 3-month, no rebound at 6-month
	FD-170907-01 (Dup)	9/7/2017	1,160	D	34.9	D	415	D	1610		
	PT1-PW1-2	8/23/2022	11.0	J-	0.5	UJ	150.0	J-	161		
	PT1-PW1-2-A (Dup)	8/23/2022		R		R	150.0		150		
	PT3-PW1-2	10/24/2022	0.4	J	0.5	U	10.0		10		
	PT3-PW1-2-A (Dup)	10/24/2022	0.8	U	0.5	U	11.0		11		
	PT6-PW1-2	1/24/2023	5.5		0.6		7.4		13		
	PT6-PW1-2-A (Dup)	1/24/2023	5.7		0.6		7.7		14		
PW1-10	PW1-10-170908	9/8/2017	555.0	D	15.9	D	182.0	D	753	68%	Significant reduction through 3-month, slight rebound at 6-month
	PT1-PW1-10	8/23/2022	120.0	J-	67.0	J-	120.0		307		
	PT3-PW1-10	10/24/2022	56.0		1.7		8.7		66		
	PT6-PW1-10	1/24/2023	190.0		45.0		5.2	J	240		
PW1-11	PW1-11-190606	6/6/2019	64		0.30	U	26		90	80%	Spike at 1-month, then decline through 6-month
	PT1-PW1-11	8/23/2022	370.0	J-		R	180.0		550		
	PT3-PW1-11	10/24/2022	160.0		5.0	U	48.0		208		
	PT6-PW1-11	1/24/2023	13.0		0.4	J	4.8		18		
PW1-15	PW1-15-190606	6/6/2019	0.30	U	0.30	U	0.015	U	0	--	ND throughout
	PT1-PW1-15	8/23/2022	0.8	UJ	0.5	UJ	0.5	U	0		
	PT3-PW1-15	10/24/2022	0.2	U	0.2	U	0.0	U	0		
	PT6-PW1-15	1/24/2023	0.2	U	0.2	U	0.1	U	0		
PW1-16	PW1-16-190606	6/6/2019	0.30	U	0.30	U	0.015	U	0	--	ND throughout
	PT1-PW1-16	8/23/2022		R		R	2.5	U	0		
	PT3-PW1-16	10/24/2022	0.2	U	0.2	U	0.0	U	0		
PW1-28	PW1-28-190606	6/6/2019	27		0.39	J	7.5		35	--	No post-test samples collected
PW1-29	PW1-29-190606	6/6/2019	52		2.0		11		65	100%	Reduction to ND at 1-month and 3-month, no data at 6-month.
	PT1-PW1-29	8/23/2022		R		R	2.5	U	0		
	PT3-PW1-29	10/24/2022	0.2	U	0.2	U	0.0	U	0		
S-4	S-4	9/4/2014	46000.0		100.0	U	13200.0		59200	99%	Added pre-test data from 2014. Co-located with SW1-10. Significant reduction, then slight rebound from 3-month to 6-month.
	PT1-S-4	8/23/2022	360.0	J-	17.0	J-	740.0		1117		
	PT3-S-4	10/24/2022	31.0		5.0	U	130.0		161		
	PT6-S-4	1/24/2023	280.0		29.0		240.0		549		
S-4B	S-4B	9/4/2014	416.0		1.0	U	191.0		607	88%	Added pre-test data from 2014. Co-located with SW1-09 Significant reduction, then slight rebound from 1-month to 6-month.
	PT1-S-4B	8/23/2022	7.6	J-	13.0	J-	2.6	J	23		
	PT3-S-4B	10/24/2022	8.7		23.0		2.7		34		
	PT6-S-4B	1/24/2023	32.0		16.0		24.0		72		

Table 4-3b (continued). Pre- and Post-Pilot Test Porewater Sampling Analytical Data

Analyte			cis-1,2-Dichloroethene		Trichloroethene		Vinyl chloride		Total: TCE, cis-1,2-DCE, VC	Pre-Test to 6-Month Post-Test Reduction % of TCE, cis-1,2-DCE, VC Total	Observations/Trends/Patterns
Unit			µg/L		µg/L		µg/L		µg/L		
PAL			200		0.30		0.020		--		
Location	Sample ID	Sample Date	Result	Q	Result	Q	Result	Q	Result		
S-5	S-5	9/4/2014	1350.0		6.5		43.7		1400	98%	Added pre-test data from 2014. Significant reduction to ND at 3-month, then slight rebound at 6-month.
	PT1-S-5	8/23/2022	1.4	J-	0.6	J-	1.2		3.2		
	PT3-S-5	10/24/2022	0.2	U	0.2	U	0.0	U	0		
	PT6-S-5	1/24/2023	8.6		3.3		13.0		25		

Notes:
Detected results exceeding the Project Action Level are boldfaced and shaded grey.
Limits of detection for non-detected results exceeding the Project Action Level are shaded grey.
Sample collected by Battelle before the pilot test.
PAL = Project Action Limit
µg/L = microgram(s) per liter
(Dup) = field duplicate
Data Qualifiers:
D = The reported value is from a dilution.
J = The reported result is an estimated value.
J- = The reported result is an estimated value with a low bias.
R = The result is rejected.
U = The analyte is not detected at the associated numerical value.
UJ = The analyte is not detected; the associated numerical value is approximate.

Table 4-3c. Pre- and Post-Pilot Test Surface Water Sampling Analytical Data

Analyte			cis-1,2-Dichloroethene		Trichloroethene		Vinyl chloride		Total: TCE, cis-1,2-DCE, VC	Pre-Test to 6-Month Post-Test Reduction % of TCE, cis-1,2-DCE, VC Total	Observations/Trends/Patterns
Unit			µg/L		µg/L		µg/L		µg/L		
PAL			200		0.30		0.020		--		
Location	Sample ID	Sample Date	Result	Q	Result	Q	Result	Q	Result		
MA12	AREA-1-19-226	6/18/2019	240		15		12		267	73%	Significant reduction, followed by rebound from 1-month to 6-month
	AREA-1-19-227 (Dup)	6/18/2019	230		15		11		256		
	PT1-MA12	8/23/2022	0.4	J-		R	0.5	U	0.44		
	PT1-MA12-A (Dup)	8/23/2022	0.5	J-		R	0.5	U	0.49		
	PT3-MA12	10/24/2022	1.8		0.4		0.9		3.1		
	PT3-MA12A (Dup)	10/24/2022	1.8		0.4		1.4		3.6		
	PT6-MA12	1/24/2023	51.0		6.6		14.0		72		
	PT6-MA12-A (Dup)	1/24/2023	55.0		6.3		13.0		74		
SW1-07	SW1-07-171026	10/26/2017	62.0	D	10.1	D	0.6060	JD	73	-39%	Significant reduction, followed by rebound to >pre-test levels at 6-month ***further away and upstream from all other SW locations
	PT1-SW1-07	8/23/2022		R	1.3	J-	2.5	U	1.3		
	PT3-SW1-07	10/24/2022	0.2	U	0.2	U	0.0	U	0		
	PT6-SW1-07	1/24/2023	77.0		24.0		0.2		101		
SW1-08	SW1-08-171026	10/26/2017	50.5	D	9.18	D	1.0	U	60	94%	Significant reduction at 1-month and 3-month, slight rebound to 3.6 ug/L at 6-month
	PT1-SW1-08	8/23/2022	0.8	UJ	0.5	UJ	0.2	J	0.23		
	PT3-SW1-08	10/24/2022	0.2	U	0.3		0.0	U	0.28		
	PT6-SW1-08	1/24/2023	2.5		1.0		0.1		3.6		
SW1-09	SW1-09-171026	10/26/2017	41.1	D	58.6	D	9.6	D	109	84%	Significant reduction, followed by slight rebound from 1-month to 6-month
	PT1-SW1-09	8/23/2022	2.3	J-	2.1	J-	0.4	J	4.8		
	PT3-SW1-09	10/24/2022	4.7		4.2		2.1		11		
	PT6-SW1-09	1/24/2023	11.0		6.6		0.3		18		
SW1-10	SW1-10-171026	10/26/2017	6640.0	D	25.0	U	4330.0	D	10970	99%	Significant reduction, followed by slight rebound from 3-month to 6-month
	PT1-SW1-10	8/23/2022	79.0	J-		R	140.0		219		
	PT3-SW1-10	10/24/2022	0.8	J	0.4	J	0.7	J	1.9		
	PT6-SW1-10	1/24/2023	49.0		6.0		40.0		95		
SW1-11	SW1-11-171026	10/26/2017	246.0	D	10.3	D	51.8	D	308	70%	Significant reduction, followed by slight rebound from 1-month to 6-month
	PT1-SW1-11	8/23/2022	1.7	J-		R	0.9	J	2.6		
	PT3-SW1-11	10/24/2022	3.7		0.8		2.9		7.4		
	PT6-SW1-11	1/24/2023	67.0		7.5		18.0		93		

Notes:

Detected results exceeding the Project Action Level are boldfaced and shaded grey.

Limits of detection for non-detected results exceeding the Project Action Level are shaded grey.

Sample collected by Sealaska Environmental Services or Battelle before the pilot test.

NS = not sampled

PAL = Project Action Limit

µg/L = microgram(s) per liter

Table 4-3c (continued). Pre- and Post-Pilot Test Surface Water Sampling Analytical Data

(Dup) = field duplicate

Data Qualifiers:

D = The reported value is from a dilution.

J = The reported result is an estimated value.

J- = The reported result is an estimated value with a low bias.

R = The result is rejected.

U = The analyte is not detected at the associated numerical value.

UJ = The analyte is not detected; the associated numerical value is approximate.

Table 4-4. Summary of Annual LUC Inspections at NBK Keyport

Inspector's Checklist	Response (Yes/No)					Findings/Comments
	2020	2021	2022	2023	2024	
OU 1 – Former Landfill[(a)]						
Has access to OU 1 been maintained (have security procedures for base entry served to maintain a restricted access)?	Yes	Yes	Yes	Yes	Yes	–
Have drinking water wells been installed on Navy property within 1,000 feet of the landfill?	No	No	No	No	No	–
For Area A, the land between the tide flats and the marsh, have water wells been installed, except those for monitoring or remedial action purposes?	No	No	No	No	No	–
For Area B, the land between the tide flats and the Pass and ID Building parking lot, have water wells been installed, expect those for monitoring or remedial action purposes?	No	No	No	No	No	–
For Area C, the tide flats and adjacent shoreline owned by the Navy, have any activities occurred that could interfere with or compromise monitoring or remedial actions?	No	No	No	No	No	A new tide gate installed in August 2023. Functioning well with no disruptions since installation.
For Area D, the former landfill, have water wells been installed, expect those for monitoring or remedial action purposes?	No	No	No	No	No	Designated smoking area located in Area D observed in 2021.
For Area D, the former landfill, are any employees permanently assigned to work in buildings within this area?	Yes	No	No	No	No	A construction trailer was parked to the east of the North Plantation on the gravel area in use as materials storage in 2020.
For Area D, the former landfill, have there been any land use activities other than remedial activities, storage, parking, and facilities that involve only occasional occupancy by workers?	No	Yes	Yes	Yes	No	Occasional outdoor motorcycle training course and designated employee smoking area noted in 2022 and 2023. Office trailer parked on LF in 2022 was removed prior to the 2023 inspection.
For Area D, the former landfill, have activities that involve digging and construction within this area been controlled by the base excavation/dig permit procedure and other pertinent base instruction?	Yes	Yes	Yes	N/A	Yes	–
For Area D, the former landfill, is there significant damage (e.g., cracking, seam separation, root damage, etc.) to asphalt surfaces that permits direct-contact exposure of people to underlying soils or that may significantly increase infiltration of surface water/stormwater?	Yes	Yes	Yes	Yes	Yes	Large crack in parking lot (W to E) approx. ½" wide. Cracking ½" wide (N to S) in parking lot observed in 2020. Large cracks throughout parking lot, 1" wide. Root damage causing cracks up to 2" wide observed in 2021. Large cracks throughout parking lot, approx. 1-2" wide observed in 2022. Cracks in asphalt throughout parking lot up to 1" wide and root causing a hole in asphalt observed in 2023. Cracking in pavement in parking lot up to 1" wide and 3" deep, root cracking. No direct-contact exposure to underlying soil from cracks observed in 2024.
For Area D, the former landfill, if activities requiring an excavation/dig permit were conducted, were there any instances in which the permit requirements were not effective in maintaining the requirements of the Institutional Controls Plan?	No	No	No	No	No	–
For Area E, the marsh pond and marsh system, have there been any new construction or maintenance activities that disturbed the wetlands adjacent to the landfill and resulted in an exposure hazard?	No	No	No	No	No	–
For Area E, the marsh pond and marsh system, have there been any new construction or maintenance activities that interfere with or compromise the monitoring or remedial actions for the landfill?	No	No	No	No	No	–
OU 2 Area 2 – Van Meter Road Spill/Drum Storage Area						
Has access to OU 2 Area 2 been maintained (have security procedures for base entry served to maintain a restricted access)?	Yes	Yes	Yes	Yes	Yes	–
Have activities that involved digging and construction within OU 2 Area 2 been controlled by the base excavation/dig permit procedure and other pertinent base instructions?	Yes	Yes	Yes	N/A	Yes	–
If activities requiring an excavation/dig permit were conducted within OU 2 Area 2, were there any instances in which the permit requirements were not effective in maintaining the requirements of the Institutional Controls Plan?	No	No	No	N/A	No	–
Have water wells been installed at OU 2 Area 2, except those for monitoring or remedial actions?	No	No	No	No	No	–
Has residential development occurred in OU 2 Area 2?	No	No	No	No	No	–
OU 2 Area 8 – Plating Shop Waste/Oil Spill Area						
Has access to OU 2 Area 8 been maintained (have security procedures for base entry served to maintain a restricted access)?	Yes	Yes	Yes	Yes	Yes	–

Table 4-4 (continued). Summary of Annual IC Inspections at NBK Keyport

Inspector's Checklist	Response (Yes/No)					Findings/Comments
	2020	2021	2022	2023	2024	
Have activities that involved digging and construction within OU 2 Area 8 been controlled by the base excavation/dig permit procedure and other pertinent base instructions?	Yes	Yes	Yes	Yes	Yes	–
If activities requiring an excavation/dig permit were conducted below the water table within OU 2 Area 8, were there any instances in which the permit requirements were not effective in maintaining the requirements of the Institutional Controls Plan?	No	No	No	No	No	–
Have water wells been installed at OU 2 Area 8, except those for monitoring or remedial actions?	No	No	No	No	No	–
Has residential development occurred in OU 2 Area 8?	No	No	No	No	No	–
Area 22						
Has access to Area 22 been maintained (have security procedures for base entry served to maintain a restricted access)?	Yes	Yes	Yes	Yes	Yes	–
Have activities that involve digging and construction within Area 22 been controlled by the base excavation/dig permit procedure and other pertinent base instructions?	Yes	Yes	Yes	Yes	Yes	–
If activities requiring an excavation/dig permit were conducted within Area 22, were there any instances in which the permit requirements were not effective in maintaining the requirements of the Institutional Controls Plan?	No	No	No	No	No	–
Have water wells been installed in Area 22, except those for monitoring or remedial actions?	No	No	No	No	No	–
Is pavement still in place at Area 22?	Yes	Yes	Yes	Yes	Yes	Alligatoring, cracks, and potholes throughout observed in 2022, 2023, and 2024.
Has land use at Area 22 changed?	No	No	No	No	Yes	–
Area 7						
Has access to Area 7 been maintained (have security procedures for base entry served to maintain a restricted access)?	Yes	Yes	Yes	Yes	Yes	–
Have activities that involve digging and construction within Area 7 been controlled by the base excavation/dig permit procedure and other pertinent base instructions?	Yes	Yes	Yes	Yes	Yes	–
If activities requiring an excavation/dig permit were conducted within Area 7, were there any instances in which the permit requirements were not effective in maintaining the requirements of the Institutional Controls Plan?	No	No	No	No	No	–
Have water wells been installed in Area 7, except those for monitoring or remedial actions?	No	No	No	No	No	–
Is pavement still in place at Area 7?	Yes	Yes	Yes	Yes	Yes	Root damage noted in 2021. Root damage/cracking throughout noted in 2022. Minor root damage, alligatoring and cracking in paved areas noted in 2023 and 2024.
Has land use at Area 7 changed?	No	No	No	No	No	–
Site 23						
Has access to Site 23 been maintained (have security procedures for base entry served to maintain a restricted access)?	Yes	Yes	Yes	Yes	Yes	–
Have activities that involve digging and construction within Site 23 been controlled by the base excavation/dig permit procedure and other pertinent base instructions?	Yes	Yes	Yes	Yes	Yes	–
If activities requiring an excavation/dig permit were conducted within Site 23, were there any instances in which the permit requirements were not effective in maintaining the requirements of the Institutional Controls Plan?	No	No	No	No	No	–
Have water wells been installed at Site 23, except those for monitoring or remedial actions?	No	No	No	No	No	–
Is pavement still in place at Site 23?	Yes	Yes	Yes	Yes	Yes	Some pavement cracking observed in 2023 and 2024.
Has land use at Site 23 changed?	No	No	No	No	Yes	–

a LUC areas within OU 1 are depicted on Figure 2-1.
N/A Not applicable.

5.0 Technical Assessment

In accordance with the *Comprehensive Five-Year Review Guidance* (EPA, 2001), the technical assessment for NBK Keyport answers three questions:

- Question A: Is the remedy functioning as intended by the decision documents?
- Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?
- Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

Table 5-1 summarizes the responses to Questions A, B, and C based on the technical assessment discussion provided in the following subsections for OU 1 and OU 2 at NBK Keyport.

5.1 Answers to Questions A, B, and C for OU 1

The following section provides a summary response to Questions A, B, and C for OU 1. Additional detail and backup regarding the responses to Questions B and C are then provided in Sections 5.4 and 5.5, respectively. This format is used because the topics of these questions (e.g., changes in applicable or relevant and appropriate requirements [ARARs] and toxicity values) typically apply broadly across OUs and sites and required a detailed discussion to fully convey.

Question A: For OU 1, the remedy is not functioning as intended by the OU 1 ROD (Navy, EPA, and Ecology, 1998); therefore, the answer to Question A is “no.”

Completion of Volume 1 of the supplemental RI during this FYR period changed the Keyport Project Team’s understanding of the CSM in important ways. cVOCs have been found at up to 100 ft bgs beneath the landfill footprint, well below the reach of phytoremediation, which was implemented as one (1) selected remedy component at cVOC “hotspots” identified in the OU 1 ROD. The selected remedy was based on an understanding that cVOCs were primarily present in the upper 15 feet of the subsurface, with limited impacts to depths of about 40 feet bgs. Additional “hotspots” not targeted for phytoremediation have also been identified since remedy implementation. Biodegradation, which was considered an important factor in site cleanup at the time of the OU 1 ROD, has been concluded to largely stall at the DCE stage of reductive dichlorination as described in Section 4.2.1.1, which is not sufficient to result in site cleanup. cVOC concentrations discharging to surface water are more widespread and at substantially higher concentrations than known at the time of the OU 1 ROD, and on-

going PCB releases from Seep SP1-1 appear to be re-contaminating an area of the wetland that was previously remediated (Navy, 2023a).

Although past analysis of tree cores demonstrated that the phytoremediation plantations were taking up and metabolizing cVOCs from shallow groundwater, the trees in both plantations have reached the end of their life cycle. The deeper contamination identified by the supplemental RI is not amenable to remediation using phytoremediation because of root depth and groundwater uptake limitations and therefore this remedy component is no longer functioning as intended by the OU 1 ROD. The lack of a closed canopy indicates that the plantations also provide only an incomplete and seasonally-limited evapotranspiration cap on portions of the landfill. The deaths of individual trees result in a hazard of falling branches and entire trees, presenting a physical risk to workers performing LTM sampling of groundwater monitoring wells and any additional investigation or remediation activities. Work to maintain and observe the plantations no longer contributes to site remediation. This FYR recommends evaluating whether the OU 1 ROD allows discontinuation of phytoremediation and removal of the plantations to eliminate the hazards.

Investigations are on-going and include assessing off-site migration of COCs, verifying exposure assumptions, conducting supplemental human health and ecological risk assessments, and re-evaluating points of compliance, ARARs, RAOs, and cleanup levels to support a ROD Amendment and achieve protectiveness in the future.

Annual LUC inspections and the FYR site inspection demonstrate that LUCs have been adequately implemented and maintained during this FYR period, preventing all currently known human health exposures. The LTM program at OU 1 was put on hold while additional investigations were conducted.

Question B: For OU 1, the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy are currently being re-evaluated based on data obtained during this FYR period, therefore, the answer to Question B is “no” for the following reasons:

1. Exposure point cVOC concentrations for ecological receptors in surface water in the wetland south of the South Plantation are orders of magnitude higher than measured at the time of the OU 1 ROD, so this exposure assumption is no longer valid
2. Ecological cVOC exposures in sediment porewater occur over a much larger portion of the marsh than understood at the time of the OU 1 ROD, so again this exposure assumption is no longer valid

3. PCB sediment data indicate the potential for adverse risk/effects to human health and the benthic community, and PCBs did not pose an unacceptable risk at the time of the OU 1 ROD (see Section 4.2.1.1 for additional discussion regarding PCBs).

ARARs used to establish cleanup levels in the OU 1 ROD (Navy, EPA, and Ecology, 1998) are evaluated in Section 5.5.1 and summarized in Table 5-2. Changes to the HHRA assumptions, including changes in toxicity factors, risk assessment methods, and exposure pathways, are detailed in Section 5.4.2. At the time of this FYR, the data supporting a HHRA/ERA addendum report, (Volume 2 of the supplemental RI), was published as final in an HHRA/ERA field investigation report, but the HHRA/ERA addendum report (Volume 2 of the supplemental RI) presenting risk calculations and drawing final conclusions had not yet been finalized. Based on the data collected and published as final in the final HHRA/ERA field investigation report, exposure point concentration assumptions have changed. The final HHRA/ERA addendum report (Volume 2 of the supplemental RI) may also conclude that other risk assessment exposure assumptions have changed. Based on the data collected in support of the HHRA/ERA addendum, this FYR concludes that the HHRA/ERA addendum report (Volume 2 of the supplemental RI) is likely to find that unacceptable risks to human health are present, with risk drivers expected to be PCBs in sediment and shellfish tissue, and cVOCs in surface water (see also Section 5.4.1.2).

LUCs are implemented and maintained to prevent human health exposures identified in the OU 1 ROD. Land use at OU 1 has not changed since the time of the OU 1 ROD. The current LUCs for Areas A, B, and C within OU 1 were initiated in 2000 and are detailed in Section 2.1.3.2. These include restrictions that prevent construction of water wells in Areas A and B downgradient of the landfill, as well as controls on construction or activities that might affect monitoring and maintenance activities at Area C. At Area D the land use restrictions address maintenance of the landfill cover and activities that might cause exposure from landfill contaminants. Area E has land use restrictions pertinent to controlling activities that might affect wetlands adjacent to the landfill. Results of the annual inspection of these is provided in Section 4.3.

The final HHRA/ERA addendum will be used to assess whether risk conclusions in the OU 1 ROD should be revised. In the interim, the tide flats are currently closed by the Washington State Department of Health (WDOH) and therefore not recommended for shellfish harvesting of other species (WDOH, 2025). In the fifth FYR (Navy, 2020a), this site was identified as “closed” by WDOH and therefore the fifth FYR concluded the remedy was protective in the short term. The HHRA/ERA addendum work plan for sampling in OU 1 identified a discrepancy in WDOH language about closure status in 2022 (Navy, 2022d). This FYR recommends that the site is evaluated to determine if

appropriate signage is in place at accessible locations, and that harvest management decisions should be coordinated with WDOH and the Suquamish Tribe based on the findings of the HHRA/ERA addendum. Note that the Suquamish Tribe has treaty-reserved rights to harvest and maintain the authority to determine harvest practices for tribal members.

Regarding ecological exposure to cVOCs, the area of these exposures is substantially larger than known at the time of the OU 1 ROD, and the concentrations are orders of magnitude higher than understood at the time of the OU 1 ROD.

Based on the data collected in support of the HHRA/ERA addendum, this FYR concludes that the HHRA/ERA is likely to find that unacceptable risks to ecological receptors are present, with risk drivers expected to be dioxans/furans and PCBs in terrestrial soil, and PCBs and cadmium in aquatic media (see also Section 5.4.2).

Question C: For OU 1, no other information has come to light (i.e., other than information discussed in previous sections of this FYR report regarding preliminary data) that could call into question the protectiveness of the remedy; therefore, the answer to Question C is “no.”

Sea level rise and weather pattern changes may significantly impact the magnitude and duration of both tidal forces and storms, thereby increasing erosive forces along shorelines. At OU 1, the sill/causeway that separates Dogfish Bay from the tidal flats and the presence of the tide gate significantly lessen any effects of sea level rise and extreme weather impacts that would cause tidal flooding of the marsh and erosion of the landfill in the short term. Therefore, sea level rise and extreme weather impacts issues do not affect protectiveness at this time. The future FFS should include a resiliency assessment for alternatives considered as potential revised remedy(ies) for OU 1.

5.2 Answers to Questions A, B, and C for OU 2 Area 2

The following section provides a summary response to Questions A, B, and C for OU 2 Area 2.

Question A: For OU 2 Area 2, the remedy is not functioning as intended by the OU 2 ROD (Navy, EPA, and Ecology, 1994); therefore, the answer to Question A is “no.”

The expectation in the OU 2 ROD was that, “Groundwater quality is expected to gradually improve by the action of natural processes such as aquifer flushing, volatilization, and biodegradation.” However, the most recent groundwater concentration data collected from new wells installed at the site in 2022, nearly 30 years after ROD signature, show at least one (1) well exhibiting TCE concentrations more than twice the maximum concentration known at the time of the OU 2 ROD. Although

the LUC components of the remedy continue to prevent exposure via the known pathways, the natural attenuation component of the remedy has not operated within a reasonable restoration timeframe (typically considered to be 30 to 50 years) to reduce COC concentrations to below the RGs.

The fifth FYR recommended additional investigation at OU 2 Area 2 focused on remedy optimization to reduce restoration timeframe and document protection of downgradient receptors. As discussed in Section 4.2.2, a soil and groundwater supplemental investigation was conducted in 2022. In soil samples, TCE was detected in four (4) of 40 samples, VC was detected in five (5) of 37 samples, and cis-1,2-DCE was detected in four (4) of 39 samples. There were no RGs for soil established in the OU 2 ROD. In groundwater samples, TCE was detected above the OU 2 ROD RG of 5 µg/L in one (1) sample and VC was detected above the RG of 0.029 µg/L in five (5) samples. Additionally, the LODs for several non-detect sample results are above PALs established in the 2021 groundwater sampling SAP (Navy, 2021d). The soil and groundwater analytical results indicated that TCE and VC concentrations exist outside of the previously installed point of compliance groundwater monitoring wells (2MW-1, 2MW-6, and MW2-8) and it was recommended that the newly installed monitoring wells (2MW-9 through 2MW-19) be added to the LTM network. However, evaluation of these wells during the FYR indicate that the well screens for wells 2MW-9 and 2MW-10 are too deep to adequately monitor the potential shallow migration of COCs, and additional well installation is recommended. Annual LUC inspections and the FYR site inspection demonstrate that LUCs have been adequately implemented and maintained during this FYR period, preventing all currently known human health exposures.

Question B: For OU 2 Area 2, as discussed in more detail in Section 5.4.1 below, the cleanup level for VC used at the time of the remedy is no longer valid; therefore, the answer to Question B is “no.”

ARARs used to establish cleanup levels in the OU 2 ROD (Navy, EPA, and Ecology, 1994) are evaluated in Section 5.5.1 and summarized in Table 5-3. Changes to the toxicity risk assessment assumptions, including changes in toxicity factors, risk assessment methods, and exposure pathways, are detailed in Section 5.4.2. Although the ARAR value supporting the OU 2 ROD RG for VC is no longer valid, LUCs are implemented and maintained to prevent all currently known human health exposures. The LUCs are detailed in Section 2.2.3, with the specific aim of preventing residential land use and construction of domestic wells. Results of the annual inspection of these are provided in Section 4.3. Land use at Area 2 has not changed since the time of the OU 2 ROD.

Question C: For OU 2 Area 2, no other information has come to light (i.e., other than information discussed in previous sections of this FYR report regarding preliminary

data) that could call into question the protectiveness of the remedy (i.e., LTM and LUCs); therefore, the answer to Question C is “no.”

5.3 Answers to Questions A, B, and C for OU 2 Area 8

The following section provides a summary response to Questions A, B, and C for OU 2 Area 8.

Question A: For OU 2 Area 8, the remedy is not functioning as intended by the OU 2 ROD (Navy, EPA, and Ecology, 1994); therefore, the answer to Question A is “no.”

As part of the recommendations in previous FYRs and as required by the OU 2 ROD, human health and ecological risk assessments have been completed at Area 8. A conclusion of the HHRA that was completed for the Area 8 beach intertidal zone was that incremental site risk over reference area risk for Suquamish subsistence and recreational receptors meets target health goals, despite COC concentrations in sediment and clam tissue exceeding background and reference area concentrations, respectively. A conclusion of the ERA was that unacceptable risk to higher trophic level species was not present (Navy, 2018a), but acute and chronic exposure to accumulated contaminants in sediment pose a current potential hazard to benthic organisms based on the bioassay results/endpoints (Navy, 2020h). Higher trophic level species were represented by the Northwestern crow and the river otter, with the calculated hazard quotient for both species less than 1 (Navy, 2018a). However, an unacceptable risk to benthic organism from exposure to COCs in sediment was found based on the results of the bioassay for larval mussels (Navy, 202h). Therefore, the risk assessments found that contingent groundwater control actions are not needed to protect human health or higher trophic level biota, but contingent groundwater control actions (to be conducted as part of the selected contingent remedy) are needed to protect the benthic community and to achieve overall remedy functionality as intended by the OU 2 ROD.

Results of the vapor intrusion soil gas study performed at OU 2 Area 8 in 2016 indicated the presence of contaminants in an area not previously identified. The highest soil gas concentrations were detected west of the Area 8 plume, adjacent to Building 82. Results of the vapor intrusion study performed as a follow-on to the soil gas study (Navy, 2019a), and the periodic sampling conducted in advance of this FYR (Navy, 2024g) indicate that the presence of this contamination and cVOCs identified in sub-slab vapor do not present a risk to human health via the vapor intrusion pathway. In addition, there is no direct contact pathway to subsurface cVOCs because the entire area is paved, and LUCs are maintained restricting both digging and groundwater use for drinking water. Therefore, the presence of this larger area of contamination does not affect protectiveness. However, these results are being investigated as part of the supplemental RI, which was in progress at the time of this FYR.

The results of the annual LUC inspections at OU 2 Area 8 demonstrate that LUCs have been adequately implemented and maintained, thus preventing human exposure to soil and groundwater as drinking water. The LTM program at OU 2 Area 8 was put on hold while additional investigations were conducted.

Question B: For OU 2 Area 8, the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy are still valid for the terrestrial environment. The human health and ecological risk assessments for the marine environment (required by the OU 2 ROD and recommended in previous FYRs) were completed during the prior FYR period, constituting a revision to the risk assessment assumptions in the OU 2 ROD; therefore, the answer to Question B is “no.”

ARARs used to establish cleanup levels in the OU 2 ROD are evaluated in Section 5.5.1 and summarized in Table 5-3. Changes to the HHRA assumptions, including changes in toxicity factors, risk assessment methods, and exposure pathways, are detailed in Section 5.4.2. The LUCs implemented in 2000 were intended to prevent exposure to soil and groundwater and include restrictions on the installation of drinking water wells and digging (see Section 2.2.3). Land use at Area 8 has not changed since the time of the OU 2 ROD. Results of the annual inspection of the LUCs are provided in Section 4.3.

As stated previously, the HHRA conducted in the Area 8 beach intertidal zone during the fifth FYR period concluded that despite the presence of several COCs in beach sediment and clam tissue samples at concentrations exceeding background and reference area concentrations, the incremental site risk over reference area risk for Suquamish subsistence and recreational receptors met target health goals (Navy, 2020a). Therefore, the Keyport Project Team agreed that no additional investigation or contingent actions, such as groundwater controls, were necessary to protect human health.

The ERA discussed in the fifth FYR identified no risk to higher trophic level biota (Navy, 2018a) but concluded that acute and chronic exposure to accumulated contaminants in sediment pose a current potential hazard to benthic organisms based on the bioassay results/endpoints (Navy, 2018a, 2020h). The area of exposure with unacceptable risk is well delineated and of limited extent within the Area 8 beach intertidal zone. However, based on the OU 2 ROD, contingent groundwater control actions to be conducted as part of the selected remedy are required to protect the benthic community. Additional details about prior changes to the ERA for OU 2 Area 8 is provided in Section 5.4.3.

Question C: For OU 2 Area 8, no other information has come to light (i.e., other than information discussed in previous sections of this FYR report related to preliminary

data) that could call into question the protectiveness of the remedy; therefore, the answer to Question C is “no.”

As was concluded in the fifth FYR, sea level rise and extreme weather impacts effects may significantly impact the magnitude and duration of saltwater intrusion at OU 2 Area 8, thus causing changes to groundwater geochemistry and the attenuation capacity of the aquifer. Based on the HHRA, groundwater COCs have not impacted sediments and surface water quality offshore to cause unacceptable human health risks, indicating that groundwater geochemistry and attenuation capacity have not yet been adversely impacted by saltwater intrusion. Therefore, sea level rise and extreme weather impacts do not currently affect protectiveness. The ongoing supplemental RI will provide further CSM data that can be used for future sea level rise and extreme weather impact assessments. The future FFS should include a resiliency assessment for alternatives considered as a potential revised remedy for OU 2 Area 8.

5.4 Continued Validity of ROD Assumptions (Question B)

This section reviews the validity of ROD cleanup levels by assessing:

- Any changes to standards identified as ARARs
- Any changes in underlying assumptions used to calculate risk-based concentrations identified as cleanup levels in the RODs
- Newly promulgated standards for COCs since the RODs were signed

5.4.1 Changes in Standards and To Be Considered Criteria

For this FYR, all sources of ARARs identified in the RODs (Navy, EPA, and Ecology, 1998 and 1994) were reviewed for changes that could affect the assessment of remedy protectiveness. Based on this review, it was concluded that the following regulations listed as ARARs have changed:

- EPA's National Recommended Water Quality Criteria (304[a]) – aquatic life and human health criteria.
- EPA’s 2022 “Revision of Certain Federal Water Quality Criteria Applicable to Washington” (40 Code of Federal Regulations [CFR] 131.45; formerly the Washington criteria were in 40 CFR 131.36, referred to as the National Toxics Rule [NTR]).
- Water Quality Standards for Surface Waters of the State of Washington (as provided in 173-201A WAC, Table 240 Toxics Substances Criteria, last updated 9/14/2024) – aquatic life and human health criteria.

- Washington State Sediment Management Standards (SMS; Chapter 173-204 WAC), which includes ecological benchmarks such as SCOs, cleanup screening levels (CSLs), or levels between if identified in the prior ROD or subsequent site documentation.
- Washington State MTCA Cleanup Regulations (Chapter 173-340 WAC), in particular, the use of background levels or the laboratory PQL as a cleanup level when the MTCA cleanup level is lower than these values. As such, this FYR includes an assessment of current PQLs used for LTM and a comparison of the current ARARs with the RGs based on background levels or the PQLs.
- Washington State MTCA regulations were updated in 2023 (Ecology, 2023), and the risk-based criteria in the associated Cleanup Levels and Risk Calculation (CLARC) tables were updated in July 2024 to align with EPA's RSL toxicity. The CLARC tables were consulted for this FYR to compare ROD RGs to current MTCA Method B values, where applicable.

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OU 1 RGs were established for groundwater, surface water, sediment, and clam tissue. The basis for the RGs was the protection of human health, if groundwater was used for drinking, if surface water contained a food source, or if clams were harvested by a subsistence population (Navy, EPA, and Ecology, 1998). No specific numeric RG was established for sediment. Instead, the OU 1 ROD indicated that bioassays would be conducted if sediment concentrations exceeded Sediment Quality Standards (SQS). No numeric RG was established for the landfill soil. Instead, the OU 1 ROD indicated that LUCs would be maintained to prevent contact with landfill soil and vapor. The following subsections present the RGs for groundwater, surface water, sediment, and clam tissue established in the OU 1 ROD compared to current ARARs (as of July 2024) and those ARARs with lower values that may impact the protectiveness of the remedy.

Groundwater. Table 5-2 compares modified standards (as of July 2024) with the RGs presented in the OU 1 ROD (Navy, EPA, and Ecology, 1998; Table 11-4). The RGs were based on the use of groundwater as drinking water. There have been no changes to the groundwater ARARs during this FYR period. As described in the fourth FYR (Navy, 2015a), although lower drinking water ARARs were noted for 1,1- dichloroethane (1,1-DCA), 1,2-DCA, cis-1,2-DCE, TCE, and VC, the RGs remain protective because the calculated risks associated with the RGs are either within EPA's acceptable excess cancer risk range of 10^{-4} to 10^{-6} (or MTCA's acceptable excess cancer risk range of 10^{-5} to 10^{-6}), or if the calculated risk is above that risk range, LUCs are in place, and the remedy remains protective for the groundwater COCs. As noted in the fourth FYR (Navy, 2015a), 1,1-DCE is no longer considered a carcinogen. The current maximum

contaminant level (MCL) is approximately an order of magnitude greater than the RG and the MTCA Method B value is approximately three orders of magnitude greater than the RG (i.e., 0.5 μg/L).

The RG for VC was based on the PQL of 0.5 µg/L, which was achievable in 1998. As noted in the fourth FYR (Navy, 2015a), most laboratories can now achieve PQLs of 0.02 µg/L for VC and a recommendation was made in the fourth FYR to adopt the lower PQLs. Investigations performed during this FYR period used this lower PQL as recommended.

The second FYR (Navy, 2005) recommended the addition of 1,4-dioxane to the groundwater analyte list because of its potential to be present in chlorinated solvent plumes. There is no RG established in the OU 1 ROD for 1,4-dioxane. The 2012 CRA Plan (Navy, 2012i) reported the MTCA Method B value of 0.44 µg/L as a screening level and provided a trigger action matrix for detections of 1,4-dioxane. The current MTCA Method B value, as shown in Table 5-2, remains unchanged.

Surface Water. Table 5-2 also compares modified standards for surface water (as of July 2024) with those in the OU 1 ROD (Navy, EPA, and Ecology, 1998; Table 115). Based on the current MTCA Method B values, the RG for TCE would decrease from 56 to 4.9 µg/L. MTCA Method B values for the other COCs have either remained the same or increased.

Since the fifth FYR (Navy, 2020a), Washington State published water quality criteria protective of human health in WAC 173-201A following multiple rule changes from EPA. The EPA published a rule in 2020 to withdraw certain human health criteria in WAC 173-201A but later reversed this through rulemaking from 2021 to 2022. In 2022, the EPA announced a rule that returned the human health criteria to what had previously been approved in 2016 and this rule took effect in 2022. The Washington State criteria for the COCs are listed in Table 5-2 along with water quality criteria currently listed within the Washington State's 2024 updated CLARC table, specifically the 40 CFR 131.45 criteria.

The RGs for trans-1,2-DCE, PCE, TCE, and VC are based on MTCA Method B values for consumption of organisms from surface water. The other surface water ARARs shown in Table 5-2 also are based on consumption of organisms from water. Values differ across regulatory programs based on the values of the exposure input parameters, in particular, the consumption rate. Differences in consumption rates are discussed in Section 5.4.2.2.

As shown in Table 5-2, trans-1,2-DCE, PCE, TCE, and VC would have lower or more stringent surface water ARARs if selected today. While cis-1,2-dichloroethene was detected in surface water samples collected in 2021 (Navy, 2024a) there has been no

update in an ARAR for this chemical since the OU 1 ROD. Based on the most recent surface water sampling results from South Marsh Creek within OU1 (Navy, 2024a):

- The maximum concentration of trans-1,2-DCE detected (at 5.2 μg/L) is significantly less than the RG of 33,000 μg/L and federal water quality criteria of 1,000 μg/L; therefore, the lower ARAR does not impact the protectiveness of the remedy with regard to trans-1,2-DCE.
- PCE concentrations were not detected above the LOD; thus, the lower ARAR does not impact the protectiveness of the remedy with regard to PCE.
- Concentrations of TCE detected in one (1) of the 13 surface water samples exceeded the RG of 56 μg/L, and concentrations of TCE in 10 of 13 surface water samples were greater than the federal water quality criterion of 0.70 μg/L.
- Concentrations of VC detected in 10 of the 13 surface water samples exceeded the RG of 2.9 μg/L. Three (3) of 13 samples were below detection limits and the remaining 10 surface water samples showed concentrations of VC greater than the federal water quality criterion of 0.18 μg/L.

For PCBs, the surface water RG is based on the PQL (i.e., 0.04 μg/L), not a MTCA or water quality criterion, which are both orders of magnitude lower. The maximum detected value remains above the RG (see Appendices C and D). Therefore, using a method to achieve a lower PQL is premature at this time. However, once concentrations reduce below the RG, a revised method should be evaluated for future sampling to meet a human health risk-based value.

Review of the surface water, sediment, and marine tissue data collected in support of the HHRA/ERA addendum (Navy, 2024a) indicates that the HHRA is likely to conclude that potential unacceptable risks are present, driven by cVOCs and PCBs in surface water, as well as in sediment and shellfish. The human health exposure pathway is currently incomplete because the tide flats are currently closed by WDOH to harvesting and consuming shellfish by recreational and subsistence harvesters. Note that the Suquamish Tribe has treaty-reserved rights to harvest and maintains the authority to determine harvest practices for tribal members.

For ecological receptors, review of the surface water and sediment data collected in support of the HHRA/ERA addendum (Navy, 2024a) indicates that the ERA is likely to conclude that potential unacceptable risks are present for benthic organism exposures to cVOCs and metals in some exposure areas.

Final conclusions regarding current risks to human health and the environment will be presented in the final HHRA/ERA addendum following Keyport Project Team review.

Sediment. The OU 1 ROD established RGs for the nine (9) VOCs identified as COCs and for PCBs (Navy, EPA, and Ecology, 1998; Table 11-6). The RGs were based on the Washington State 1995 SMS, which include SQS criteria for the protection of the benthic community and performance of bioassays if the chemical result failed the SQS criterion. For these nine VOCs, the SQS and CSLs were both bioassays per the OU 1 ROD, with both bioassays and numeric CSLs for PCBs (Navy, EPA, and Ecology, 1998; Table 11-6). The OU 1 ROD also identified pesticides, SVOCs, and metals as sediment COIs to be included in the LTM program to monitor ecological risks posed by potential migration of landfill contaminants. Although RGs were not established in the OU 1 ROD for COIs, COI data have been historically compared to current SMS criteria.

As addressed in the fourth FYR (Navy, 2015a), the SMS was revised in September 2013, including an updated cleanup decision framework to address bioaccumulative chemicals (e.g., PCBs) that pose risks to human health and higher trophic level species. The risks to humans and higher trophic levels occur primarily through consumption of fish/shellfish. Under the revised SMS, the SQS criterion protective of the benthic community for PCBs remains 12 mg/kg.

The work plan (Navy 2024a) for the in-progress HHRA/ERA addendum incorporates the SMS regulation and SCUM guidance, and the HHRA/ERA is being performed with the review and oversight of Ecology. As discussed above under **Surface Water**, the HHRA/ERA addendum is likely to conclude that potential unacceptable risks are present, driven by cVOCs and PCBs in surface water, sediment, and shellfish. Following completion of the HHRA/ERA, the Navy will work with the Keyport Project Team to establish updated sediment cleanup criteria that comply with ARARs and are memorialized in a future ROD Amendment.

Clam Tissue. Clam tissue RGs were established for the nine (9) VOCs identified as COCs and for PCBs. Because VOCs were never detected in clam tissue, VOCs were removed from the analyte list and their RGs are no longer included for review. The RG for PCBs of 0.015 mg/kg was a site-specific risk-based level protective of subsistence consumption of clams. PCBs were not detected in clam tissue above the RG of 0.015 mg/kg in the 2004 and 2009 monitoring events; therefore, tissue analysis was discontinued after 2009 based on regulator-approved recommendations in the third FYR (Navy, 2010).

During the fifth FYR period, clam samples were collected from a single monitoring station (i.e., TF21) within the tide flats as reported in the 2017 LTM Report (Navy, 2018d). No PCB Aroclors were detected in TF21 marine (clam) tissue above the respective PQL for each Aroclor. The PQLs ranged from 10 micrograms per kilogram (µg/kg) to 15 µg/kg, all below or equal to the RG of 0.015 mg/kg (i.e., for the shellfish ingestion pathway).

The PCB RG for clam tissue was established as a risk-based level protective of subsistence harvesters using a consumption rate of 92 grams per day (g/day). This consumption rate is much lower than what is expected today for the Suquamish Tribe consumption rate. In consultation with the Suquamish Tribe and stakeholders, it was decided that a shellfish consumption rate of 498.4 g/day better represents tribal members consumption of shellfish. If this higher consumption rate better reflects the Suquamish population potentially at risk, a revised site-specific RG if calculated today using the original exposure assumptions included in Appendix B, Table B-1 of the OU 1 ROD (along with the higher Suquamish-specific consumption rate) would be much lower at 0.0028 mg/kg. This revised RG cannot be compared to the historical clam data, as the PQLs are higher.

Source investigation data are being used in the ongoing HHRA addendum to evaluate the risk to subsistence fishers from consumption of shellfish. The ongoing HHRA addendum is utilizing risk-based screening concentrations for clam tissues that rely on the higher consumption rate of Suquamish Tribe members, and the COPCs in shellfish tissue for the ongoing HHRA addendum include PAHs, PCB congeners, arsenic, cadmium, methyl mercury, nickel, zinc, and lead.

As discussed above under **Surface Water**, the HHRA/ERA addendum is likely to conclude that potential unacceptable risks are present, driven by cVOCs and PCBs in surface water, sediment, and shellfish.

Additional information regarding exposure assumptions (shellfish consumption rate) is reviewed in Section 5.4.2.2.

OU 2 Area 2

ARARs used to establish cleanup levels in the OU 2 ROD (Navy, EPA, and Ecology, 1994; Table 7-8) and comparison to current ARARs are provided in Table 5-3. OU 2 Area 2 COCs are TCE and VC in groundwater only, and RGs are based on human consumption of groundwater for potable water purposes. There have been no changes to the groundwater ARARs during this FYR period. As shown in Table 5-3, the RG for TCE was established as the MCL (i.e., 5 µg/L), and there has been no change to the MCL for TCE although the MTCA Method B value is lower at 4 µg/L. For VC, the RG was established as the MTCA Method B cleanup level of 0.023 µg/L, which at the time, was below the PQL of standard EPA methods for drinking water. In such a case, the MTCA B cleanup level was based on the PQL (per WAC 173-340-700[6]) and the expected PQL was 0.1 µg/L. In 2012, the RG for VC was updated to 0.029 µg/L based on the calculated MTCA B cleanup level using the current oral slope factor. Using improved analytical techniques (e.g., EPA Method 8260C-SIM), the PQL has been below this updated RG of 0.029 µg/L since June 2012. From 1995 through this FYR

reporting period, VC concentrations in monitoring well 2MW-6 have been above the RG of 0.029 μg/L for the majority of the sampling events. VC concentrations in groundwater samples from most of the new monitoring wells installed in 2022 also exceeded this RG (see Section 4.2.2). Although the RG continues to be exceeded for VC in groundwater, LUCs are implemented and maintained, restricting groundwater use for potable water purposes. Therefore, the remedy remains protective in the short term.

OU 2 Area 8

The OU 2 ROD (Navy, EPA, and Ecology, 1994) identified three COCs in OU 2 Area 8 soil based on residential land use: arsenic, cadmium (if ingested in homegrown produce), and chromium. However, arsenic concentrations were considered at or below background for soil and groundwater. In OU 2 Area 8 groundwater, the 1993 baseline risk assessment identified cadmium, chromium, and TCE as COCs with hazard quotients (HQs) greater than 1 and five (5) additional COCs (i.e., carbon tetrachloride, chloroform, 1,2-DCA, 1,1-DCE, and 1,1,2-TCA) with cancer risks exceeding 1×10^{-5}, if shallow groundwater was used for drinking water (Navy, EPA, and Ecology, 1994; Table 10-4).

As explained in the third FYR, the LTM program at Area 8 has been tracking cadmium, chromium, TCE, PCE,1,1-DCE, cis-1,2-DCE, and 1,1,1-TCA in groundwater based on detections above ARARs. Other chemicals noted in the OU 2 ROD as having been identified in the risk assessment as COCs or potential COCs have either not been detected, or detections have been very low. Therefore, the seven (7) chemicals included in the LTM program have been established as the COCs for the site. The current analyte list for LTM includes selected metals and VOCs related to TCE and its breakdown products. A comparison of the OU 2 ROD RGs with current ARARs and changes to values that may impact the protectiveness of the remedy are described by media in the sections below.

Soil. The RGs and ARARs stated in the OU 2 ROD for Area 8 included 17 VOCs and 15 inorganic chemicals (i.e., metals and metalloids; Navy, EPA, and Ecology, 1994; Table 10-10). Of these chemicals, only arsenic, cadmium, and total chromium had maximum concentrations that exceeded soil RGs for VOCs or soil removal levels for inorganic chemicals in soil at that time. As explained in the third FYR, the remaining organic and inorganic chemicals are listed in the OU 2 ROD but are not the focus of monitoring. Cadmium and chromium (total chromium concentrations were assumed to be 100 percent Cr(VI) per the OU 2 Area 8 ESD) RGs of 80 and 400 mg/kg, respectively, were based on MTCA Method B (Navy, EPA, and Ecology, 1994). The current MTCA Method B soil values are 80 mg/kg for cadmium (i.e., remains the same) and 240 mg/kg for Cr(VI) (i.e., lower). As demonstrated in the fourth FYR (Navy, 2015a), the lower Cr(VI) value called into question the protectiveness of the remedy.

However, LUCs are in place that restrict residential land use; therefore, the remedy remains protective in the short term with regard to chromium in soil. Action would be required in the future if the land is converted to residential land use, and a process is in place through LUC management to trigger such action.

Groundwater. Table 5-3 compares current groundwater ARARs with those presented in the OU 2 ROD Navy, EPA, and Ecology, 1994; Table 10-12). The modified standards have not changed during this FYR period. As discussed in the fourth and fifth FYRs (Navy, 2015a, 2020a), lower drinking water ARARs were noted for Cr(VI), cis-1,2-DCE, and TCE. Although no cleanup level was established in the OU 2 ROD for 1,4-dioxane, it was added to the LTM program in 2011. At the time of initial sampling in 2007, the MTCA Method B value was 4 µg/L (it is currently 0.44 µg/L). During the fifth FYR period, concentrations of TCE, PCE, and 1,4-dioxane were detected above the RG and MTCA Method B cleanup levels (Navy, 2019b). However, LUCs are in place that prevent groundwater use as drinking water; therefore, the remedy remains protective in the short term for groundwater. No new groundwater data were published as final during this sixth FYR period.

Surface Water. Because OU 2 Area 8 groundwater discharges into Port Orchard Bay, there is a potential for chemical migration from groundwater to the marine environment. Therefore, Table 5-3 also compares modified standards for surface water (as of February 2020) with those selected in the OU 2 ROD (Navy, EPA, and Ecology, 1994; Table 10-12). The RGs for trivalent chromium and 1,1,1-TCA are based on MTCA Method B values for consumption of organisms from surface water. Current MTCA B values are greater than the RGs. The RGs for cadmium and Cr(VI) are based on the national water quality criteria (WQC) for aquatic life and these values have not changed since the OU 2 ROD. For the remaining COCs (i.e., 1,1-DCE, PCE, and TCE), the surface water RGs were based on the national WQC for protection of human health. The national WQC for human health for TCE was the only criterion to decrease since the OU 2 ROD. The other two (2) values have increased since the OU 2 ROD RGs were selected.

Since the fifth FYR (Navy, 2020a), Washington State published WQC protective of human health in WAC 173-201A following multiple rule changes from EPA. The EPA published a rule in 2020 to withdraw certain human health criteria in WAC 173-201A but later reversed this through rulemaking from 2021 to 2022. In 2022, the EPA announced a rule that returned the human health criteria to what had previously been approved in 2016 and this rule took effect in 2022. Table 5-3 compares the RGs that were based on WQC to the current ARAR values.

In summary, if selected today, the surface water RGs would be higher for 1,1-DCE (4,000 µg/L) and 1,1,1-TCA (50,000 µg/L), and would be lower for PCE (2.9 µg/L) and

TCE (0.70 µg/L). An explanation of differences in ARARs and surface water quality criteria due to alternate consumption rates are provided below in Section 5.4.2.2. Concentrations of TCE observed in groundwater monitoring wells and a subset of seep water samples collected during the fifth FYR period were above the current Federal WQC. Concentrations of PCE, 1,1-DCE, and 1,1,1-TCA were all below both the established RGs and current Federal WQC. No new data were published as final during this sixth FYR period.

Sediment. As discussed previously, the SMS was revised in September 2013, with an expanded emphasis on assessing human health risks. No numerical sediment RGs were established in the OU 2 ROD. The results of the LTM sediment and tissue sampling have been used to assess human health and ecological risks from exposure to marine sediment and tissue. Based on LTM sediment concentrations exceeding risk-based screening levels and recommendations in the third and fourth FYRs, an HHRA/ERA was conducted in 2018 utilizing sediment and clam tissue data obtained in 2015 and 2016. The HHRA/ERA (Navy, 2018a) was developed in collaboration with the EPA, Ecology, and Suquamish Tribe project managers and performed in accordance with an approved HHRA/ERA Work Plan (Navy, 2016). The HHRA concluded that despite the presence of several COCs in Area 8 beach sediment and clam tissue samples at concentrations exceeding the Ecology “Bold” dataset natural background concentrations and reference area concentrations, the incremental site risk over reference area risk for Suquamish subsistence and recreational receptors met target health goals (Navy, 2018a). As such, the Keyport Project Team agreed that no additional investigation or contingent actions, such as groundwater controls, were necessary to protect human health.

Likewise, the ERA found no significant hazards to free-swimming aquatic life, semi-aquatic birds, or mammals; therefore, contingent actions, such as groundwater controls, are not necessary to protect these higher trophic receptor groups. Existing lines of evidence suggested that the hazards to benthic organisms were likely low, despite localized elevated concentrations of selected metals (i.e., cadmium, mercury, and silver) in seeps and sediment. Ecology’s SMS regulation and the OU 2 ROD allow the use of bioassay analysis in cases where chemical concentrations in sediment samples exceed the published numeric standards. To assess whether OU 2 Area 8 COCs pose a hazard to benthic organisms on the Area 8 beach, additional seep and sediment bioassay data were collected in 2019. As reported in the ERA Addendum (Navy, 2020h), the additional bioassay data collected at Seep C using mussels as an indicator species demonstrate that seep water COCs do not pose a hazard to benthic organisms. However, acute exposure to accumulated contaminants in sediment pose a potential hazard to benthic organisms based on the bioassay results for larval mussels at two (2) locations. In addition, chronic exposure to accumulated contaminants in sediment pose a potential

hazard to benthic organisms based on the bioassay endpoints of both reduced survival and growth for juvenile polychaetes at two (2) locations.

Therefore, elevated cadmium concentrations occur in sediment, and because acute and chronic exposure to accumulated contaminants in sediment pose a potential hazard to benthic organisms based on the bioassay results/endpoints, additional or contingent actions (to be conducted as part of the selected remedy) are planned and will be performed to achieve protectiveness (Navy, 2020a). During this sixth FYR period, the Navy performed additional investigation in support of contingent remedial action and a supplemental remedial investigation was in progress during preparation of this FYR report.

5.4.2 Review of Human Health Risk Assessment Assumptions

Risk assessment assumptions were also reviewed as part of the requirement to assess protectiveness of the remedies. For human health, there are potentially three (3) areas where changes could have occurred since the signing of the RODs:

- COC toxicity or contaminant characteristics
- Risk assessment methodology, including exposure assumptions
- Changes in exposure pathways

The following subsections discuss how these changes affect the protectiveness of the remedy.

5.4.2.1 Changes in Toxicity and Other Contaminant Characteristics

This section provides the details regarding changes in toxicity and other contaminant characteristics, which generally apply sitewide. As the changes are summarized, the applicability to each OU and site is identified.

There have been changes in oral cancer and non-cancer toxicity criteria since the RODs were signed; however, these changes were captured during the completion of the fourth and fifth FYRs (Navy, 2015a, 2020a) and highlighted as reasons for differences between ROD and current MTCA Method B values. As of 2024, EPA Integrated Risk Information System (IRIS) and Ecology now classify Cr(IV) as a carcinogen, and therefore the updated CLARC table includes lower MTCA Method B values for Cr(IV) in groundwater and surface water based on an oral cancer potency factor (Ecology, 2024a). EPA updated the RfD and CPF applied to human health risk assessment of arsenic, and Ecology's CLARC Tables reflected this update in January 2025 with lower groundwater and surface water levels for arsenic. However, as with beryllium and manganese, the concentrations evaluated in groundwater at the time of

the ROD were determined to be similar to background and were not considered for RAOs (Navy, EPA and Ecology, 1994). Similarly, soil levels were not established due to occurrence at background concentrations, or where arsenic exceeded background, the presence of other contaminants of concern already triggered actions that would address the elevated concentrations of arsenic detected at that specific site. Otherwise, there have been no changes to oral cancer and non-cancer toxicity criteria associated with site COCs during this FYR period.

Cancer and non-cancer inhalation toxicity criteria for vapor intrusion contaminants at OU 2 Area 8 have not changed based on an evaluation of the MTCA Method C air criteria selected as PALs in the Vapor Intrusion SAP (Navy, 2019e) to current MTCA Method C air criteria provided in the July 2024 CLARC tables (Ecology, 2024a). Note however, that the current CLARC tables are rounded to two (2) significant figures compared to earlier versions of the CLARC tables.

5.4.2.2 Changes in Risk Assessment Methods

Surface water screening levels are based on the consumption of aquatic organisms, and these levels can differ across regulatory programs based on the exposure input parameters (e.g., consumption rate and body weight assumptions). Changes in these input parameters affect risk results at both OU 1 and OU 2 Area 8.

OU 1

For OU 1, the RG for PCBs in tissue was calculated during OU 1 ROD preparation as a site-specific, risk-based level protective of subsistence-level ingestion of clams, using a subsistence shellfish consumption rate of 92 g/day.

If the OU 1 RGs for tissue are revised based on the in-progress HHRA addendum (which would require a ROD Amendment or ESD), other exposure parameters used in the development of the OU 1 RGs will be updated to be consistent with the following exposure parameters used in the OU 2 Area 8 HHRA shellfish consumption exposure scenario:

Parameter	OU 1 ROD RG Value	OU 2 Area 8 HHRA Value
Fraction ingested from contaminated source	0.25 (unitless)	1 (unitless)
Exposure duration	70 years	64 years (adult) 6 years (child)
Body weight	70 kilogram (adult)	79 kilogram (adult) 16.8 kilogram (child)

Updates to the exposure parameters would result in a lower RG for PCBs at OU 1; however, there are currently WDOH restrictions in place that prohibit the harvesting of

shellfish and therefore the human health exposure pathway is incomplete. Note that the Suquamish Tribe has treaty reserved rights to harvest and maintain the authority to determine harvest practices for tribal members.

Currently, additional data have been collected to support the ongoing HHRA/ERA addendum (Navy, 2024a). As the HHRA/ERA work plan for OU 2 Area 8 was developed in collaboration with the Keyport Project Team, applicable elements of this work plan were also incorporated into the OU 1 HHRA/ERA work plan to the extent practical, such that evaluations are performed consistently across OUs at NBK Keyport.

Although the HHRA/ERA addendum for OU 1 was not finalized during the data review period for this FYR, the data collected in support of the HHRA/ERA addendum were presented in a finalized document in time for this FYR (see also Section 4.2.1). Preliminary review of these finalized data, with consideration of the latest exposure parameters and ingestion rates discussed above, leads this FYR to conclude that the finalized HHRA/ERA addendum for OU 1 is likely to find unacceptable risks to human health across several of the exposure areas being evaluated. These findings of the HHRA/ERA addendum are expected to be finalized during 2025, and the expected conclusions of the HHRA/ERA addendum form the primary basis for the conclusion of this FYR that the remedy for OU 1 is not protective (see Section 7.0). Based on the data reviewed to date, risk drivers for human health are expected to be PCBs in sediment and shellfish tissue and cVOCs in surface water. The human health exposure pathway is currently incomplete because the tide flats are currently closed by WDOH to harvesting and consuming shellfish by recreational and subsistence harvesters. Note that the Suquamish Tribe has treaty-reserved rights to harvest and maintains the authority to determine harvest practices for tribal members.

OU 2 Area 8

Several changes to either State of Federal WQC, such as PCE and TCE relevant for OU 2 Area 8 (Table 5-3), reflect updates to fish or shellfish consumption rates (U.S. EPA, 2007; Ecology, 2024a).

In the fifth FYR and supporting information (Navy, 2020a; Suquamish Tribe, 2000; Table T-3), a subsistence shellfish consumption rate was determined specifically for the Suquamish Tribe and used in the risk assessment for OU 2 Area 8 (Navy, 2018a, 2020h). In consultation with the Keyport Project Team, the 95th percentile consumption rates for adults and children from this study for shellfish Groups E and G were used in the OU 2 Area 8 HHRA. For adults, EPA modified the 95th percentile shellfish consumption rate from the rate in the Suquamish Tribe's report (615.4 g/day) to include only species harvested from Puget Sound. Therefore, the EPA-modified value, 498.4 g/day (65 percent of total consumed seafood) from the EPA Framework document

(EPA, 2007, Appendix B, Table B-2) was used in the OU 2 Area 8 HHRA as the appropriate adult shellfish consumption rate for a Puget Sound location. For children, the 95th percentile shellfish ingestion rate of 83.9 g/day was calculated using the all-shellfish tribal consumption rate of 4.994 grams per kilogram day (g/kg-day) and the Tribe-specific body weight of 16.8 kg (Suquamish Tribe, 2000; Table C-6) was used.

5.4.2.3 Changes in Exposure Pathways

OU 1

Based on the early findings of the supplemental RI (Navy, 2023a) that indicated substantial changes to the CSM, the Navy initiated an addendum to the HHRA/ERA for OU 1 (Navy, 2021e, 2022d). The objective of the HHRA/ERA addendum was to assess whether site-related contaminants present in OU 1 media are at concentrations that pose potential unacceptable current or future risk to exposed human or ecological receptors beyond what was identified in the baseline risk assessments (Navy, 1993c, 1993d) and supplemental risk evaluation (Navy, 1997b). The first question to be answered by the HHRA/ERA addendum to meet this objective was, “Does the refined CSM identify new receptors/pathways?” (Navy, 2022d). The HHRA/ERA addendum, which includes this receptor/pathway analysis, was in draft form and being reviewed by the Keyport Project Team at the time of this sixth FYR. In general, receptors and pathways were evaluated for 10 exposure areas defined in the HHRA/ERA addendum work plan (Navy, 2022d and Figure 4-18) and updated HHRA/ERA CSMs. Conclusions regarding changes in exposure pathways at OU 1 will be presented in the seventh FYR following finalization of the HHRA/ERA addendum.

OU 2

Ongoing investigations at OU 2 Area 2 and OU 2 Area 8 may identify changes in exposure pathways that will be evaluated in the seventh FYR following completion of that work.

5.4.3 Review of Ecological Risk Assessment Assumptions

The ERA conducted for OU 2 Area 8 (Navy, 2018a, 2020h) did not utilize the exposure factors from the original baseline risk assessments (as stipulated by the OU 2 ROD) because new information and activities completed at the Area 8 beach affected how the current risk assessment evaluated tissue and sediment results and quantified risk. Information and revised methods of evaluating environmental media contained in the 2013 revised SMS regulation and in the SCUM guidance were incorporated into the ERA for OU 2 Area 8, in addition to updates that have occurred to federal and state ERA guidance, guidelines, and policy since the OU 2 ROD. A risk assessment work

plan was developed for OU 2 Area 8 in collaboration with Keyport Project Team and the subsequent HHRA/ERA addendum work plan for OU 1 utilized this work plan to the extent practical, such that risk assessments are performed consistently across OUs. The resulting HHRA/ERA addendum for OU 1 is utilizing updated ERA assumptions as well as a substantially larger dataset than was available at the time of the OU 1 ROD (see also Section 4.2.1). Although the HHRA/ERA addendum was not finalized during the data review period for this FYR, the data collected in support of the HHRA/ERA addendum were presented in a finalized document in time for this FYR (as summarized in Section 4.2.1). Preliminary review of these finalized data, with consideration of the updated ERA assumptions as used at OU 2 Area 8, leads this FYR to conclude that the finalized HHRA/ERA addendum for OU 1 is likely to find unacceptable risks to ecological receptors in both terrestrial soil and aquatic media. The findings of the HHRA/ERA addendum are expected to be finalized in 2025, and the expected conclusions of the HHRA/ERA addendum form the primary basis for the conclusion of this FYR that the remedy for OU 1 is not protective (see Section 7.0).

5.5 Any Other Information That Could Call into Question the Protectiveness of the Remedy (Question C)

Research indicates that any shoreline remedies (e.g., tide gate, cutoff walls, shoreline armoring) may be vulnerable to sea level rise and weather pattern changes, not apparent during remedy selection. Sea level rise and extreme weather impacts increase the possibility of flooding/inundation or significant saltwater intrusion of the shoreline areas and can increase the energy of storm events and thus, their erosive force. The conclusions of the fifth FYR regarding potential sea level rise and extreme weather impacts to the NBK Keyport remedies remain valid and are reiterated in this FYR.

In August of 2024 the Navy released a guidance document that provides a framework for assessing resilience at Navy environmental restoration sites (Navy, 2024m). The release date of this guidance document and the contracting timeline for this FYR did not allow for use of the full framework process in this FYR, but the Navy expects to implement the framework process in the seventh FYR.

OU 1

At OU 1, the sill/causeway that separates Dogfish Bay from the tidal flats and the presence of the tide gate significantly lessen any effects of sea level rise and extreme weather impacts that would cause tidal flooding of the marsh and erosion of the landfill. The northwest to southeast fetch along the long axis of Dogfish Bay that would produce wind-wave energy directed at the landfill shoreline is interrupted first by the Highway 308 causeway and then by the base perimeter road causeway. Wave energy impacts are dissipated by these structures currently and will continue to do so in the future even

if wind-wave energy increases because of extreme weather. The tide gate installed in the perimeter road causeway limits the maximum tide height experienced along the landfill shoreline, regardless of current or future tide heights outside of the tide gate, by mechanically closing at a specified water level. Therefore, sea level rise and extreme weather impacts issues do not currently affect protectiveness of the remedy at OU 1. The future FFS should include a resiliency assessment for alternatives considered as potential revised remedy(ies) for OU 1.

OU 2

No shoreline remedies are implemented at OU 2 Area 2 and sea level rise and extreme weather impacts issues do not currently affect protectiveness of the remedy at OU 2 Area 2. However, based on its low elevation and proximity to the shallow lagoon, potential sea level rise attributable may call into question the protectiveness of the remedy at OU 2 Area 2 in the future and should be monitored during future FYRs.

At OU 2 Area 8, sea level rise and extreme weather effects may significantly impact the magnitude and duration of saltwater intrusion, thus causing changes to groundwater geochemistry and the attenuation capacity of the aquifer. Based on the HHRA, groundwater COCs have not impacted sediments and surface water quality offshore significantly enough to cause unacceptable human health risks, indicating that groundwater geochemistry and attenuation capacity has not yet been adversely impacted by saltwater intrusion. Therefore, sea level rise and extreme weather impacts issues do not currently affect protectiveness of the remedy at OU 2 Area 8. The future FFS should include a resiliency assessment for alternatives considered as a potential revised remedy for OU 2 Area 8.

Table 5-1. Summary of the Technical Assessment for NBK Keyport

OU	Area/Site	Question A: Is the remedy functioning as intended by the decision documents?	Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?	Question C: Has any other information come to light that could call into question the protectiveness of the remedy?
OU 1	Area 1	No	No	No
OU 2	Area 2	No	No	No
	Area 8	No	No	No

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Table 5-2. Groundwater and Surface Water ARARs for OU 1

	Drinking Water (µg/L)						Surface Water Protection (Marine; µg/L)						
			Current Values					Current Values[e]					
Chemical	ROD RG[a]	Basis of ROD RG	MTCA Method B[b]	Federal and State MCL	PQL	Change in RG if Established Today?	ROD RG Based on MTCA Method B Surface Water[a]	MTCA Method B[b]	National WQC CWA §304	State WQC 173-201A WAC[c]	Federal WQC 40 CFR 131.45[d]	PQL	Change in RG if Established Today?
1,1-DCA	800	MTCA B	7.7	None	N/A	Yes, lower (MTCA)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1,2-DCA	5	MCL	0.48	5	N/A	No (MCL); Yes, lower (MTCA)	59	59	650	120	73	N/A	No (MTCA)
1,1-DCE	0.5	PQL	400	7	0.02	Yes, higher (MCL)	1.9	23,000	20,000	4,100	4,000	N/A	Yes, higher
cis-1,2-DCE[f]	70	MCL	16	70	N/A	No (MCL); Yes, lower (MTCA)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
trans-1,2-DCE	100	MCL	160	100	N/A	No (MCL)	33,000	33,000	4,000	5,800	1,000	N/A	Yes, lower (federal WQC)
PCE[g]	5	MCL	5	5	N/A	No (MCL)	4.2	100	29	7.1	2.9	N/A	Yes, lower (federal WQC)
1,1,1-TCA	200	MCL	16,000	200	N/A	No (MCL)	41,700	930,000	200,000	160,000	50,000	N/A	Yes, higher
TCE[h]	5	MCL	4	5	N/A	No (MCL); Yes, lower (MTCA)	56	4.9	7	0.86	0.70	N/A	Yes, lower (federal WQC)
VC	0.5	PQL	0.029	2	0.02	Yes, lower (MTCA/PQL)	2.9	3.7	1.6	0.26	0.18	N/A	Yes, lower (federal WQC)
PCBs	0.04	PQL	0.022	0.5	0.01-0.005	Yes (MTCA/PQL)	PQL: 0.04	0.0001	0.000064	0.00017	0.000007	0.01-0.005	Yes (PQL)
1,4-Dioxane[i]	None	N/A	0.44	None	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

a. Source: ROD Table 11-4 for groundwater and Table 11-5 for surface water (Navy, EPA, and Ecology, 1998).
b. Model Toxics Control Act (MTCA) Method B levels as reported in the Cleanup Levels and Risk Calculation (CLARC) Master Table dated July 2024. CLARC cleanup levels for hazardous waste sites comply with the MTCA Cleanup Regulation, chapter 173-340 WAC as provided in Ecology, 2023.
c. 173-201A WAC, Table 240. Permanent ruling in August 2016 and last updated December 2023. Based on a much higher consumption rate of 175 g/day compared to a MTCA Method B consumption rate of 54 g/day: https://apps.leg.wa.gov/WAC/default.aspx?cite=173-201A-240.
d. Differences in water quality criteria for 40 CFR 131.45 reflect changes through EPA rulemaking promulgated in 2022 that reversed previous changes in the draft rule for 2019 (Ecology, 2024b).
e. Derived for human health for the consumption of organism only.
f. In accordance with WAC 173-340-720(3)(a) and 173-340-720(7)(b), the MCL for cis-1,2-DCE is not sufficiently protective when compared to the current MTCA B drinking water values. Therefore, the MCL would no longer be acceptable if cleanup levels were to be established today, i.e., the non-cancer hazard level of the MCL would exceed hazard index of 1.
g. Because the MCL does not exceed a hazard quotient of 1 or a cancer risk of 1 x 10^{-5}, the MCL can be selected as the Method B ground water cleanup level [WAC 173-340-720 (7) (b)]. Thus, the MTCA groundwater cleanup levels are based on the MCL for PCE of 5 µg/L.
h. Normally, under MTCA, Ecology would use the MCL of 5 µg/L for TCE as the Method B cleanup level. However, in this case, the new toxicity information indicates the MCL exceeds a hazard quotient of 1. Therefore, under WAC 173-340-720 (7)(b), the MCL must be adjusted downward to 4 ug/L, so that the Method B cleanup level will not exceed a hazard quotient of 1. Thus, 4 ug/L is selected as the Method B groundwater cleanup level instead of the standard risk-based MTCA Method B value of 0.54 µg/L (Ecology, 2020).
i. The chemical was identified as a potential chemical of concern in the second FYR; therefore, no ROD RG was established.

Notes:
CFR – Code of Federal Regulations
DCA – dichloroethane
DCE – dichloroethene
MCL – maximum contaminant level
µg/L – microgram per liter
MTCA – Model Toxics Control Act
N/A – not applicable
PCB – polychlorinated biphenyl
PCE – tetrachloroethene
PQL –- practical quantitation limit
RG – remedial goal
ROD – Record of Decision
TCA – trichloroethane
TCE – trichloroethene
WAC – Washington Administrative Code
WQC – water quality criteria

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Table 5-3. Groundwater ARARs for OU 2

Chemical	Drinking Water (µg/L)						Surface Water (Marine; µg/L)						
			Current Values				ROD Surface Water Cleanup Level	Basis of Cleanup Level	Current Values				
	ROD RG[a]	Basis of ROD RG	MTCA B[b]	Federal MCL	State MCL	Change in Cleanup Level if Established Today?			MTCA B[b]	National WQC CWA §304	State WQC 173-201A WAC	Federal WQC 40 CFR 131.45g	Change in Cleanup Level if Established Today?
Area 2													
TCE[b]	5	MCL	4	5	5	No (MCL); Yes, lower (MTCA)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
VC	0.1 (0.023)[c]	PQL	0.029	2	2	Yes, lower (MTCA)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Area 8													
Cadmium	5	Federal MCL	8	5	5	No	8	National WQC (Aquatic Life)	41	7.9 (Aquatic Life)	9.3 (Aquatic Life)	None	Yes, higher
Trivalent chromium	16,000	MTCA B	24,000	None	None	Yes, higher	160,000	MTCA B	240,000	None	None	None	Yes, higher
Hexavalent chromium	80	MTCA B	0.046	None	None	Yes, lower	50	National WQC (Aquatic Life)	0.13	50 (Aquatic Life)	50 (Aquatic Life)	None	Yes, lower
Chromium (total)	50	State MCL	None	100	100	Yes, higher	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1,1-DCE	7	MCL	400	7	7	No	3.2	National WQC (HH)	23,000	20,000 (HH)	4,100 (HH)	4,000 (HH)	Yes, higher
cis-1,2-DCE[e]	70	MCL	16	70	70	No (MCL); Yes, lower (MTCA)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PCE[f]	5	MCL	21	5	5	No	8.9	National WQC (HH)	100	29 (HH)	7.1 (HH)	2.9 (HH)	Yes, lower
1,1,1-TCA	200	MCL	16,000	200	200	No	42,000	MTCA B	930,000	200,000 (HH)	160,000 (HH)	50,000 (HH)	Yes, higher
TCE[d]	5	MCL	4	5	5	No (MCL); Yes, lower (MTCA)	81	National WQC (HH)	4.9 (HH)	7.0 (HH)	0.86 (HH)	0.70 (HH)	Yes, lower

a. Source: ROD Table 7-8 for Area 2 and Table 10-12 for Area 8 (Navy, EPA, and Ecology, 1994). The full ROD includes 15 inorganic chemicals, 22 volatile or semi volatile compounds. In the second FYR, the list of ARARs reported in the FYR tables was reduced to focus on compounds that have been detected and were a part of the LTM of this site.
b. MTCA Method B levels as reported in the Cleanup Levels and Risk Calculation (CLARC) Master Table dated July 2024. CLARC cleanup levels for hazardous waste sites comply with the Model Toxics Control Act (MTCA) Cleanup Regulation, chapter 173-340 WAC as provided in Ecology, 2023.
c. The ROD RG for VC was previously 0.023 µg/L but the PQL of 0.1 µg/L at the time of the ROD was applied.
d. Normally, under MTCA, Ecology would use the MCL of 5 µg/L for TCE as the Method B cleanup level. However, in this case, the new toxicity information indicates the MCL exceeds a hazard quotient of 1. Therefore, under WAC 173-340-720 (7)(b), the MCL must be adjusted downward to 4 ug/L, so that the Method B cleanup level will not exceed a hazard quotient of 1. Thus, 4 ug/L is selected as the Method B groundwater cleanup level instead of the standard risk-based MTCA Method B value of 0.54 µg/L (Ecology, 2019b).
e. In accordance with WAC 173-340-720(3)(a) and 173-340-720(7)(b), the MCL for cis-1,2-DCE is not sufficiently protective when compared to the current MTCA B drinking water values. Therefore, the MCL would no longer be acceptable if cleanup levels were to be established today, i.e., the non-cancer hazard level of the MCL would exceed hazard index of 1.
f. Because the MCL does not exceed a hazard quotient of 1 or a cancer risk of 1 x 10^{-5}, the MCL can be selected as the Method B ground water cleanup level [WAC 173-340-720 (7) (b)]. Thus, the MTCA groundwater cleanup levels are based on the MCL for PCE of 5 µg/L.
g. Differences in water quality criteria for 40 CFR 131.45 reflect changes through EPA rulemaking promulgated in 2022 that reversed previous changes in the draft rule for 2019 (Ecology, 2024b).

Notes:
CFR – Code of Federal Regulations
DCE – dichloroethane
HH – the WQC based on human ingestion of fish in the water body
MCL – maximum contaminant level
µg/L – microgram per liter
MC – marine chronic
MTCA – Model Toxics Control Act
N/A – not applicable
PCE – tetrachloroethene
PQL –- practical quantitation limit
ROD – Record of Decision
TCA – trichloroethane
TCE – trichloroethene
WAC – Washington Administrative Code
WQC – water quality criteria

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6.0 Issues/Recommendations

This section presents the issues and recommendations identified as a result of this FYR process for NBK Keyport. Table 6-1 summarizes the issues (and subsequent recommendations) that affect current and/or future protectiveness of the remedy.

6.1 Other Findings/Recommendations

This section presents other findings and recommendations identified through this FYR process that may improve performance of the remedy, reduce costs, improve management of O&M, accelerate site closeout, conserve energy, and/or promote sustainability, but do not affect the current and/or future protectiveness of the remedy. Table 6-2 summarizes these other findings and subsequent recommendations.

Chemicals of emerging concern are included in this section because for this FYR for NBK Keyport, the presence or absence of chemicals of emerging concern does not affect the protectiveness determination for any OU under review. In Section 7, the remedies for both OUs are found to be not protective based on COCs identified in the RODs and therefore the presence or absence of chemicals of emerging concern do not have the potential to make the remedies less protective.

6.1.1 Per- and Polyfluoroalkyl Substances Investigations

The Navy recognizes PFAS as chemicals of emerging concern. These substances may be present in the soil, groundwater, and/or surface water at Navy sites as a result of historical firefighting activities using Class B foam or aqueous film forming foam (AFFF), in additional to other common industrial uses. AFFF was used for plane crashes, equipment testing, and training, as well as in other operations such as hangars where AFFF was used in fire suppression systems, and plating shops where certain PFAS, namely PFOS, was used as a vapor suppressant on plating baths. The Navy has begun PFAS investigations at NBK Keyport as part of the Navy-wide program to assess its installations for areas where PFAS is suspected to have been stored, used, or released to the environment.

Since 2016, the EPA has changed its guidance for testing and evaluation of PFAS at impacted sites. This has included multiple changes to the RSLs used as benchmarks for human health risk associated with exposure through drinking water and soil contact. In 2024, the EPA updated the risk information supporting the soil and groundwater RSLs for the seven (7) PFAS included in the PFAS SI for NBK Keyport, as well as adding RSLs for an additional six (6) PFAS (PFDA, PFDoDA, PFODA, PFPrA, PFTetDA, and PFUDA). The EPA has additionally proposed changes to toxicity information for PFHxS and PFNA that may affect future changes to the RSLs and the interpretation of data

collected in the PFAS SI. The conclusions of previous PFAS investigations are summarized below with their interpretation of the RSLs available at the time the respective reports were published.

The following investigations have been conducted at NBK Keyport to date:

- 2018 and 2019 PFAS sampling at OU 1 and OU 2 Area 8 as part of the LTM sampling program (Navy, 2019b, 2020g).
- Basewide PFAS PA (Navy, 2020e)
- 2021 PFAS sampling at OU 1 (Navy, 2023c)
- Basewide PFAS SI (Navy, 2023j)

2018 and 2019 Sampling. Results of the 2018 and 2019 PFAS sampling are summarized for OU 1 and OU 2 Area 8 in the respective LTM reports (Navy, 2019b, 2020g) as well as the fifth FYR (Navy, 2020a). The sampling verified the presence of PFAS in groundwater at these sites.

Basewide PFAS PA. The basewide PFAS PA was conducted in 2020,with the purpose of initially identifying potential or actual PFAS sources (i.e., areas of interest) at NBK Keyport based on existing information regarding current and historical activities at this installation (Navy, 2020e). Ten areas considered potential PFAS source areas were evaluated. Nine (9) areas were identified as likely sources of PFAS-containing materials; these areas and the rationale for each of those areas are provided in Section 5 of the PFAS PA (Table 5-1; Navy, 2020e). Seven (7) of the nine (9) areas identified as likely PFAS sources in the PFAS PA were recommended to be assessed in the PFAS SI. The remaining two (2) areas (OU 1 and OU 2 Area 8) were recommended to move directly to the RI stage (Navy, 2020e). Therefore, OU 1 and OU 2 Area 8 were not included in the PFAS SI. The seven (7) areas assessed in the PFAS SI, as well as the two (2) areas recommended to move directly to RI, are shown on Figure 6-1, a basewide PFAS site location map.

2021 Sampling. In 2021, groundwater sampling was conducted at 60 wells at OU 1. Results were screened against May 2022 RSLs for the PFAS analytes that had an RSL at that time. One (1) well, MW1-06, had concentrations of PFOS (0.16 J μg/L) and PFOA (0.12 J μg/L) above the RSLs of 0.0040 μg/L and 0.0060 μg/L, respectively (Navy, 2023c). The location of MW1-06 is shown on Figure 4-4.

Basewide PFAS SI. The PFAS SI was completed at seven (7) areas of potential concern (AOPCs) at NBK Keyport in 2023 (Navy, 2023j). The objectives included determining whether PFAS are present in groundwater and soil at concentrations warranting further investigation and refining the understanding of the hydrogeologic

characteristics at potential PFAS source areas and evaluating the potential for on- and off-Base migration of PFAS, if present.

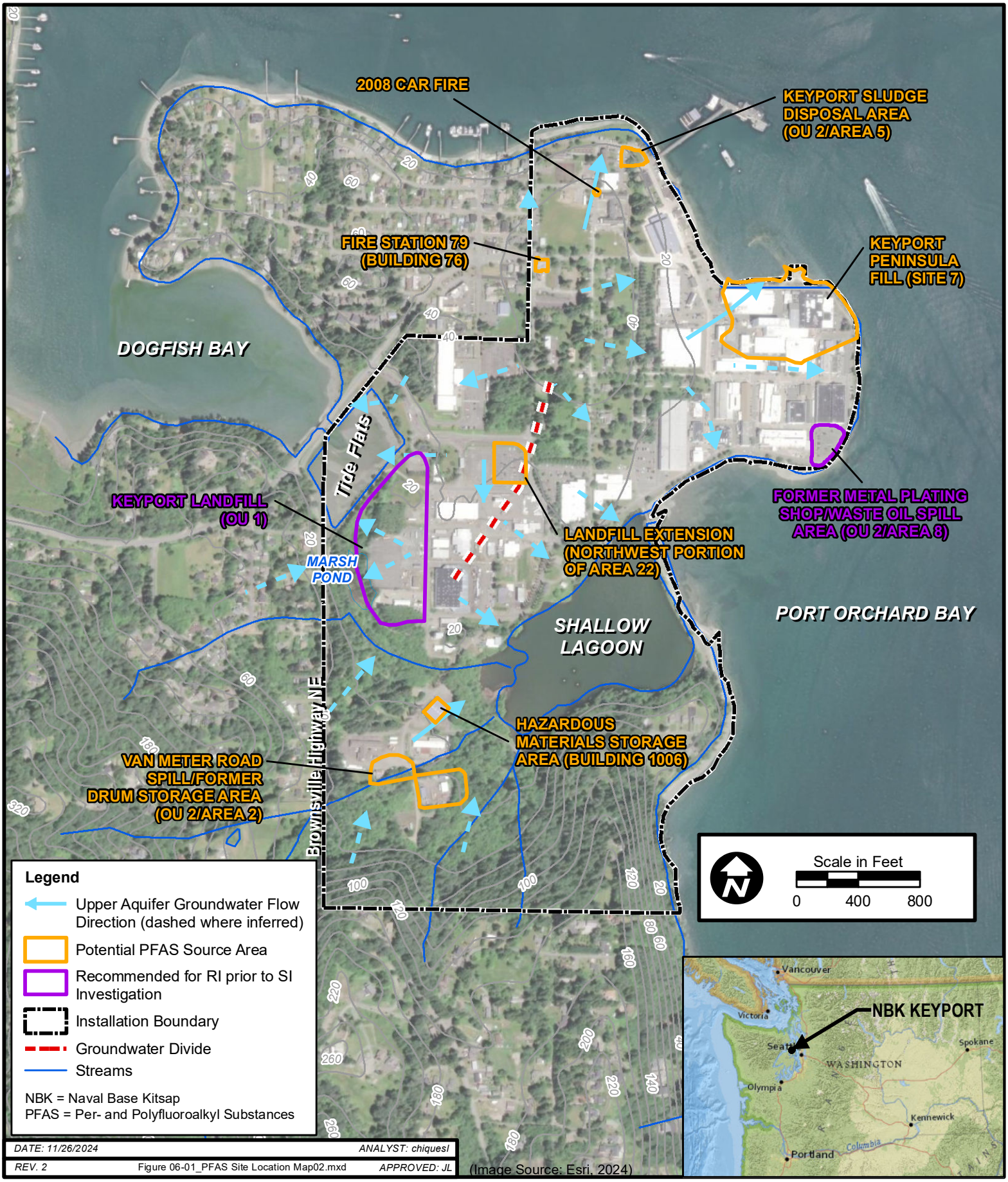
Several PFAS compounds were present in soil and/or groundwater at the AOPCs at NBK Keyport. Five (5) of the seven (7) AOPCs evaluated in the PFAS SI contained PFAS in soil and/or groundwater at concentrations above the November 2022 EPA RSLs. These five (5) areas were recommended for further investigation in the RI phase of the CERCLA process. The other two (2) areas were recommended for no further investigation (Navy, 2023j). PFAS were not detected in drinking water samples collected by the Navy during pre-SI sampling of the on-Base Navy water supply wells or by KPUD during sampling of their off-Base water supply wells.

Table 6-3 provides a description of the AOPCs and summarizes the PFAS SI results, where applicable, as well as recommendations from the PFAS PA and/or PFAS SI at NBK Keyport. Including OU 1 and OU 2 Area 8, a total of seven (7) AOPCs will be evaluated in the future PFAS RIs.

Although PFAS have been detected in groundwater at NBK Keyport during this FYR period, there have been no new human health pathways identified through which exposure could occur. At areas identified in existing RODs, LUCs restricting groundwater use for drinking water are in place. For other areas, the Navy has added the PFAS areas of interest identified in the PFAS SI to the Navy's geographic information system (GIS) maps, which are widely accessible within the Navy and used for construction project planning. While groundwater within 1 mile of one (1) or more of these sites is used as a source of drinking water, it is unlikely that a complete exposure pathway from the potential PFAS source to drinking water sources off the facility would exist because of the depth of existing public water supply wells and a lack of connectivity between the upper (impacted) and lower (unimpacted) aquifers. The Navy's excavation outage/permit process would be triggered by any proposal to drill any new drinking water wells anywhere on base, and this process includes a review by the NAVFAC Northwest RPM, who would pre-empt any attempted to drill a drinking water well that could be impacted by PFAS. The Navy is currently progressing through the CERCLA process for this group of chemicals, and data are still being collected to assess:

- The nature and extent of PFAS at NBK Keyport
- Potential/new migration pathways
- Potential effects of PFAS on ecological receptors
- Potential human exposure pathways
- The cumulative risk of PFAS and other COCs present at the OUs

The presence of PFAS at the sites with remedies in place and evaluated in this FYR (i.e., OU 1, OU 2 Area 2, and OU 2 Area 8) does not influence the protectiveness determination for the remedies. The remedies at OU 1 and OU 2 Area 8 are already concluded to be not protective because of unacceptable human health or ecological risks resulting from exposures to legacy COCs (see Section 7.0). The Navy's approach to addressing these unacceptable risks from legacy COCs will include consideration of the PFAS present at these sites. The remedy at OU 2 Area 2 is short-term protective for legacy contaminants and for PFAS as long as LUCs preventing exposure to groundwater remain in place. The CERLCA process underway at other sites (i.e., those without RODs or remedies in place for legacy COCs) will ultimately determine if selection of a remedy for those sites is necessary.



U.S. NAVY	Figure 6-1 PFAS Site Location Map	NBK KEYPORT SIXTH FIVE-YEAR REVIEW

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Table 6-1. Issues and Recommendations Identified in the Five-Year Review

<table>
<tr><th colspan="5">Issues/Recommendations</th></tr>
<tr><td>OUs: 1</td><td colspan="4">Issue Category: Remedy Performance</td></tr>
<tr><td></td><td colspan="4">Issue: Investigations pursuant to recommendations from the fourth and fifth Five-Year Reviews (FYRs; United States [U.S.] Navy, 2015a, 2020a) have resulted in an updated conceptual site model (CSM) that differs significantly from the understanding at the time of the Operable Unit (OU) 1 Record of Decision (ROD; Navy, U.S. Environmental Protection Agency [EPA], and Washington State Department of Ecology [Ecology], 1998) and continuing investigations are likely to conclude that unacceptable risks to human health and the environment are not being fully controlled by the remedy in place.</td></tr>
<tr><td></td><td colspan="4">Recommendation:
1. Complete the on-going investigations to update the CSM elements for off-base transport of contaminants of concern (COCs).
2. Perform additional sampling of deep groundwater wells throughout OU 1 with analysis for polychlorinated biphenyl (PCB) congeners to confirm or refute the presence of PCBs as a COC in deep groundwater.
3. Finalize the updates to the human health and ecological risk assessments using the updated CSM and incorporating the latest guidance and screening levels.
4. In collaboration with the Keyport Project Team, review and revise (as appropriate) the applicable or relevant and appropriate regulations (ARARs), points of compliance, and remedial action objectives (RAOs) as part of a focused feasibility study (FFS).
5. Based on the results of items 1 through 3, evaluate the need for any removal actions and/or an optimized/revised remedy.</td></tr>
<tr><td>Affect Current Protectiveness</td><td>Affect Future Protectiveness</td><td>Party Responsible</td><td>Oversight Party</td><td>Milestone Date</td></tr>
<tr><td>Yes</td><td>Yes</td><td>Navy</td><td>Ecology</td><td>December 2027</td></tr>
<tr><td>OUs: 1</td><td colspan="4">Issue Category: Remedy Performance</td></tr>
<tr><td></td><td colspan="4">Issue: The suspension of long-term monitoring (LTM) and contingent remedial action (CRA) monitoring activities has been in effect for 7 years while supplemental remedial investigation (RI) activities have been ongoing, although sampling in support of these activities has met or exceeded the historical LTM requirements.</td></tr>
<tr><td></td><td colspan="4">Recommendation: Begin developing a revised LTM/CRA Plan concurrent with finalization of Volume 3 of the supplemental RI, and modify that plan based on any final results. Implement the LTM plan promptly once all relevant data are available.</td></tr>
<tr><td>Affect Current Protectiveness</td><td>Affect Future Protectiveness</td><td>Party Responsible</td><td>Oversight Party</td><td>Milestone Date</td></tr>
<tr><td>No</td><td>Yes</td><td>Navy</td><td>Ecology</td><td>December 2026</td></tr>
<tr><td>OUs: 1</td><td colspan="4">Issue Category: Remedy Performance</td></tr>
<tr><td></td><td colspan="4">Issue: The phytoremediation component of the remedy is no longer functioning as intended by the OU 1 ROD and as the trees reach the end of their lives they present a hazard to workers at the site. The OU 1 ROD provides for the discontinuation of this remedy component in the event that it is shown to be ineffective.</td></tr>
<tr><td></td><td colspan="4">Recommendation:
1. Evaluate the OU 1 ROD to confirm that removal of the phytoremediation trees prior to selection of a revised remedy is allowable.
2. If allowable, to protect site workers from physical hazards, consider cutting the phytoremediation trees at their bases and either consolidating the trunks and limbs in an unused area to remove the tripping hazards, or removing the trees from Naval Base Kitsap (NBK) Keyport entirely. Stumps can be addressed as part of a future remedy optimization, although some resprouting is likely to occur from the stumps. Discontinue associated phytoremediation monitoring.</td></tr>
<tr><td>Affect Current Protectiveness</td><td>Affect Future Protectiveness</td><td>Party Responsible</td><td>Oversight Party</td><td>Milestone Date</td></tr>
<tr><td>Yes</td><td>Yes</td><td>Navy</td><td>Ecology</td><td>December 2025</td></tr>
</table>

Table 6-1 (continued). Issues and Recommendations Identified in the Five-Year Review

Issues/Recommendations				
OUs: 1	Issue Category: Land Use Controls			
	Issue: The existing WDOH restrictions on shellfish harvesting and consumption are currently preventing human health exposures to seafood harvesters while the ROD amendment process is underway; however, there is no site contaminant-related restrictions.			
	Recommendation: Coordinate with WDOH and the Suquamish Tribe regarding the findings of the HHRA/ERA, the status of WDOH shellfish area classifications in Liberty Bay, and future risk/harvest management decisions.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
Yes	Yes	Navy	Ecology	December 2025
OUs: 2, Area 2	Issue Category: Remedy Performance			
	Issue: The additional monitoring wells installed during this FYR period show concentrations of trichloroethene (TCE) several times higher than the highest concentrations documented in the OU 2 ROD, even after 30 years of monitoring with the expectation of natural attenuation. The new wells installed may not be optimally positioned to assess whether migration pathways are known, and exposures controlled.			
	Recommendation: Comprehensively evaluate the data collected in 2022, 2023, and 2024, as well as the planned drum investigation data, to refine the CSM, including: 1. Verification that the leading edge of the chlorinated volatile organic compound (cVOC) plume, both laterally and vertically has been delimited, or performance of additional investigation as warranted. Consider the specific investigation recommendations included in Section 4.2.2. 2. Verification that monitoring wells are correctly positioned and screened to assess whether migration pathways are being monitored, or installation of additional wells as needed to provide such monitoring points. 3. Evaluation of the 2024 biodegradation data to conclude whether the natural attenuation anticipated and described in the OU 2 ROD is reasonably expected to meet the RAOs. 4. Incorporation of a complete suite of cVOC breakdown compounds and natural attenuation parameters in future monitoring.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	Navy	Ecology	December 2027
OUs: 2, Area 8	Issue Category: Remedy Performance			
	Issue: As also found in the fifth FYR, based on the ERA conclusion that acute and chronic exposure to accumulated contaminants in sediment poses a current potential hazard to benthic organisms based on the bioassay results/endpoints implementation of a contingent groundwater control action is required by the selected remedy (Navy, EPA, and Ecology, 1994).			
	Recommendation: Continue progress towards implementation of a contingent groundwater control action. To identify a feasible contingent action, finalize the supplemental RI and perform a FFS. Once identified and agreed upon by regulators and stakeholders, prepared a ROD amendment to document the contingent action to be taken. Perform remedial design, implement the remedial action, and potentially conduct a shoreline repair to address elevated COC concentrations in intertidal sediment and on-going discharge of these COCs in seep water.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
Yes	Yes	Navy	Ecology	December 2030

Table 6-1 (continued). Issues and Recommendations Identified in the Five-Year Review

OUs: 2, Area 8	Issue Category: Protectiveness			
	Issue: During preparation of the work-in-progress supplemental RI, substantial additional data were generated for chemical concentrations in soil and groundwater in the terrestrial portions of the site; however, data were not available in a final report for assessment in this FYR.			
	Recommendation: Once these data are available in a finalized report, perform an assessment to determine whether the remedy for the terrestrial portion of the site remains protective of human health and the environment.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	Navy	Ecology	December 2030

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Table 6-2. Other Findings and Recommendations Not Affecting Protectiveness

Other Finding/Recommendation	
OU 1	Finding Category: Institutional Controls
	Finding: During annual LUC inspections and the FYR site inspection, several cracks have been consistently observed in the asphalt pavement of the Central Landfill. Also, alder trees and other brush are growing up through penetrations in the asphalt pavement near old foundations in the southern portion of the Central Landfill.
	Recommendation: Incorporate landfill venting and cover upgrades in future FFS evaluations and remedy optimization to address potential risks from methane migration beyond the landfill boundaries and prevent direct contact with the underlying soils in the future, respectively.
OU 1	Finding Category: Data Evaluation
	Finding: Analytical data have been generated and evaluated after publication of the Volume 1 supplemental RI that expand the understanding of the site presented in the CSM included in the Volume 1 supplemental RI. These data include results for over 300 samples of soil, surface water, sediment, shellfish tissue, and plant tissue in support of the Volume 2 supplemental RI, and additional soil and groundwater samples and geophysical survey data collected in support of the Volume 3 the supplemental RI.
	Recommendation: Integrate the data collected during the HHRA/ERA with the data presented in Volume 1 of the supplemental RI and data collected in support of the pending Volume 3 of the supplemental RI to prepare an update to the CSM presented as Section 3.1 of the Volume 1 supplemental RI.
OU 1	Finding Category: Remedy Optimization
	Finding: Potential sea level rise and extreme weather impacts do not affect the protectiveness of the remedy at this time but should be considered as part of any assessment of optimization alternatives.
	Recommendation: Include in the future FFS a resiliency assessment for alternatives considered as potential revised remedy(ies) for OU 1.
OU 1	Finding Category: Monitoring
	Finding: ISM sampling of PCBs in sediment near and downstream of seep SP1-1 has helped to understand the distribution and migration of PCBs in the most downstream reach of Marsh Creek up to the point of discharge through the tide gate to the Tide Flats. However, a larger dataset is needed to provide a baseline from which to assess potential ongoing recontamination of this area over time.
	Recommendation: Perform at least annual ISM sampling of PCBs in sediment following the procedures and decision unit definitions used in previous sampling for at least three additional years. Use these data to draw conclusions regarding potential ongoing recontamination of this area over time.
OU 2	Finding Category: Monitoring Data
	Finding: Existing groundwater monitoring data were collected across several days and do not allow evaluation of groundwater flow patterns.
	Recommendation: Collect tidal stage data along with roughly time-coincident depth to groundwater measurements from all available groundwater monitoring wells in the vicinity of OU 2 Area 2 during both wet and dry seasons to update the understanding of groundwater flow. If pressure transducer data loggers are available, consideration should be given to collecting continuous groundwater elevation data for six (6) months to allow assessment of seasonal and potential tidal variations in groundwater flow direction and gradient.
OU 2	Finding Category: Remedy Optimization
	Finding: Potential sea level rise and extreme weather impacts do not affect the protectiveness of the remedy at this time but should be considered as part of any assessment of optimization alternatives.

Table 6-2 (continued). Other Findings and Recommendations Not Affecting Protectiveness

Other Finding/Recommendation	
	Recommendation: Include in the future FFS a resiliency assessment for alternatives considered as a potential revised remedy for OU 2 Area 8.
Sitewide	Finding Category: Chemicals of Emerging Concern
	Finding: PFAS concentrations in environmental media identified to date at NBK Keyport warrant additional investigation.
	Recommendation: Perform planned RIs for PFAS at the sites recommended by the SI.

Table 6-3. Preliminary Assessment and Site Inspection Results and Recommendations

AOPC	Description	PA Recommendation	SI Results	SI Recommendation
Building 76 – Fire Station	Transfer and storage of AFFF from at least 1980s to present. Undocumented minor spills and splashed reportedly occurred during transfer. Training occurred approximately annually in the 1980s on the Bldg. 76 fire truck ramp.	Site Inspection	PFBS, PFHxS, and PFOA present in groundwater. PFOA concentrations exceeded the SL in three wells. PFOS was present in soil at concentrations that exceeded SLs in two (2) borings at 3 ft depth.	Remedial Investigation
Building 1006 –	Contains an AFFF fire suppression system with 1,000 gallons of AFFF (two 500-gal steel bladder tanks). Releases reported in 2011 and 2015, one (1) involved discharge of 5 gallons of AFFF concentrate into an open utility ditch.	Site Inspection	PFOA, PFOS, PFNA, and PFHxS present in groundwater at concentrations above SLs in four (4) wells (PFOS) and one (1) well (PFOA, PFNA, and PFHxS). PFOS present in soil at concentrations above the SL in two (2) surface sample locations.	Remedial Investigation
2008 Car Fire	Approximately 0.5 gallons of AFFF concentrate, along with water, was used to extinguish the car fire. AFFF and water were reportedly not contained using secondary containment. A grass-covered drainage ditch is present downslope from the discharge location.	Site Inspection	PFOA, PFOS, PFHxS present in groundwater at concentrations that exceed SLs in three (3) wells (PFOS) and two (2) wells (PFOA and PFHxS). PFOA, PFOS, and PFNA present in soil at concentrations below SLs.	Remedial Investigation
Building 825 – Waste Treatment Facility	Waste treated in this building was from industrial buildings at NBK Keyport that may have contained PFAS. There were no historical or documented releases within the treatment facility.	No Further Action	Not investigated	
Keyport Landfill (OU 1)	PFAS was detected in groundwater collected during the 2018 LTM event. The landfill was in use during the time when AFFF was known to be used by the Navy. Other PFAS-containing waste not associated with AFFF could also have been disposed in the landfill.	Remedial Investigation	Not investigated	
Keyport Peninsula Fill (Site 7)	PFAS was detected in groundwater collected during the 2018 LTM event at OU 2 Area 8 which is adjacent to Site 7 PFAS-impacted materials used as fill at Site 7 may have been released directly into the subsurface and could have potentially leached into the unconfined upper aquifer.	Site Inspection	PFBS and PFOA present in groundwater at concentrations below the SLs in one (1) well. PFOS present in soil at concentrations below the SLs in two (2) surface sampling locations. No COPCs identified in the human health risk screening (HHRS).	No Further Action
Landfill Extension (Northeast Portion of Area 22)	This area is believed to have been used as an unofficial disposal area for waste generated from the 1930s to late 1960s. No records or anecdotal evidence were available for review that	Site Inspection	No PFAS analytes were detected in groundwater. PFOS present in soil at a concentration below the SL in one (1) location. No	No Further Action

Table 6-3 (continued). Preliminary Assessment and Site Inspection Results and Recommendations

AOPC	Description	PA Recommendation	SI Results	SI Recommendation
	confirmed that AFFF or other PFAS-containing chemicals were or were not disposed in this area. However, the landfill was in use when AFFF was known to be used by the Navy and other PFAS-containing waste not associated with AFFF could also have been disposed in the landfill.		COPCs were identified in the HHRS.	
Keyport Sludge Disposal Area (OU 2 Area 5)	From the 1940s through the mid-1970s, up to 5,000 gallons of sanitary and industrial sludge from the sewage treatment plant was disposed of in this area. PFAS may have been used in some of the industrial process (e.g., metal plating); and therefore, may have been directly released to the environment at this location.	Site Inspection	PFOA and PFOS present in groundwater at concentration above SLs in two (2) wells. PFOS present in soil at concentrations below SL.	Remedial Investigation
Former Metal Plating Shop/ Waste Oil Spill Area (OU 2 Area 8)	PFAS was detected in groundwater samples collected during the 2018 LTM sampling event at OU 2 Area 8. PFAS may have been used in the metal plating process. While operational, the Former Metal Plating Shop had multiple large spills including chrome plating solution, plating wastes, solvents, and petroleum hydrocarbons, some of which could potentially contain PFAS.	Remedial Investigation	Not investigated	
Van Meter Road Spill/Former Drum Storage Area (OU 2 Area 2)	The drum storage area was operational from the 1940s to the 1960s. While operational, unused material was reportedly dumped directly onto the ground surface from partially filled drums. Any chemicals, solvents, fuels, and oils used at NBK Keyport that came in 55-gallon drums could have contributed to PFAS impacts in this area. In total, an estimated 4,000 to 8,000 gallons of waste was discharged in this area. No records or anecdotal evidence that AFFF or other PFAS-containing chemicals were or were not disposed of, stored, or released in this area. However, the drum storage area was in use when AFFF was known to be used by the Navy. In addition, other waste containing PFAS not related to AFFF could have been stored or disposed of in this area.	Site Inspection	PFOA, PFOS, and PFHxS present in groundwater at concentrations above the SLs in four (4) wells. PFOS present in soil at a concentration above the SL at one (1) surface sample location.	Remedial Investigation

7.0 Protectiveness Statement

This section presents the protectiveness determinations and statements as a result of this sixth FYR for NBK Keyport. Table 7-1 lists the individual protectiveness determinations and statements for OU 1 and OU 2. Table 7-2 provides the sitewide protectiveness determination and statement for NBK Keyport for this FYR period.

As detailed in Section 6.0, additional or contingent actions are being conducted and/or planned for OU 1 and OU 2 to ensure protection of human health and the environment.

Table 7-1. Protectiveness Statements for OU 1 and OU 2 at NBK Keyport

Protectiveness Statement(s)	
Operable Unit: 1	Protectiveness Determination: Not Protective
Protectiveness Statement: The remedy at OU 1 is not protective. Exposure pathways identified in the OU 1 ROD that could result in unacceptable risks are being controlled and monitored via LUCs while further information is being obtained. However, substantial investigation work was conducted during this FYR period focused on updating the conceptual site model and reassessing potential risks to human health and the environment. This work is ongoing, but data and evaluations to date document substantial changes to the CSM and the risk conclusions presented in the OU 1 ROD. The HHRA/ERA addendum that is likely to be finalized shortly after the review period for this FYR is expected to show unacceptable risks not identified in the OU 1 ROD to both human and ecological receptors. Human health risks are primarily driven by exposure to COCs in sediment, surface water, and through consumption of shellfish. COCs in sediment and pore water occur at higher concentrations than previously understood and present a potential pathway for unacceptable risk for ecological receptors at OU 1. The ongoing supplemental RI will provide the data to allow evaluation of potential additional removal or remedial action(s) under a FFS that could be taken to address these risks, shorten the overall restoration timeframe, and be protective in the long term.	
Operable Unit: 2 (Area 2 and Area 8)	Protectiveness Determination: Not Protective
Protectiveness Statement: Overall, OU 2 is not protective because the remedy at Area 8 is not protective of ecological receptors. The remedy at OU 2 Area 2 is short-term protective. Known exposure pathways that could result in unacceptable risks are being controlled and monitored via LUCs. However, the additional monitoring wells installed during this FYR period show concentrations of TCE several times higher than the highest concentrations documented in the OU 2 ROD, even after 30 years of monitoring. The new wells installed may not be optimally positioned to reliably assess whether migration pathways are known and exposures controlled. The remedy at OU 2 Area 8 is protective of human health; however, it is not protective of ecological receptors based on a finding of unacceptable risk, for which a contingent remedial action has not yet been implemented as required by the OU 2 ROD. To identify a feasible contingent groundwater control action, the Navy is currently performing a supplemental RI, and supporting bench-scale studies, and will be initiating a FFS in the near future. Once identified, and agreed upon by regulators and stakeholders, the Navy will document the selected contingent groundwater control action in a ROD amendment. The Navy will then perform remedial design, implement additional remedial action to address elevated COC concentrations in intertidal sediment and on-going discharge of these COCs in seep water. A ROD amendment will be prepared to document the contingent groundwater control action taken. The human health risk assessment at the Area 8 beach intertidal zone concluded that, despite the presence of several COCs in the beach sediment and clam tissue at concentrations exceeding background and reference area concentrations, the incremental site risk over reference area risk for Suquamish subsistence and recreational receptors meets target health goals. The ecological risk assessment concluded that there was no risk to higher trophic level species, but acute and chronic exposure to accumulated contaminants in sediment pose a current potential hazard to benthic organisms based on the bioassay results/endpoints.	

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Table 7-2. Sitewide Protectiveness Statement for NBK Keyport

Sitewide Protectiveness Statement
Protectiveness Determination: Not Protective
Protectiveness Statement: The remedies at NBK Keyport are not protective. Additional post-ROD investigations at OU 1 have identified substantially higher contaminant concentrations distributed more widely both laterally and vertically, and new exposure pathways that are likely to represent unacceptable risks. At OU 2 Area 8 the contingent remedial action has not yet been implemented to address the demonstrated unacceptable ecological risk. OU 2 Area 2 is short term protective, but the remedy is not functioning as intended by the OU 2 ROD and all potential exposure pathways may not be controlled.

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8.0 Next Review

The next FYR report is required for OU 1 and OU 2 at NBK Keyport and should be completed by late 2030, which will be five years from the completion date of this review.

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Appendix A: NOTICE OF INTENT PROOF OF PUBLICATION

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State of Wisconsin

Naval Base Kitsap Keyport
Invites You to Participate in the
Sixth Five-Year Review of Cleanup Actions
August 2019 to July 2024

This notice is to inform the public that the United States Department of the Navy (Navy) is initiating the sixth five-year review of environmental cleanup actions at Naval Base Kitsap (NBK) Keyport, in cooperation with the U.S. Environmental Protection Agency (EPA) and the Washington State Department of Ecology. The purpose of the five-year review is to ensure that the cleanup actions (remedies) continue to be protective of human health and the environment. These cleanup actions were established in Records of Decision (RODs) prepared under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The five-year review is required under federal law because the cleanup actions have left some contamination in place.

Site Name, Location, and Address:
Naval Undersea Warfare Center
Keyport, Washington

Lead Agency Conducting the Review:
United States Navy

The Naval Undersea Warfare Center, now referred to as NBK-Keyport, was added to the National Priorities List (NPL) in October 1989. Cleanup actions have been conducted at several areas within NBK-Keyport Operable Units (OUs) 1 and 2 where environmental contamination was identified in the past. OU 1 consists of Area 1 (the former base landfill), and OU 2 consists of the remaining areas of concern (Areas 2, 3, 5, 8, and 9). These sites have undergone environmental investigation and/or remediation to address the potential impacts of contamination to human health and the environment. Based on initial evaluation and investigations, Areas 3, 5, and 9 have been issued "No Further Action" determinations by EPA, as documented in the OU 2 ROD.

The remedy for Area 1, OU 1 consists of treatment of volatile organic compound (VOC) hot spots in the landfill using phytoremediation by poplar trees in concert with natural attenuation; removal of polychlorinated biphenyl (PCB)-contaminated sediments; upgrade of the tide gate and landfill cover; implementation of institutional controls; and conducting long-term monitoring.

The remedy for Area 2, OU 2 consists of institutional controls and groundwater monitoring of VOCs.

The remedy for Area 8, OU 2 includes removal and off-site disposal of metals-impacted soil above the groundwater table, implementation of institutional controls, and long-term monitoring of groundwater, sediment, and marine biota.

An initial statutory five-year review was finalized in 2000, and subsequent five-year reviews were finalized in 2005, 2010, 2015, and 2020.

Site-specific information and links to documents, such as RODs, are available on the following Navy website: https://pacific.navfac.navy.mil/Facilities-Engineering-Commands/NAVFAC-Northwest/Our-Services/Environmental-Stewardship/Environmental-Restoration/Naval-Base-Kitsap-Keyport/.

The Navy welcomes comments from the community during the five-year review process; comments will be accepted until October 31, 2024. Comments received from community members will be acknowledged and addressed in the sixth five-year review report. A Notice of Completion for the sixth five-year review at NBK Keyport is anticipated to be published in local newspapers by the end of 2025, and the final report will be posted on the Navy website listed above.

For more information or to provide comments, please contact:
Naval Facilities Engineering Systems Command Northwest
Public Affairs Office
Phone: (360) 340-5592
Email: navfacnwpao@us.navy.mil

Anticipated Date of Five-Year Review Completion: December 2025

No.10495768 Aug. 29, 30, Sept. 1, 2024

Appendix B: COMPLETED INTERVIEW RECORDS

Sixth Five-Year Review Interview Record
Naval Base Kitsap Keyport
Keyport, Washington

CONTACT INFORMATION

Name: Benjamin Leake	
Title: Remedial Project Manager	**Association to NBK Keyport:** EPA Project Manager
Organization: USEPA, Region 10	**Years of Association:** 2
Telephone: [redacted]	**Email:** leake.benjamin@epa.gov
Contact Made By: Jody Lipps, Battelle	**Date:** 9/12/2024

QUESTIONNAIRE

1. Please describe your degree of familiarity with the Naval Base Kitsap (NBK) Keyport Records of Decision (RODs) for Operable Units (OUs) 1 and 2; the implementation of the remedies at these OUs; the monitoring and maintenance that has taken place since implementation of the remedies; and recommendations made during the fifth five-year review (FYR) finalized in 2020. For reference OU 1 includes only one active site, whereas OU 2 includes two active sites, as follows:

OU 1 – Former Base Landfill

OU 2 Area 2 – Van Meter Spill and Drum Storage Areas

OU 2 Area 8 – Former Plating Shop

Response:

I am very familiar with the CERCLA work at Keyport.

2. What is your overall impression of the on-going effectiveness of the components of the OU 1 remedy? For reference, the primary remedy components are:

- Phytoremediation at the former landfill using hybrid poplar trees
- Removal of polychlorinated biphenyl (PCB)-contaminated sediments from the marsh
- Upgrade of the tide gate
- Upgrade and maintenance of the landfill cover
- Long-term monitoring
- Contingent actions for off-base domestic wells
- Institutional controls

Response:

The phytoremediation aspect of the OU1 remedy is ineffective. The removal of PCB-contaminated sediments was helpful, but the latest monitoring data indicates that more work is likely required. A supplemental remedial investigation is underway to develop a revised remedial approach.

3. What is your overall impression of the on-going effectiveness of the components of the OU 2 remedy? For reference, the primary remedy components are:

- Institutional controls and groundwater monitoring at Area 2
- Excavation and off-site disposal of vadose-zone soil at Area 8
- Institutional controls and monitoring of groundwater, sediments, and shellfish at Area 8

Response:

Institutional controls and monitoring are satisfactory in OU2, and the excavation of soils at Area 8 was beneficial. However, the Area 8 remedy is not achieving remedial action objectives and a supplemental remedial investigation is underway. Two abandoned drums were discovered in Area 2, and are currently being investigated as well.

3. The phytoremediation component of the OU 1 remedy is not operating as anticipated. The Navy has been performing additional investigations, so far resulting in publication of volume 1 of a supplemental RI in support of possible actions to shorten the restoration timeframe and improve the remedy performance. What is your impression of the progress toward reassessing this component of the remedy?

Response:

Work on the supplemental remedial investigation in OU1 is progressing well. Although a quicker pace is always the goal, the project is taking a thorough and deliberate approach to completely investigate the area to ensure a protective remedy is selected and implemented.

4. To the best of your knowledge, has the on-going program of institutional controls inspections and environmental monitoring at OUs 1 and 2 been sufficiently thorough and frequent to meet the goals of the RODs? Have the monitoring data been timely and of acceptable quality? Please indicate the basis for your assessment.

Response:

Yes, in general, the monitoring program has been acceptable based on my reviews of the monitoring reports. There have been some challenges with laboratories and sample handling, but these have not been widespread enough to change the conclusions drawn from the data.

5. To the best of your knowledge, have the recommendations made during the fifth FYR been adequately implemented/ incorporated into the remedy operation, maintenance, and monitoring program? Please indicate the basis for your assessment.

Response:

The issues identified in the fifth FYR are currently being addressed. They have not been completed, but measurable progress is being made on all fronts based on my reviews of submitted reports and engagement in monthly project meetings.

6. What is your overall impression of meeting the recommendations from the fifth FYR?

Response:

I believe the project team is taking the appropriate steps to meet the recommendations from the fifth FYR. The timelines proposed in that FYR were somewhat optimistic, so even though these actions have not been completed yet, the project is on the right path toward completing them.

7. What do you see as major accomplishments for OUs 1 and 2 since the fifth FYR?

Response:

The supplemental remedial investigation in OU1 is the biggest accomplishment since the fifth FYR. Although more work remains, this has been a monumental reevaluation of the site CSM and risks and marks real progress in the cleanup work.

Likewise, the supplemental RI work in OU2 Area 8 is also a major accomplishment. Although that work is behind the OU1 SRI, it still represents a significant workload and technical challenge for remediation.

Additionally, across the site, the initial investigation into potential PFAS contamination has been a major accomplishment.

8. Are you aware of any Tribal or community concerns regarding implementation of the remedies at OUs 1 and/or 2? If so, please give details.

Response:

I believe the Tribes are concerned with the slow pace of the work. Although I understand the reasons for the pace, accelerating the schedule is a goal for this project.

I am not aware of any community concerns.

9. Are you aware of, and do you feel well informed about additional investigations that have occurred at OU 1 and OU 2 Areas 2 and 8 over the past five years? Please elaborate.

Response:

I do feel well informed about the progress at the site. The project team holds regular meetings and the Navy staff is excellent at maintaining open and honest communication with stakeholders.

10. To the best of your knowledge, since June 2019, have there been any new scientific findings that relate to potential site risks that might call into question the protectiveness of the remedies?

Response:

The increased understanding of, and focus on, potential PFAS contamination across the nation is prompting investigations into that contaminant at Keyport. Remedial investigations into PFAS contamination will begin soon and will need to evaluate risks in the existing OUs.

Although some investigation into 1-4 Dioxane was completed during the last FYR period, additional work on that contaminant is also underway.

11. Since June 2019, have there been any complaints, violations, or other incidents related to NBK Keyport installation restoration that required response by your office? If so, please provide details of the event(s) and results of the response(s).

Response:

I am not aware of any complaints, violations, or other incidents requiring a response from my office.

12. Do you have any other comments, concerns, or suggestions regarding the effectiveness of the cleanup measures implemented so far in protecting human health and the environment at NBK Keyport?

Response:

No.

Sixth Five-Year Review Interview Record
Naval Base Kitsap Keyport
Keyport, Washington

CONTACT INFORMATION

Name: Michael Cronin	
Title: Hyrogeologist (in training)	**Association to NBK Keyport:** Site Manager
Organization: Washington Department of Ecology	**Years of Association:** ~1 year
Telephone: [redacted]	**Email:** Michael.Cronin@ECY.WA.GOV
Contact Made By: Jody Lipps (AECOM)	**Date:** 10/10/2024

QUESTIONNAIRE

1. Please describe your degree of familiarity with the Naval Base Kitsap (NBK) Keyport Records of Decision (RODs) for Operable Units (OUs) 1 and 2; the implementation of the remedies at these OUs; the monitoring and maintenance that has taken place since implementation of the remedies; and recommendations made during the fifth five-year review (FYR) finalized in 2020. For reference OU 1 includes only one active site, whereas OU 2 includes two active sites, as follows:

OU 1 – Former Base Landfill

OU 2 Area 2 – Van Meter Spill and Drum Storage Areas

OU 2 Area 8 – Former Plating Shop

Response:

Very familiar

2. What is your overall impression of the on-going effectiveness of the components of the OU 1 remedy? For reference, the primary remedy components are:

- Phytoremediation at the former landfill using hybrid poplar trees
- Removal of polychlorinated biphenyl (PCB)-contaminated sediments from the marsh
- Upgrade of the tide gate
- Upgrade and maintenance of the landfill cover
- Long-term monitoring
- Contingent actions for off-base domestic wells
- Institutional controls

Response:

OU1 remedy is not working as designed. The Keyport Team is actively working on gathering the information required to evaluate new remedies or modifications to the existing remedy.

3. What is your overall impression of the on-going effectiveness of the components of the OU 2 remedy? For reference, the primary remedy components are:

- Institutional controls and groundwater monitoring at Area 2
- Excavation and off-site disposal of vadose-zone soil at Area 8
- Institutional controls and monitoring of groundwater, sediments, and shellfish at Area 8

Response:

OU2's Remedy requires further evaluation as data gaps have been identified an are being investigated.

3. The phytoremediation component of the OU 1 remedy is not operating as anticipated. The Navy has been performing additional investigations, so far resulting in publication of volume 1 of a supplemental RI in support of possible actions to shorten the restoration timeframe and improve the remedy performance. What is your impression of the progress toward reassessing this component of the remedy?

Response:

Progress is being made, investigations take considerable time and resources to complete.

4. To the best of your knowledge, has the on-going program of institutional controls inspections and environmental monitoring at OUs 1 and 2 been sufficiently thorough and frequent to meet the goals of the RODs? Have the monitoring data been timely and of acceptable quality? Please indicate the basis for your assessment.

Response:

Yes, based on receipt of reports and monthly meetings of the Keyport team

5. To the best of your knowledge, have the recommendations made during the fifth FYR been adequately implemented/ incorporated into the remedy operation, maintenance, and monitoring program? Please indicate the basis for your assessment.

Response:

OU1 and OU2 Remedy Performance recommendations have begun but not been completed as the investigations and following studies are ongoing. Monitoring and maintenance recommendations are being adequately addressed.

6. What is your overall impression of meeting the recommendations from the fifth FYR?

Response:

See response to question 5.

7. What do you see as major accomplishments for OUs 1 and 2 since the fifth FYR?

Response:

N/A

8. Are you aware of any Tribal or community concerns regarding implementation of the remedies at OUs 1 and/or 2? If so, please give details.

Response:

Ecology supports the Suquamish Tribe as a Keyport Team member and defers to their response to question 8.

9. Are you aware of, and do you feel well informed about additional investigations that have occurred at OU 1 and OU 2 Areas 2 and 8 over the past five years? Please elaborate.

Response:

Well Informed. Ecology is part of the Keyport team and the Navy team has done a great job of communicating with Ecology.

10. To the best of your knowledge, since June 2019, have there been any new scientific findings that relate to potential site risks that might call into question the protectiveness of the remedies?

Response:

Per- and polyfluoroalkyl substances (PFAS) are moving from a contaminate of emerging concern to being regulated chemical of concern with established cleanup values at the state and federal level.

11. Since June 2019, have there been any complaints, violations, or other incidents related to NBK Keyport installation restoration that required response by your office? If so, please provide details of the event(s) and results of the response(s).

Response:

None that I am aware of, and none since I took over as Site Manager at Ecology.

12. Do you have any other comments, concerns, or suggestions regarding the effectiveness of the cleanup measures implemented so far in protecting human health and the environment at NBK Keyport?

Response:

No comment

Sixth Five-Year Review Interview Record
Naval Base Kitsap Keyport
Keyport, Washington

CONTACT INFORMATION

Name: Shawn Blocker	
Title: Environmental Scientist	**Association to NBK Keyport:** Tribal Trust Responsibility
Organization: Suquamish Tribe	**Years of Association:**
Telephone: [redacted]	**Email:** sblocker@suquamish.nsn.us
Contact Made By:	**Date:** 9/11/2024

QUESTIONNAIRE

1. Please describe your degree of familiarity with the Naval Base Kitsap (NBK) Keyport Records of Decision (RODs) for Operable Units (OUs) 1 and 2; the implementation of the remedies at these OUs; the monitoring and maintenance that has taken place since implementation of the remedies; and recommendations made during the fifth five-year review (FYR) finalized in 2020. For reference OU 1 includes only one active site, whereas OU 2 includes two active sites, as follows:

OU 1 – Former Base Landfill

OU 2 Area 2 – Van Meter Spill and Drum Storage Areas

OU 2 Area 8 – Former Plating Shop

Response:

very familiar.

2. What is your overall impression of the on-going effectiveness of the components of the OU 1 remedy? For reference, the primary remedy components are:

- Phytoremediation at the former landfill using hybrid poplar trees
- Removal of polychlorinated biphenyl (PCB)-contaminated sediments from the marsh
- Upgrade of the tide gate
- Upgrade and maintenance of the landfill cover
- Long-term monitoring
- Contingent actions for off-base domestic wells
- Institutional controls

Response:

It is a failed remedy. The current Navy project team is proactively working to address the issue.

3. What is your overall impression of the on-going effectiveness of the components of the OU 2 remedy? For reference, the primary remedy components are:

- Institutional controls and groundwater monitoring at Area 2
- Excavation and off-site disposal of vadose-zone soil at Area 8
- Institutional controls and monitoring of groundwater, sediments, and shellfish at Area 8

Response:

adequate.

3. The phytoremediation component of the OU 1 remedy is not operating as anticipated. The Navy has been performing additional investigations, so far resulting in publication of volume 1 of a supplemental RI in support of possible actions to shorten the restoration timeframe and improve the remedy performance. What is your impression of the progress toward reassessing this component of the remedy?

Response:

slow but steady.

4. To the best of your knowledge, has the on-going program of institutional controls inspections and environmental monitoring at OUs 1 and 2 been sufficiently thorough and frequent to meet the goals of the RODs? Have the monitoring data been timely and of acceptable quality? Please indicate the basis for your assessment.

Response:

Yes, based on progress reports.

5. To the best of your knowledge, have the recommendations made during the fifth FYR been adequately implemented/ incorporated into the remedy operation, maintenance, and monitoring program? Please indicate the basis for your assessment.

Response:

with the exception of addressing the failed remedy at OU-1, yes.

6. What is your overall impression of meeting the recommendations from the fifth FYR?

Response:

see above.

7. What do you see as major accomplishments for OUs 1 and 2 since the fifth FYR?

Response:

8. Are you aware of any Tribal or community concerns regarding implementation of the remedies at OUs 1 and/or 2? If so, please give details.

Response:

The Tribe is concerned with the pace of addressing the failed remedy at OU-1 as it effects Tribal Treaty rights. Though the current Navy team is proactively trying to address issues, and has implemented improvements and additional site investigations at the site, the pace of government contracting mechanisms is hampering the speed at which work can be done.

9. Are you aware of, and do you feel well informed about additional investigations that have occurred at OU 1 and OU 2 Areas 2 and 8 over the past five years? Please elaborate.

Response:

Very well informed. The current Navy team has done an exceptional job at communicating with the Tribe.

10. To the best of your knowledge, since June 2019, have there been any new scientific findings that relate to potential site risks that might call into question the protectiveness of the remedies?

Response:

PFAS. let's just leave it at that.

11. Since June 2019, have there been any complaints, violations, or other incidents related to NBK Keyport installation restoration that required response by your office? If so, please provide details of the event(s) and results of the response(s).

Response:

Not that I am aware.

12. Do you have any other comments, concerns, or suggestions regarding the effectiveness of the cleanup measures implemented so far in protecting human health and the environment at NBK Keyport?

Response:

As mentioned earlier, the pace of addressing the failed remedy at OU-1 is a major concern to the Tribe.

The Tribe does want to voice their strong support of the current Navy PM, Ms. Amanda Rohrbaugh. Amanda has done an exceptional job trying to move work forward at the Station, as well as communicate in a timely, sincere, and very effective manner with the Tribe.

Appendix C: OU 1 CUMULATIVE LONG-TERM MONITORING DATA

Table C-1. OU 1 Chlorinated VOC Groundwater Sampling Results through April 2023

Location ID	Sampling Date	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	1,1,1-TCA	TCE	Vinyl Chloride
GW Remediation Goals		800	5	0.5	70	100	5	200	5	0.5
North Plantation – Shallow Groundwater Wells										
1MW-1	8/25/1995	14	1 U	**5.1**	**590 J**	**180 J**	1 U	1 U	1 U	**1,000 J**
1MW-1	12/6/1995	1	1 U	1 U[1]	**87 J**	7.7	1 U	1 U	1 U	**210 J**
1MW-1	3/12/1996	8.5	0.5 U	**2.6**	**450 J**	**120 J**	0.5 U	0.5 U	0.62	**710**
1MW-1	6/26/1996	15	0.5 U	**3.2**	**460 J**	**220 J**	0.5 U	0.5 U	0.51 U	**1,200 J**
1MW-1	3/3/1998	4.5	0.5 U	0.42 J	**81 J**	34 J	0.5 U	0.5 U	0.5 U	**250 J**
1MW-1	6/11/1999	19	3 U	**4**	**420**	**240**	3 U	3 U	3 U	**1,300**
1MW-1	10/20/1999	17	0.5 U	**3.1**	**320**	**190**	0.5 U	0.5 U	0.5 U	**970**
1MW-1	4/25/2000	18	0.5 U	**3.1**	**380 J**	**200 J**	0.5 U	0.5 U	0.5 U	**1,200 J**
1MW-1	6/7/2000	14	0.5 U	**1.7**	**240 J**	**210 J**	0.5 U	0.5 U	0.58	**1,200 J**
1MW-1	7/24/2000	25 U	25 U[1]	25 U[1]	**280 J**	**170 J**	25 U[1]	25 U	25 U[1]	**920 J**
1MW-1	10/31/2000	17	1 U	**2**	**270**	**160**	1 U	1 U	1 U	**1,300**
1MW-1	4/27/2001	17	1 UJ	**3.9**	**250 J**	**170 J**	1 U	1 UJ	0.6 J	**770 J**
1MW-1	6/20/2001	19 J	0.58 U	**2.5 J**	**240 J**	**170 J**	0.55 U	0.56 U	0.59 U	**860**
1MW-1	7/30/2001	14 J	1 U	**2.4**	**240 J**	**170**	1 U	1 U	1 U	**1,500 J**
1MW-1	10/29/2001	14 J	1 U	**1.5**	**160 J**	**130**	1 U	1 U	1 U	**970 J**
1MW-1	4/30/2002	16 J	2.5 U	**2.6 J**	**280 J**	**180 J**	2.5 U	2.5 U	2.5 U	**750 J**
1MW-1	6/19/2002	12 J	0.57 U	**1.7 J**	**170 J**	**130 J**	0.55 U	0.57 U	0.59 U	**970 J**
1MW-1	7/23/2002	15 J	2.5 U	**2.6 J**	**280 J**	**200 J**	2.5 U	2.5 U	2.5 U	**1,100 J**
1MW-1	10/24/2002	15 J	2 U	**2 U**[1]	**180 J**	**130 J**	2 U	2 U	2 U	**570 J**
1MW-1	4/29/2003	10 J	0.23 U	**1.4 J**	**160 J**	94 J	0.22 U	0.23 U	0.24 U	**780 J**
1MW-1	10/14/2003	14 J	0.57 U	**1.4 J**	**140 J**	**140 J**	0.55 U	0.57 U	0.59 U	**840 J**
1MW-1	4/22/2004	12	0.12 U	**2 J**	**150 J**	**130 J**	0.11 U	0.12 U	0.31 J	**760 J**
1MW-1	10/13/2004	15	0.12 U	**1.2**	**130 J**	**140 J**	0.11 U	0.12 U	0.23 J	**900 J**
1MW-1	4/14/2005	0.4	0.2 U	0.2 U	0.4	0.6	0.2 U	0.2 U	0.2 U	**4.8**
1MW-1	10/13/2005	13	0.2 U	**0.9**	**100**	91	0.2 U	0.2 U	0.2 U	**830**
1MW-1	7/10/2006	11 DJ	2.5 UJ	**1.1 DJ**	**72 DJ**	**100 DJ**	2.5 UJ	2.5 UJ	2 JD	**820 DJ**
1MW-1	10/16/2006	12	0.5 U	**0.52**	56	92 D	0.5 U	0.5 U	0.14 J	**660 D**
1MW-1	6/13/2007	11	0.5 U	**0.68**	66 D	84 D	0.5 U	0.5 U	0.18 J	**600 D**
1MW-1	10/18/2007	13	0.5 U	**0.63**	69	86 D	0.5 U	0.5 U	0.15 J	**540 D**
1MW-1	5/13/2008	10 D	1 U	0.46 D	33 D	67 D	1 U	1 U	0.16 JD	**580 D**
1MW-1	10/28/2008	10 D	1 U	0.46 JD	39 D	71 D	1 U	1 U	1 U	**490 D**
1MW-1	6/18/2009	9.6 D	1 U	0.46 D	43 D	73 D	1 U	1 U	1 U	**570 D**
1MW-1	10/27/2009	8.3 D	1 U	0.2 JD	14 D	46 D	1 U	1 U	1 U	**420 D**
1MW-1	6/15/2010	9.2	0.5 U	0.45 J	39 D	60 D	0.5 U	0.5 U	0.17 J	**380 D**
1MW-1	10/25/2010	8.4 D	1.3 U	0.4 JD	31 D	31 D	1.3 U	1.3 U	1.3 U	**400 D**
1MW-1	7/18/2011	9.1	0.5 U	0.39 J	37	67	0.5 U	0.5 U	0.14 J	**370 D**
1MW-1	10/25/2011	8.1	0.5 U	0.27	31	60	0.5 U	0.5 U	0.5 U	**280 D**
1MW-1	6/12/2012	8.4	0.5 U	0.26 J	24	49	0.5 U	0.5 U	0.11 J	**290 D**
1MW-1	6/23/2014	6.1	0.5 U	0.19 J	17	35	0.5 UJ	0.5 U	0.5 U	**280 D**
1MW-1	6/21/2016	4.6	0.08 J	0.5 U	13	25	0.5 U	0.5 U	0.5 U	**230 D**
1MW-1	6/11/2019	3.2	0.2 UM	0.12 JM	9.9	23	0.5 U	0.2 U	0.2 U	**230 D**
MW1-02	8/28/1995	1 U	1 U	**4.2**	**1,400 J**	23	1 U	1 U	**36 J**	**150 J**
MW1-02	12/6/1995	1 U	1 U	**3.5**	**1,300 J**	22	1 U	1 U	**35 J**	**140 J**
MW1-02	3/11/1996	0.5 U	0.5 U	**4.8**	**1,800 J**	30 J	0.5 U	0.5 U	**41**	**200 J**
MW1-02	6/25/1996	0.23 J	0.5 U	**5.1 J**	**1,500 J**	31 J	0.5 U	0.5 U	**43 J**	**180 J**
MW1-02	3/2/1998	0.5 U	0.5 U	**3.4**	**1,200 J**	21	0.5 U	0.5 U	**29 J**	**110 J**
MW1-02	6/11/1999	3 U	3 U	**5**	**1,200**	26	3 U	3 U	**27**	**160**
MW1-02	10/20/1999	0.5 U	0.5 U	**3.4**	**1,000**	21	0.5 U	0.5 U	**23**	**110**

Table C-1. OU 1 Chlorinated VOC Groundwater Sampling Results through April 2023

Location ID	Sampling Date	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	1,1,1-TCA	TCE	Vinyl Chloride
GW Remediation Goals		800	5	0.5	70	100	5	200	5	0.5
MW1-02	4/25/2000	0.5 U	0.5 U	**6**	**1,900 J**	49 J	0.5 U	0.5 U	**13**	**220 J**
MW1-02	6/8/2000	0.3 J	0.2 J	**3.2 J**	**890 J**	21 J	0.5 U	0.5 U	**22 J**	**110 J**
MW1-02	7/24/2000	25 U	25 U[1]	25 U[1]	**750 J**	25 U	25 U[1]	25 U	25 U[1]	**87 J**
MW1-02	10/31/2000	1 U	1 U	**2.2**	**810**	15	1 U	1 U	**12**	**85**
MW1-02	4/26/2001	1 U	1 UJ	**6.3**	**1,200 J**	44	1 U	1 UJ	**21**	**120 J**
MW1-02	6/20/2001	0.91 U	1.2 U	**3.6 J**	**950 J**	18 J	1.1 U	1.2 U	**19 J**	**89 J**
MW1-02	7/30/2001	1 U	1 U	**2.1**	**660 J**	43 J	1 U	1 U	**19**	**130 J**
MW1-02	10/29/2001	1 U	1 U	**2.4**	**700 J**	18	1 U	1 U	**14**	**93**
MW1-02	4/30/2002	2.5 U	2.5 U	**3.6 J**	**1,200 J**	29 J	2.5 U	2.5 U	**5 J**	**140 J**
MW1-02	6/19/2002	0.26 J	0.23 U	**2.2 J**	**660 J**	13 J	0.22 U	0.23 U	**15 J**	**75 J**
MW1-02	7/23/2002	1 U	1 U	**2.6 J**	**720 J**	16 J	1 U	1 U	**17 J**	**100 J**
MW1-02	10/24/2002	2.5 U	2.5 U	**2.7 J**	**910 J**	17 J	2.5 U	2.5 U	**21 J**	**120 J**
MW1-02	4/30/2003	0.37 U	0.46 U	**3.4 J**	**870 J**	18 J	0.44 U	0.46 U	**13 J**	**130 J**
MW1-02	10/15/2003	0.26 J	0.12 U	**2.6**	**710 J**	15	0.11 U	0.12 U	**19**	**120 J**
MW1-02	4/22/2004	0.37 J	0.12 U	**3.9**	**1,200 J**	22	0.11 U	0.12 U	**14**	**200 J**
MW1-02	10/13/2004	0.45 J	0.12 U	**3.6**	**930 J**	23	0.11 U	0.12 U	**6.6**	**160 J**
MW1-02	4/12/2005	0.3	0.2 U	**2.2**	**690**	15	0.2 U	0.2 U	**13**	**180**
MW1-02	10/12/2005	0.4	0.2 U	**2.9**	**810**	20	0.2 U	0.2 U	4.1	**140**
MW1-02	7/10/2006	2.5 U	2.5 U	**2.8 D**	**660 D**	17 D	2.5 U	2.5 U	2 JD	**150 D**
MW1-02	10/16/2006	0.33 J	0.5 U	**2**	**560 D**	16	0.5 U	0.5 U	1.3	**110 D**
MW1-02	6/13/2007	0.36 JD	1 U	**2.1 D**	**680 D**	16 D	1 U	1 U	**5.2 D**	**140 D**
MW1-02	10/18/2007	0.28 JD	1 U	**1.9 D**	**590 D**	15 D	1 U	1 U	**9.5 D**	**98 D**
MW1-02	5/8/2008	0.28 J	0.5 U	**1.8**	**460 D**	13	0.5 U	0.5 U	**7.5**	**110 D**
MW1-02	10/28/2008	0.25 JD	1.3 U	**1.8 D**	**420 D**	11 D	1.3 U	1.3 U	**9.1 D**	**88 D**
MW1-02	6/19/2009	0.22 JD	1 U	**1.5 D**	**460 D**	11 D	1 U	1 U	**6.4 D**	**87 D**
MW1-02	10/27/2009	0.26 JD	1 U	**1.8 D**	**440 D**	11 D	1 U	1 U	**6.2 D**	**91 D**
MW1-02	6/15/2010	0.27 J	0.5 U	**1.9**	**490 D**	13	0.5 U	0.5 U	**7.5**	**92 D**
MW1-02	10/25/2010	0.24 JD	1 U	**1.4 D**	**410 D**	10 D	1 U	1 U	**5.8 D**	**96 D**
MW1-02	7/19/2011	0.37 J	0.5 U	**1.7**	**440 D**	14	0.5 U	0.5 U	3	**90 D**
MW1-02	10/25/2011	0.28 J	0.5 U	**1.1**	**360 D**	9.9	0.5 U	0.5 U	2.3	**67**
MW1-02	6/12/2012	0.35 J	0.5 U	**1.8**	**450 D**	14	0.5 U	0.5 U	**5.8**	**81 D**
MW1-02	6/23/2014	0.34 J	0.5 U	**1.5**	**390 D**	13	0.5 UJ	0.5 U	4.7	**110 D**
MW1-02	6/21/2016	0.41 J	0.5 U	**1.2**	**330 D**	11	0.5 U	0.5 U	1.2	**89 D**
MW1-02	6/19/2017	0.31 J	0.5 U	**0.65**	**200 D**	6.6	0.5 U	0.5 U	2.1	**54**
MW1-02	6/18/2019	0.37	0.2 U	**0.63**	**160 D**	7	0.5 U	0.2 U	1.1	**79 DM**
MW1-03	3/8/1996	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-03	6/21/1996	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-03	9/11/1996	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-03	10/20/1999	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.7	0.5 U
MW1-03	4/25/2000	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-03	7/24/2000	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-03	10/31/2000	1 U	1 U	1 U[1]	1 U	1 U	1 U	1 U	1 U	1 U[1]
MW1-03	4/27/2001	1 U	1 UJ	1 U[1]	1 U	1 U	1 U	1 UJ	1 U	1 U[1]
MW1-03	7/30/2001	1 U	1 U	1 U[1]	1 U	1 U	1 U	1 U	1 U	1 U[1]
MW1-03	10/29/2001	1 U	1 U	1 U[1]	1	1.1	1 U	1 U	1 U	**3.3**
MW1-03	4/30/2002	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-03	7/23/2002	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-03	10/24/2002	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-03	4/29/2003	0.091 U	0.12 U	0.12 U	0.12 U	0.14 U	0.11 U	0.12 U	0.12 U	0.22 U

Table C-1. OU 1 Chlorinated VOC Groundwater Sampling Results through April 2023

Location ID	Sampling Date	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	1,1,1-TCA	TCE	Vinyl Chloride
GW Remediation Goals		800	5	0.5	70	100	5	200	5	0.5
MW1-03	10/14/2003	0.091 U	0.12 U	0.12 U	0.12 U	0.14 U	0.11 U	0.12 U	0.12 U	0.22 U
MW1-03	4/21/2004	0.091 U	0.12 U	0.12 U	0.12 U	0.14 U	0.11 U	0.12 U	0.12 U	0.22 U
MW1-03	10/13/2004	0.091 U	0.12 U	0.12 U	0.12 U	0.15 U	0.11 U	0.12 U	0.12 U	0.23 J
MW1-03	4/12/2005	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
MW1-03	10/12/2005	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
MW1-03	7/12/2006	0.5 U	0.5 U	0.2 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 U
MW1-03	10/16/2006	0.5 U	0.5 U	0.3 U	0.17 J	0.5 U	0.5 U	0.5 U	0.5 U	0.09 J
MW1-03	6/13/2007	0.5 U	0.5 U	0.2 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 U
MW1-03	10/19/2007	0.5 U	0.5 U	0.2 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 U
MW1-03	5/7/2008	0.5 U	0.5 U	0.2 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 U
MW1-03	10/28/2008	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 U
MW1-03	6/19/2009	0.5 U	0.5 U	0.2 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 U
MW1-03	10/27/2009	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-03	6/15/2010	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-03	10/25/2010	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-03	7/19/2011	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-03	10/25/2011	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-03	6/12/2012	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-03	6/23/2014	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
MW1-03	6/22/2016	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-41	10/21/1999	0.5 U	0.5 U	0.5 U	0.6	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-41	4/26/2000	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-41	6/8/2000	0.2 J	0.5 U	0.5 U	0.82	0.5 U	0.5 U	0.5 U	0.5 U	**0.53**
MW1-41	7/24/2000	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-41	11/2/2000	1 U	1 U	1 U[1]	1 U	1 U	1 U	1 U	1 U	1 U[1]
MW1-41	4/26/2001	1 U	1 UJ	1 U[1]	1 U	1 U	1 U	1 UJ	1 U	1 U[1]
MW1-41	6/20/2001	0.1 J	0.12 U	0.12 U	0.4 J	0.14 U	0.11 U	0.12 U	0.12 U	0.4 J
MW1-41	6/20/2001	0.091 U	0.12 U	0.12 U	0.41 J	0.14 U	0.11 U	0.12 U	0.12 U	0.42 J
MW1-41	7/30/2001	1 U	1 U	1 U[1]	1 U	1 U	1 U	1 U	1 U	**0.6 J**
MW1-41	10/29/2001	1 U	1 U	1 U[1]	1 U	1 U	1 U	1 U	1 U	**0.5 J**
MW1-41	4/30/2002	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-41	6/19/2002	0.091 U	0.12 U	0.12 U	0.41 J	0.14 U	0.11 U	0.12 U	0.12 U	0.43 J
MW1-41	7/23/2002	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-41	10/24/2002	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-41	4/30/2003	0.091 U	0.12 U	0.12 U	0.43 U	0.14 U	0.11 U	0.12 U	0.12 U	0.43 U
MW1-41	10/15/2003	0.091 U	0.12 U	0.12 U	0.37 J	0.14 U	0.11 U	0.12 U	0.12 U	0.28 J
MW1-41	4/22/2004	0.091 U	0.12 U	0.12 U	0.3 J	0.14 U	0.11 U	0.12 U	0.12 U	0.3 J
MW1-41	10/13/2004	0.1 J	0.12 U	0.12 U	0.41 J	0.15 U	0.11 U	0.12 U	0.12 U	0.35 J
MW1-41	4/12/2005	0.2 U	0.2 U	0.2 U	0.3	0.2 U	0.2 U	0.2 U	0.2 U	0.3
MW1-41	10/12/2005	0.2 U	0.2 U	0.2 U	0.5	0.2 U	0.2 U	0.2 U	0.2 U	0.3
MW1-41	7/10/2006	0.5 U	0.5 U	0.2 U	0.26 J	0.5 U	0.5 U	0.5 U	0.5 U	0.23
MW1-41	10/16/2006	0.5 U	0.5 U	0.3 U	0.34 J	0.5 U	0.5 U	0.5 U	0.5 U	0.22
MW1-41	6/13/2007	0.5 U	0.5 U	0.2 U	0.25 J	0.5 U	0.5 U	0.5 U	0.5 U	0.21
MW1-41	10/18/2007	0.5 U	0.5 U	0.2 U	0.31 J	0.5 U	0.5 U	0.5 U	0.5 U	0.18 J
MW1-41	5/8/2008	0.5 U	0.5 U	0.2 U	0.27 J	0.11 J	0.5 U	0.5 U	0.5 U	0.19 J
MW1-41	10/28/2008	0.08 J	0.5 U	0.5 U	0.32 J	0.12 J	0.5 U	0.5 U	0.5 U	0.16 J
MW1-41	6/19/2009	0.5 U	0.5 U	0.2 U	0.26 J	0.07 J	0.5 U	0.5 U	0.5 U	0.2
MW1-41	10/27/2009	0.5 U	0.5 U	0.5 U	0.28 J	0.1 J	0.5 U	0.5 U	0.5 U	0.17 J
MW1-41	6/15/2010	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 J

Table C-1. OU 1 Chlorinated VOC Groundwater Sampling Results through April 2023

Location ID	Sampling Date	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	1,1,1-TCA	TCE	Vinyl Chloride
GW Remediation Goals		800	5	0.5	70	100	5	200	5	0.5
MW1-41	10/25/2010	0.5 U	0.5 U	0.5 U	0.29 J	0.5 U	0.5 U	0.5 U	0.5 U	0.18 J
MW1-41	7/18/2011	0.5 U	0.5 U	0.5 U	0.26 J	0.08 J	0.5 U	0.5 U	0.5 U	0.16 J
MW1-41	10/25/2011	0.5 U	0.5 U	0.5 U	0.23 J	0.09 J	0.5 U	0.5 U	0.5 U	0.12 J
MW1-41	6/19/2019	0.04 J	0.2 U	0.2 U	0.16 J	0.2 U	0.2 U	0.2 U	0.2 U	0.12
South Plantation – Shallow Groundwater Wells										
MW1-04	8/23/1995	1 U	1 U	**7.7**	**6,400 J**	80 J	2.2	1 U	**11,000 J**	**2,000 J**
MW1-04	12/5/1995	1 U	1 U	**5.2**	**3,900 J**	500 U[1]	1.7	1 U	**8,600 J**	**2,800 J**
MW1-04	3/5/1996	0.67 J	0.5 UJ	**5.6 J**	**3,500 J**	56 J	0.96 J	0.5 UJ	**6,300 J**	**1,100 J**
MW1-04	6/20/1996	0.64	0.5 U	**13**	**5,900 J**	41	4	0.5 U	**22,000 J**	**970 J**
MW1-04	3/3/1998	0.5 U	0.5 U	**16**	**13,000 J**	**140 J**	3.8	0.5 U	**22,000 J**	**1,900 J**
MW1-04	6/14/1999	2 J	3 U	**24**	**12,000 J**	**140**	4	3 U	**26,000**	**1,800**
MW1-04	10/21/1999	0.8	0.5 U	**10**	**5,300**	70	0.7	0.5 U	**3,600**	**1,100**
MW1-04	4/26/2000	1.4	0.5 U	**16**	**8,500 J**	**100 J**	2.9	0.5 U	**19,000 J**	**1,300 J**
MW1-04	6/7/2000	0.3 J	0.5 U	**6.2**	**15,000 J**	**100 J**	1.3	0.5 U	**38,000**	**1,300**
MW1-04	7/25/2000	250 U	250 U[1]	250 U[1]	**8,500 J**	250 U[1]	250 U[1]	250 U[1]	**18,000 J**	**860 J**
MW1-04	11/9/2000	1 U	1 U	**0.9 J**	**660**	12	1 U	1 U	**490**	**190**
MW1-04	4/27/2001	1 U	1 UJ	**6.6**	**3,700 J**	74 J	0.8 J	1 UJ	**3,900 J**	**700 J**
MW1-04	6/20/2001	4.6 U	5.7 U[1]	**18 J**	**12,000 J**	**110 J**	5.5 U[1]	5.6 U	**13,000 J**	**1,700 J**
MW1-04	7/31/2001	1 U	1 U	**2.9**	**2,200 J**	95 J	0.6 J	1 U	**2,700 J**	**400 J**
MW1-04	10/30/2001	1 U	1 U	**0.5 J**	**270 J**	3	1 U	1 U	**170**	**49**
MW1-04	5/1/2002	2.5 U	2.5 U	2.5 U[1]	**600 J**	3.7 J	2.5 U	2.5 U	**730 J**	**54 J**
MW1-04	6/17/2002	9.1 U	12 U[1]	**30 J**	**15,000 J**	**100 J**	11 U[1]	12 U	**42,000 J**	**970 J**
MW1-04	7/25/2002	1 U	1 U	**1.1 J**	**600 J**	2.7 J	1 U	1 U	**580 J**	**95 J**
MW1-04	10/25/2002	0.5 U	0.5 U	**0.8**	**430 J**	3.9	0.5 U	0.5 U	**490 J**	**36 J**
MW1-04	4/29/2003	4.6 U	5.7 U[1]	16 U[1]	**7,000 J**	53 J	5.5 U[1]	5.7 U	**11,000 J**	**1,100 J**
MW1-04	10/15/2003	2.3 U	2.9 U	**9 J**	**4,000 J**	50 J	2.8 U	2.9 U	**2,500 J**	**1,800 J**
MW1-04	4/21/2004	9.1 U	12 U[1]	**18 J**	**8,100 J**	71 J	11 U[1]	12 U	**20,000 J**	**460 J**
MW1-04	10/14/2004	1.2	0.12 U	**28**	**15,000 J**	94 J	3.8	0.12 U	**22,000 J**	**770 J**
MW1-04	4/13/2005	0.2 U	0.2 U	200 U[1]	**10,000**	200 U[1]	2.3	0.2 U	**16,000**	**800**
MW1-04	10/13/2005	0.2 U	0.2 U	**13**	**8,600**	100 U[1]	1.5	0.2 U	**7,800**	**1,900**
MW1-04	7/12/2006	50 U	50 U[1]	**16 JD**	**6,300 D**	53 D	50 U[1]	50 U	**14,000 D**	**540 D**
MW1-04	10/17/2006	0.23 J	0.5 U	**17**	**11,000 D**	77 D	0.63	0.5 U	**3000 D**	**4500 D**
MW1-04	6/14/2007	100 U	100 U[1]	100 U[1]	**11,000 D**	72 JD	100 U[1]	100 U	**24,000 D**	**850 D**
MW1-04	10/17/2007	10 U	10 U[1]	**5 D**	**3,400 D**	23 D	10 U[1]	10 U	**3,100 D**	**240 D**
MW1-04	5/7/2008	50 U	50 U[1]	**18 JD**	**7,500 D**	73 D	50 U[1]	50 U	**24,000 D**	**410 D**
MW1-04	10/28/2008	13 U	13 U[1]	**4.5 JD**	**3,400 D**	23 D	13 U[1]	13 U	**6,600 D**	**180 D**
MW1-04	6/25/2009	50 U	50 U[1]	**23 D**	**12,000 D**	93 D	50 U[1]	50 U	**30,000 JD**	**510 D**
MW1-04	10/27/2009	5 U	5 U	**3.4 JD**	**1,600 D**	10 D	5 U	5 U	**2,000 D**	**100 D**
MW1-04	6/16/2010	50 U	50 U[1]	**25 JD**	**17,000 D**	**170 D**	50 U[1]	50 U	**32,000 D**	**960 D**
MW1-04	10/25/2010	10 U	10 U[1]	**4.2 JD**	**2,700 D**	21 D	10 U[1]	10 U	**5,400 D**	**130 D**
MW1-04	7/18/2011	50 U[1/]	0.5 U	**17 JD**	**1,100 D**	95 D	50 U1/	50 U	**22,000 D**	**440 D**
MW1-04	10/25/2011	2.5 U	2.5 U	**1.6 JD**	**840 D**	6.3 D	2.5 U	2.5 U	**380 D**	**56 D**
MW1-04	6/12/2012	25 U	25 U[1]	**7 JD**	**7,000 D**	46 D	25 U[1]	25 U	**16,000 D**	**130 D**
MW1-04	6/17/2013	25 U	25 U[1]	**8.5 JD**	**7,700 D**	46 D	25 U[1]	25 U	**15,000 D**	**130 D**
MW1-04	6/17/2014	10 U	10 U[1]	**4.2 JD**	**3,500 D**	27 D	10 U[1]	10 U	**6,100 D**	**110 D**
MW1-04	6/24/2015	2.5 U	2.5 U	**2.9 D**	**1,800 D**	16 D	2.5 U	2.5 U	**1,600 D**	**96 D**
MW1-04	6/23/2016	2.5 U	2.5 U	**2.9 D**	**1,800 D**	14 D	2.5 U	2.5 U	**1,700 D**	**85 D**
MW1-04	6/19/2017	10 U	10 U[1]	**6.6 J D**	**5600 D**	56 D	10 U[1]	10 U	**11000 D**	**240 D**

Table C-1. OU 1 Chlorinated VOC Groundwater Sampling Results through April 2023

Location ID	Sampling Date	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	1,1,1-TCA	TCE	Vinyl Chloride
GW Remediation Goals		800	5	0.5	70	100	5	200	5	0.5
MW1-04	6/19/2019	0.2 U	0.2 U	**1.3**	**580 D**	7.3	0.5 U	0.2 U	**680 D**	**34**
MW1-04[a]	8/22/2022	7 U	15 U[1]	7 U[1]	**140**	7 U	25 U[1]	7 U	**520**	**6.6 J**
MW1-04[a]	10/25/2022	5 U	8 U[1]	5 U[1]	**250**	8 U	8 U[1]	8 U	**270**	**8.6 J**
MW1-04[a]	1/23/2023	5 U	8 U[1]	5 U[1]	**320**	4.3 J	8 U[1]	8 U	**290**	**5.2 J**
MW1-05	8/23/1995	5.8 J	1 U	1 U[1]	17	1.3	1 U	1 U	1.9	**140 J**
MW1-05	12/5/1995	110 J	1 U	1 U[1]	**74 J**	16	1 U	1 U	**7.3**	**4,300 J**
MW1-05	3/6/1996	34	0.5 U	0.5 U	60	7	0.5 U	0.5 U	3	**1,100**
MW1-05	6/20/1996	29 J	0.5 U	0.24 J	**93 J**	6.5	0.5 U	0.5 U	1.7	**1,500 J**
MW1-05	3/4/1998	67 J	0.26 J	0.5 U	8.9	7.2	0.5 U	0.5 U	1.6	**1,000 J**
MW1-05	6/14/1999	9	3 U	3 U[1]	9	2 J	3 U	3 U	2 J	**290**
MW1-05	10/21/1999	9.6	0.5 U	0.5 U	0.5	0.5	0.5 U	0.5 U	0.5 U	**18**
MW1-05	4/25/2000	1.1	0.5 U	0.5 U	1.2	0.5 U	0.5 U	0.5 U	0.5 U	**30**
MW1-05	6/7/2000	6.9	0.5 U	0.5 U	1.8	0.64	0.5 U	0.5 U	1.6	**22**
MW1-05	7/25/2000	1.8	0.5 U	0.5 U	3.4	0.5 U	0.5 U	0.5 U	0.5 U	**31**
MW1-05	11/6/2000	1.7	1 U	1 U[1]	1 U	1 U	1 U	1 U	1 U	**7**
MW1-05	4/26/2001	1 U	1 UJ	1 U[1]	1 U	1 U	1 U	1 UJ	1 U	**24**
MW1-05	6/20/2001	1.5	0.12 U	0.12 U	0.46 J	0.28 J	0.11 U	0.12 U	0.46 J	**32**
MW1-05	7/31/2001	0.5 J	1 U	1 U[1]	1 U	1 U	1 U	1 U	1 U	**13**
MW1-05	10/30/2001	1.7	1 U	1 U[1]	0.5 J	1 U	1 U	1 U	1 U	**3.5**
MW1-05	5/1/2002	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**1.7**
MW1-05	6/17/2002	0.93	0.12 U	0.12 U	0.74	0.16 J	0.11 U	0.12 U	0.85	**11**
MW1-05	7/24/2002	0.65	0.5 U	0.5 U	0.63 J	0.5 U	0.5 U	0.5 U	0.66	**2.5**
MW1-05	10/25/2002	15	0.5 U	0.5 U	0.82	0.5 U	0.5 U	0.5 U	0.8	**5.6**
MW1-05	4/29/2003	0.32 U	0.12 U	0.12 U	0.3 U	0.14 U	0.11 U	0.12 U	0.33 U	**5.6**
MW1-05	10/15/2003	2	0.12 U	0.12 U	0.41 J	0.22 J	0.11 U	0.12 U	0.24 J	**3.1**
MW1-05	4/22/2004	0.24 J	0.12 U	0.12 U	0.27 J	0.14 U	0.11 U	0.12 U	0.24 J	**0.83**
MW1-05	10/14/2004	1.4	0.12 U	0.12 U	0.56	0.31 J	0.11 U	0.12 U	0.55	**2**
MW1-05	4/13/2005	0.2 U	0.2 U	0.2 U	2	0.2 U	0.2 U	0.2 U	**10**	**0.9**
MW1-05	10/12/2005	3	0.2 U	0.2 U	0.7	0.2 U	0.2 U	0.2 U	0.5	**5.9**
MW1-05	7/12/2006	0.48 J	0.5 U	0.2 U	0.4 J	0.5 U	0.5 U	0.5 U	0.5 U	**0.91**
MW1-05	10/16/2006	6.8	0.5 U	0.3 U	0.9	0.4 J	0.5 U	0.5 U	0.65	**11**
MW1-05	6/14/2007	0.44 J	0.5 U	0.5 U	0.27 J	0.5 U	0.5 U	0.5 U	0.27 J	**0.7**
MW1-05	10/17/2007	2.1	0.5 U	0.2 U	0.55	0.17 J	0.5 U	0.5 U	0.34 J	**4**
MW1-05	5/12/2008	0.16 J	0.5 U	0.2 U	0.26 J	0.1 J	0.5 U	0.5 U	0.27 J	0.42
MW1-05	10/29/2008	1.4	0.5 U	0.5 U	0.54	0.24 J	0.5 U	0.5 U	0.39 J	**2.2**
MW1-05	6/26/2009	3.4	0.5 U	0.2 U	0.51	0.59	0.5 U	0.5 U	0.47 J	**6.6**
MW1-05	10/27/2009	0.97	0.5 U	0.5 U	0.44 J	0.23 J	0.5 U	0.5 U	0.44 J	**1.9**
MW1-05	6/16/2010	2.6	0.5 U	0.5 U	0.62	0.55	0.5 U	0.5 U	0.52	**8.1**
MW1-05	10/25/2010	0.37 J	0.5 U	0.5 U	0.35 J	0.5 U	0.5 U	0.5 U	0.32 J	**0.74**
MW1-05	7/18/2011	1.9	0.5 U	0.5 U	0.6	0.47 J	0.5 U	0.5 U	0.42 J	**9.4**
MW1-05	10/26/2011	1.4	0.5 U	0.5 U	0.46 J	0.16 J	0.5 U	0.5 U	0.4 J	**3.6**
MW1-05	6/12/2012	0.25 J	0.5 U	0.5 UJ	0.24 J	0.1 J	0.5 U	0.5 U	0.27 J	**2.2**
MW1-05	6/17/2013	0.1 J	0.5 U	0.5 U	0.19 J	0.5 U	0.5 U	0.5 U	0.16 J	0.31 J
MW1-05	6/17/2014	0.78	0.5 U	0.5 U	0.85	0.2 J	0.5 U	0.5 U	0.24 J	**17**
MW1-05	6/24/2015	0.6	0.5 U	0.5 U	0.53	0.08 J	0.5 U	0.5 U	0.29 J	**7.7 J**
MW1-05	6/22/2016	4	0.5 U	0.11 J	5.5	1.2	0.5 U	0.5 U	0.46 J	**64**
MW1-05	6/19/2017	2.7	0.5 U	0.09 J	5.7	1.1	0.5 U	0.5 U	0.58	**53**
MW1-16	8/31/1995	**12,000 J**	**15 J**	**680 J**	**14,000 J**	**520 J**	0.51 J	**5,600 J**	**250 J**	**12,000 J**
MW1-16	6/20/1996	**30,000 J**	**35 J**	**180 J**	**3,100 J**	**180 J**	1.3 J	**430 J**	**34 J**	**2,200 J**

Table C-1. OU 1 Chlorinated VOC Groundwater Sampling Results through April 2023

Location ID	Sampling Date	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	1,1,1-TCA	TCE	Vinyl Chloride
GW Remediation Goals		800	5	0.5	70	100	5	200	5	0.5
MW1-16	3/4/1998	**24,000 J**	**24 J**	**110 J**	**18,000 J**	**180 J**	1.5	**840 J**	**4,000 J**	**3,900 J**
MW1-16	6/14/1999	**15,000 J**	**17**	**48**	**6,900**	**160**	1 J	140	**550**	**4,100**
MW1-16	10/21/1999	**6,500**	**9**	**5**	28	26	1.2	23	**9.2**	**28**
MW1-16	4/26/2000	**1,700 J**	0.5 UJ	0.5 UJ	**70 J**	7.4 J	0.69 J	16 J	3.3 J	**4.3 J**
MW1-16	6/7/2000	**2,500**	2.7	**2 J**	13	13	1 J	29	**20**	**6.6**
MW1-16	7/25/2000	**2,300 J**	50 U[1]	50 U[1]	50 U	50 U	50 U[1]	50 U	50 U[1]	50 U[1]
MW1-16	11/6/2000	**3,900**	4.2	**1.3**	12	16	1 U	21 J	4.1	1 U[1]
MW1-16	4/27/2001	**1,100 J**	1.6 J	1 U[1]	2.4	7.5	0.4 J	7.2 J	2.2	**19**
MW1-16	6/20/2001	**2,900 J**	**7 J**	**23 J**	**9,300 J**	98 J	5.5 U[1]	28 J	**370 J**	**1,400 J**
MW1-16	7/31/2001	**1,900 J**	1.9	**2.2**	60	12	1 U	15	**8.3**	**68 J**
MW1-16	10/30/2001	**3,400 J**	4.1	**2.1**	13	17	1 U	13	3.5	**11**
MW1-16	5/1/2002	**1,200 J**	2.5 U	2.5 U[1]	3.9 J	7.9 J	2.5 U	5.6 J	2.5 U	**2.7 J**
MW1-16	6/17/2002	**10,000 J**	12 U[1]	**42 J**	**24,000 J**	**240 J**	11 U[1]	38 J	**150 J**	**3,000 J**
MW1-16	7/24/2002	**3,200 J**	5 U	5 U[1]	**340 J**	17 J	5 U	10 J	**5.5 J**	**86 J**
MW1-16	10/25/2002	**9,000 J**	25 U[1]	25 U[1]	**190 J**	38 J	25 U[1]	25 U	25 U[1]	**80 J**
MW1-16	4/29/2003	330 J	0.41 U	0.37 U	1.6	3.9	0.31 U	0.52	1.3	**2.1**
MW1-16	10/15/2003	**1,700 J**	1.2 U	1.2 U[1]	6.2 J	13 J	1.1 U	5.3 J	2.4 J	**5.5 J**
MW1-16	4/21/2004	160 J	0.21 J	0.24 J	1.8	3	0.13 J	0.2 J	1	**1.7**
MW1-16	10/13/2004	**4,200 J**	3.7	**1.1**	11	23	0.42 J	10	4.5	**9.3**
MW1-16	4/13/2005	88	0.2 U	0.2 U	1.2	2.8	0.2 U	0.2 U	0.6	**0.6**
MW1-16	10/13/2005	220	0.2 J	0.2 J	13 J	7 J	0.2 U	0.2 U	2 J	**5.9 J**
MW1-16	7/14/2006	240 D	1 U	0.4 D	3.3 D	3.2 D	1 U	1 U	1.2 D	**2.8 D**
MW1-16	10/17/2006	**1,000 D**	0.47 J	**0.63**	**440 D**	26	0.13 J	0.23 J	2.6	**290 D**
MW1-16	6/14/2007	40	0.5 U	0.13 J	1.6	2.2	0.5 U	0.5 U	0.7	**0.89**
MW1-16	10/17/2007	98 D	2.5 U	1 U	6.5 D	6.1 D	2.5 U	2.5 U	1.8 JD	**2.5 D**
MW1-16	5/12/2008	17	0.5 U	0.14 J	1.1	1.9	0.5 U	0.5 U	0.65	**0.68**
MW1-16	10/29/2008	68 D	0.14 JD	0.2 JD	12 D	6.7 D	1 U	1 U	1 D	**6.3 D**
MW1-16	6/25/2009	37	0.5 U	0.23	29	2.6	0.5 U	0.08 J	3.1	**11**
MW1-16	10/27/2009	68 D	1 U	0.4 JD	35 D	4.2 D	1 U	1 U	3.2 D	**13 D**
MW1-16	6/16/2010	92 D	0.5 U	0.5 U	0.95	2.8	0.5 U	0.2 J	0.57	0.47 J
MW1-16	10/25/2010	52	0.5 U	0.08 J	8.1	2.2	0.5 U	0.5 U	0.43 J	**4**
MW1-16	7/18/2011	5.3	0.5 U	0.1 J	1.6	1.1	0.5 U	0.5 U	0.39 J	**0.72**
MW1-16	10/25/2011	**1,500** D	1.3 JD	**1.2** JD	**1,300** D	34 D	2.5 U	0.85 JD	1.4 JD	**360** D
MW1-16	6/12/2012	28	0.5 U	0.5 UJ	1.3	0.65	0.5 U	0.5 U	0.21 J	0.26 J
MW1-16	6/17/2013	15	0.5 U	0.15 J	14	1.8	O.5 U	0.5 U	0.32 J	**4.8**
MW1-16	6/17/2014	2.5	0.5 U	0.5 U	0.63	0.39 J	0.5 UJ	0.5 U	0.11 J	0.29 J
MW1-16	6/24/2015	5.2	0.5 U	0.5 U	1.1	0.93	0.5 U	0.5 U	0.31 J	**0.54 J**
MW1-16	6/22/2016	4.4	0.5 U	0.5 U	2	1.3	0.5 U	0.5 U	0.16 J	**1.5**
MW1-16	6/19/2017	2	0.5 U	0.5 U	0.69	0.41 J	0.5 U	0.5 U	0.5 U	**0.54**
MW1-20	8/30/1995	1 U	1 U	1 U[1]	1 U	1 U	1 U	1 U	1 U	1 U[1]
MW1-20	12/8/1995	1 U	1 U	1 U[1]	1 U	1 U	1 U	1 U	1 U	1 U[1]
MW1-20	3/11/1996	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-20	6/27/1996	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-20	10/21/1999	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-20	4/26/2000	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-20	7/25/2000	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-20	10/31/2000	1 U	1 U	1 U[1]	1 U	1 U	1 U	1 U	1 U	1 U[1]
MW1-20	7/31/2001	1 U	1 U	1 U[1]	1 U	1 U	1 U	1 U	1 U	1 U[1]

Table C-1. OU 1 Chlorinated VOC Groundwater Sampling Results through April 2023

Location ID	Sampling Date	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	1,1,1-TCA	TCE	Vinyl Chloride
GW Remediation Goals		800	5	0.5	70	100	5	200	5	0.5
MW1-20	10/30/2001	1 U	1 U	1 U[1]	1 U	1 U	1 U	1 U	1 U	1 U[1]
MW1-20	5/1/2002	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-20	7/25/2002	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-20	10/25/2002	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-20	4/29/2003	0.091 U	0.12 U	0.12 U	0.12 U	0.14 U	0.11 U	0.12 U	0.12 U	0.22 U
MW1-20	10/14/2003	0.091 U	0.12 U	0.12 U	0.12 U	0.14 U	0.11 U	0.12 U	0.12 U	0.22 U
MW1-20	4/21/2004	0.091 U	0.12 U	0.12 U	0.12 U	0.14 U	0.11 U	0.12 U	0.12 U	0.22 U
MW1-20	10/13/2004	0.091 U	0.12 U	0.12 U	0.12 U	0.15 U	0.11 U	0.12 U	0.12 U	0.22 U
MW1-20	4/13/2005	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
MW1-20	10/12/2005	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
MW1-20	7/12/2006	0.5 U	0.5 U	0.2 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 U
MW1-20	10/16/2006	0.5 U	0.5 U	0.3 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.05 J
MW1-20	6/13/2007	0.5 U	0.5 U	0.2 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 U
MW1-20	10/19/2007	0.5 U	0.5 U	0.2 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 U
MW1-20	5/7/2008	0.5 U	0.5 U	0.2 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 U
MW1-20	10/28/2008	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 U
MW1-20	6/24/2009	0.5 U	0.5 U	0.2 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 U
MW1-20	10/27/2009	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-20	6/15/2010	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-20	10/25/2010	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-20	7/18/2011	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-20	10/25/2011	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-20	6/12/2012	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-20	6/17/2013	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-20	6/17/2014	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-20	6/24/2015	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
MW1-20	6/22/2016	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-20	6/19/2017	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-20[a]	8/24/2022	0.5 U	0.8 U	0.5 U	0.8 UJ	0.8 U	0.8 U	0.8 UJ	0.31 J-	0.5 U
MW1-20[a]	10/26/2022	0.07 U	0.15 U	0.07 U	0.15 U	0.07 U	0.25 U	0.07 U	0.15 U	0.015 U
MW1-20[a]	1/23/2023	0.07 U	0.15 U	0.07 U	0.15 U	0.07 U	0.25 U	0.07 U	0.15 U	0.09 U
Central Landfill – Shallow Groundwater Well										
MW1-17	8/29/1995	1 U	1 U	1 U[1]	6.4	0.94 J	1 U	1 U	1 U	**6.9**
MW1-17	12/4/1995	1 U	1 U	1 U[1]	5.1	1 U	1 U	1 U	1 U	**4.3**
MW1-17	3/6/1996	0.5 U	0.5 U	0.5 U	0.32 J	0.29 J	0.5 U	0.5 U	0.5 U	0.47 J
MW1-17	6/24/1996	0.5 U	0.2 J	0.5 U	1.4 U	0.51	0.4 J	0.5 U	0.5 U	1.2 U[1]
MW1-17	6/7/2000	0.1 J	0.5 U	0.5 U	0.5 U	0.64	0.5 U	0.5 U	0.3 J	0.5 U
MW1-17	6/20/2001	0.12 J	0.12 U	0.12 U	0.12 U	0.71	0.11 U	0.12 U	0.12 U	0.22 U
MW1-17	6/19/2002	0.11 J	0.12 U	0.12 U	0.12 U	0.43 J	0.11 U	0.12 U	0.12 U	**0.66**
MW1-17	4/29/2003	0.091 U	0.12 U	0.12 U	0.18 U	0.39 U	0.11 U	0.12 U	0.12 U	**1.4**
MW1-17	4/22/2004	0.091 U	0.12 U	0.12 U	3.4	0.31 J	0.11 U	0.12 U	0.89	**3.8**
MW1-17	4/14/2005	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
MW1-17	7/10/2006	0.5 UJ	0.5 UJ	0.25 J	50 J	0.23 J	0.5 UJ	0.5 UJ	0.5 UJ	**14 J**
MW1-17	6/14/2007	0.5 U	0.5 U	0.31 J	**76 D**	0.5 U	0.5 U	0.5 U	0.5 U	**14**
MW1-17	5/7/2008	0.5 U	0.5 U	0.19 J	33	0.14 J	0.5 U	0.5 U	0.5 U	**5.9**
MW1-17	6/18/2009	0.5 U	0.5 U	0.43	**100 D**	0.22 J	0.5 U	0.5 U	0.13 J	**18**
MW1-17	6/15/2010	0.5 U	0.5 U	0.42 J	61 D	0.16 J	0.5 U	0.5 U	0.5 U	**15**
MW1-17	7/18/2011	0.5 U	0.5 U	0.42 J	**90** D	0.18 J	0.5 U	0.5 U	0.5 U	**15**
MW1-17	6/12/2012	0.5 U	0.5 U	**1.4** J	**360 D**	0.34 J	0.5 U	0.5 U	0.2 J	**40**

Table C-1. OU 1 Chlorinated VOC Groundwater Sampling Results through April 2023

Location ID	Sampling Date	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	1,1,1-TCA	TCE	Vinyl Chloride
GW Remediation Goals		800	5	0.5	70	100	5	200	5	0.5
MW1-17	6/17/2013	0.5 U	0.5 U	**1.9**	**430 D**	0.55	0.5 U	0.5 U	0.46 J	**89 D**
MW1-17	6/18/2014	0.5 U	0.5 U	**1.5**	**360 D**	0.31 J	0.5 U	0.5 U	0.5 U	**62**
MW1-17	6/24/2015	1 U	1 U	**2.1 D**	**630 D**	0.46 JD	1 U	1 U	1 U	**120 JD**
MW1-17	6/21/2016	0.5 U	0.5 U	**1.6**	**440 D**	0.45 J	0.5 U	0.5 U	0.5 U	**100 D**
MW1-17	6/19/2017	0.5 U	0.5 U	**1.2**	**440 D**	0.39 J	0.5 U	0.5 U	0.5 U	**72**
Deeper Groundwater Wells										
MW1-09	8/21/1995	1 U	1 U	1 U[1]	1 U	1 U	1 U	1 U	1 U	1 U[1]
MW1-09	12/5/1995	1 U	1 U	1 U[1]	1 U	1 U	1 U	1 U	1 U	1 U[1]
MW1-09	3/5/1996	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-09	6/7/2000	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 J	0.5 U
MW1-09	6/17/2002	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.2 U
MW1-09	4/23/2004	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.2 U
MW1-09	7/13/2006	0.5 UJ	0.5 UJ	0.2 UJ	0.17 J	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.2 UJ
MW1-09	5/12/2008	0.5 U	0.5 U	0.2 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 U
MW1-09	6/16/2010	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-09	6/14/2012	0.5 U	0.5 U	0.5 UJ	0.14 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-09	6/24/2014	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-09	6/22/2016	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-09	6/27/2019	0.2 UM	0.2 UM	0.2 U	0.2 UM	0.2 UM	0.2 UM	0.2 UM	0.2 UM	0.02 UM
MW1-25	8/17/1995	4.8	1 U	**7.3**	440 R	35 R	1 U	1 U	98 R	340 R
MW1-25	12/6/1995	3.9	1 U	**6.1**	630 R	38 R	1 U	1 U	74 R	230 R
MW1-25	3/11/1996	0.5 U	0.5 U	**1.1**	**260**	6.3	0.5 U	0.5 U	**11**	**44**
MW1-25	6/25/1996	0.5 U	0.5 U	**4.7 J**	630 R	45 R	0.5 U	0.5 U	74 R	240 R
MW1-25	6/8/2000	6.9	0.3 J	**7.2**	**2,000**	41	0.5 U	0.5 U	**39**	**260**
MW1-25	8/6/2002	8.6 J	10 U[1]	**7.6 J**	**2,000 D**	41 D	10 U[1]	10 U	**20 D**	**240 D**
MW1-25	6/19/2003	67 U	NA	**67 U**	**1,800**	34	67 U[1]	67 U	**14**	**210**
MW1-25	4/22/2004	5.9 D	2.5 U	**6.6 D**	**1,600 D**	33 D	2.5 U	2.5 U	**7.5 D**	**170 D**
MW1-25	7/13/2006	6 D	5 U	**7.3 D**	**1700 D**	37 D	5 U	5 U	4.3 JD	**270 D**
MW1-25	5/8/2008	4.5 D	2.5 U	**4.8 D**	**1200 JD**	28 D	2.5 U	2.5 U	1.3 JD	**210 D**
MW1-25	6/16/2010	4.2 D	2.5 U	**5.1 D**	**1,400 D**	28 D	2.5 U	2.5 U	1.9 JD	**180 D**
MW1-25	6/23/2014	4.9 D	2.5 U	**5.7 D**	**1,300 D**	27 D	2.5 UJ	2.5 U	0.95 JD	**220 D**
MW1-25	6/20/2019	3.6	0.19 U	**2.9**	**1,100 D**	20	0.5 UM	0.2 U	0.43	**270 D**
MW1-28	12/7/1995	1.1	1 U	**5.1**	720 R	58 R	1 U	1 U	2.3	420 R
MW1-28	3/8/1996	2.1	0.5 U	**5**	**320**	78	0.5 U	0.5 U	1.6	**480**
MW1-28	6/25/1996	2.4 J	0.5 U	**6.3**	540 R	78 R	0.5 U	0.5 U	2.2 J	480 R
MW1-28	9/9/1996	2.3	0.5 U	**5.4**	510 R	66 R	0.5 U	0.5 U	1.2	540 R
MW1-28	6/7/2000	3.2	0.5 U	**5.1**	**1,300 J**	74	0.5 U	0.5 U	0.81	**520**
MW1-28	8/6/2002	4.6 J	10 U[1]	**5.4 J**	**1,500 D**	84 D	10 U[1]	10 U	10 U[1]	**600 D**
MW1-28	6/19/2003	50 U	NA	50 U[1]	**1,200**	34	50 U[1]	50 U	50 U[1]	**470**
MW1-28	4/22/2004	3.9	0.5 U	**5.3**	**1,300 D**	71 D	0.5 U	0.5 U	0.52	**540 D**
MW1-28	7/13/2006	6.1 D	5 U	**7.2 D**	**1500 D**	94 D	5 U	5 U	1.6 JD	**710 D**
MW1-28	5/8/2008	6.1 D	2.5 U	**5.7 D**	**1400 D**	78 D	2.5 U	2.5 U	0.9 JD	**650 D**
MW1-28	6/17/2010	6.3 D	2.5 U	**6.1 D**	**1,700 D**	91 D	2.5 U	2.5 U	0.7 JD	**540 D**
MW1-28	6/24/2014	6.2 D	2.5 U	**5.9 D**	**1,600 D**	94 D	2.5 UJ	2.5 U	0.75 JD	**560 D**
MW1-28	6/24/2019	5.6	0.12 J	**5.1**	**1,500 D**	74 D	0.5 U	0.2 U	0.2 U	**590 D**
MW1-29	6/27/2019	0.2 UM	0.2 U	0.2 UM	0.2 UM	0.2 UM	0.5 UM	0.2 UM	0.2 UM	0.02 UJ
MW1-38	6/19/1996	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-38	6/27/1996	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-38	9/10/1996	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Table C-1. OU 1 Chlorinated VOC Groundwater Sampling Results through April 2023

Location ID	Sampling Date	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	1,1,1-TCA	TCE	Vinyl Chloride
GW Remediation Goals		800	5	0.5	70	100	5	200	5	0.5
MW1-38	4/23/2004	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-38	7/13/2006	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-38	5/12/2008	0.5 U	0.5 U	0.2 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 U
MW1-38	6/17/2010	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-38	6/13/2012	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-38	6/24/2014	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
MW1-38	6/22/2016	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW1-38	6/19/2019	0.2 UM	0.2 U	0.2 UM	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.022 M
MW1-38	4/24/2023	0.07 U	0.15 U	0.07 U	0.15 U	0.07 U	0.25 U	0.07 U	0.15 U	0.09 U
MW1-39	6/17/1996	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**0.8**
MW1-39	6/27/1996	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U[1]
MW1-39	9/10/1996	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**0.76**
MW1-39	6/8/2000	0.5 U	0.5 U	0.5 U	0.4 J	0.5 U	0.5 U	0.5 U	0.5 U	**2**
MW1-39	8/6/2002	0.5 U	0.5 U	0.5 U	0.32 J	0.5 U	0.5 U	0.5 U	0.5 U	**1.8**
MW1-39	6/19/2003	1 U	NA	1 U[1]	0.56	1 U	1 U	1 U	1 U	**1.3**
MW1-39	4/23/2004	0.5 U	0.5 U	0.5 U	0.33 J	0.5 U	0.5 U	0.5 U	0.5 U	**2**
MW1-39	7/13/2006	0.5 U	0.5 U	0.2 U	0.45 J	0.5 U	0.5 U	0.5 U	0.5 U	**2.7**
MW1-39	5/12/2008	0.5 U	0.5 U	0.2 U	0.43 J	0.5 U	0.5 U	0.5 U	0.5 U	**2.3**
MW1-39	6/17/2010	0.5 U	0.5 U	0.5 U	0.6	0.5 U	0.5 U	0.5 U	0.5 U	0.09 J
MW1-39	6/13/2012	0.5 U	0.5 U	0.5 U	0.9	0.5 U	0.5 U	0.5 U	0.5 U	**2**
MW1-39	6/24/2014	0.5 U	0.5 U	0.5 U	0.94	0.5 U	0.5 UJ	0.5 U	0.5 U	**2.1**
MW1-39	6/22/2016	0.5 U	0.5 U	0.5 U	0.93	0.5 U	0.5 U	0.5 U	0.5 U	**1.8**
MW1-39	6/17/2019	0.2 UM	0.2 UM	0.2 U	0.65	0.2 UM	0.2 U	0.2 U	0.2 UM	**1.6**
MW1-39	4/24/2023	0.07 U	0.15 U	0.07 U	0.15 U	0.07 U	0.25 U	0.07 U	0.15 U	0.052 J
MW1-60	9/18/2018	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
MW1-60	10/23/2019	0.3 U	0.3 U	0.5 U	0.3 UJ	0.3 U	0.3 U	0.3 U	0.3 UJ	0.015 U
Regional Aquifer Domestic Water-Supply Wells										
Navy #5	12/8/1995	1 U	1 U	1 U[1]	1 U	1 U	1 U	1 U	1 U	1 U[1]
Navy #5	3/3/1998	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Navy #5	6/2/1999	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Navy #5	6/7/2000	0.5 U	0.5 U	0.5 U	0.3 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Navy #5	6/19/2001	0.091 U	0.12 U	0.12 U	0.12 U	0.14 U	0.11 U	0.12 U	0.12 U	0.22 U
Navy #5	6/27/2002	0.091 U	0.12 U	0.12 U	0.12 U	0.14 U	0.11 U	0.12 U	0.12 U	0.22 U
Navy #5	4/30/2003	0.091 U	0.12 U	0.12 U	0.12 U	0.14 U	0.11 U	0.12 U	0.12 U	0.22 U
Navy #5	4/23/2004	0.091 U	0.12 U	0.12 U	0.14 J	0.14 U	0.11 U	0.12 U	0.12 U	0.22 U
Navy #5	6/16/2004	0.091 U	0.12 U	0.12 U	0.12 U	0.14 U	0.11 U	0.12 U	0.12 U	0.22 U
Navy #5	4/14/2005	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Navy #5	7/14/2006	0.5 U	0.5 U	0.2 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 U
Navy #5	6/15/2007	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Navy #5	5/9/2008	0.5 U	0.5 U	0.2 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 U
Navy #5	6/18/2009	0.5 U	0.5 U	0.2 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 U
Navy #5	6/16/2010	0.5 U	0.5 U	0.2 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Navy #5	7/18/2011	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Navy #5	6/13/2012	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Navy #5	6/19/2013	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
Navy #5	6/24/2014	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
Navy #5	6/24/2015	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
Navy #5	6/23/2016	0.5 U	0.5 U	0.5 U	0.07 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Navy #5	6/21/2017	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Table C-1. OU 1 Chlorinated VOC Groundwater Sampling Results through April 2023

Location ID	Sampling Date	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	1,1,1-TCA	TCE	Vinyl Chloride
GW Remediation Goals		800	5	0.5	70	100	5	200	5	0.5
Navy #5	6/11/2019	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 UJQ
PUD	12/8/1995	1 U	1 U	1 U[1]	1 U	1 U	1 U	1 U	1 U	1 U[1]
PUD	3/3/1998	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
PUD	6/2/1999	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
PUD	6/8/2000	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
PUD	6/19/2001	0.091 U	0.12 U	0.12 U	0.12 U	0.14 U	0.11 U	0.12 U	0.12 U	0.22 U
PUD	7/1/2002	0.091 U	0.12 U	0.12 U	0.12 U	0.14 U	0.11 U	0.12 U	0.12 U	0.22 U
PUD	4/30/2003	0.091 U	0.12 U	0.12 U	0.12 U	0.14 U	0.11 U	0.12 U	0.12 U	0.22 U
PUD	4/23/2004	0.091 U	0.12 U	0.12 U	0.12 U	0.14 U	0.11 U	0.12 U	0.12 U	0.22 U
PUD	4/14/2005	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
PUD	7/14/2006	0.5 U	0.5 U	0.2 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 U
PUD	6/14/2007	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
PUD	5/9/2008	0.5 U	0.5 U	0.2 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 U
PUD	6/17/2009	0.5 U	0.5 U	0.2 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 U
PUD	6/16/2010	0.5 U	0.5 U	0.2 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
PUD	7/19/2011	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
PUD	6/13/2012	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
PUD	6/19/2013	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
PUD	6/25/2014	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
PUD	6/25/2015	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
PUD	6/22/2016	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
PUD	6/21/2017	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
PUD	6/10/2019	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 UJQ
Piezometers										
P1-01	6/11/2019	0.2 UM	0.2 U	0.2 U	0.077 JM	0.2 UM	0.5 U	0.2 U	0.2 U	0.02 UJ
P1-02	6/19/2019	0.2 U	0.2 U	0.2 UM	0.1 J	0.2 U	0.5 U	0.2 U	0.2 U	0.064
P1-03	6/27/2019	0.11 JM	0.2 U	0.2 UM	0.085 JM	0.2 UM	0.5 UM	0.2 U	0.2 UM	0.02 UM
P1-04	6/17/2019	0.31	0.2 UM	**1.5**	**480 D**	11	0.5 U	0.2 UM	0.28	**150 D**
P1-05	6/27/2019	0.16 JM	0.3	0.2 UM	0.13 JM	0.38	0.5 UM	0.2 U	0.2 UM	0.02 UM

Notes:

All concentrations are in µg/L.

GW denotes groundwater.

Bold indicates detected value is equal to or exceeds the groundwater remediation goal.

D – the reported result is from a dilution

DCA – dichloroethane

DCE – dichloroethene

J – estimated result

J- – estimated result with a low bias

µg/L – micrograms per liter

M – manual integrated compound

Yellow and green highlight indicates samples collected during this FYR period.

NA – not analyzed

PCE – tetrachloroethene

Q – one or more quality control criteria failed

R – rejected result, quality control indicates the data are not usable

TCA – trichloroethane

TCE – trichloroethene

U – not detected at value shown

U[1] – not detected at value shown and value exceeds remediation goal

UJ – not detected at the estimated value shown

[a] Sample collected post-HVDPE pilot test to evaluate concentrations of cVOCs in groundwater at 1-month, 3-month, and 6-month periods following HVDPE system shutdown

Table C-7. OU 1 PCB Congeners Seep Water Results, June 2019

	SP1-1	SP1-1 (DUP)
Congener	AREA-1-19-220	AREA-1-19-221
PCB-1	16,000	15,000
PCB-2	900	740
PCB-3	7,000 J	5,900 J
PCB-4	210,000 D M J1	170,000 D
PCB-5	1,200 U M	900 U M
PCB-6	160,000 D M	110,000 D M
PCB-7	2,500 M	1,700 M
PCB-8	180,000 D M	120,000 D M
PCB-9	3,900 M	2,700 M
PCB-10	5,900	4,400
PCB-11	4,700 M	3,700 M
PCB-12/13	18,000 M	13,000 M
PCB-14	1,100 U	850 U
PCB-15	100,000 D J1	64,000 D
PCB-16	77,000 D	45,000 D
PCB-17	100,000 D	62,000 D
PCB-18/30	230,000 D	130,000 D
PCB-19	67,000 D J1	39,000 D
PCB-20/28	170,000 D	96,000 D M
PCB-21/33	31,000	20,000 M
PCB-22	38,000 D	22,000 D M
PCB-23	900 U	660 U
PCB-24	190 U	190 U
PCB-25	63,000 D	35,000 D M
PCB-26/29	100,000 D	58,000 D
PCB-27	62,000 D	36,000 D
PCB-31	150,000 D	83,000 D M
PCB-32	63,000 D	36,000 D
PCB-34	2,300 M	1,500 M
PCB-35	960 M	700 U
PCB-36	810 U	590 U
PCB-37	19,000 D J1	13,000 M
PCB-38	900 U	660 U
PCB-39	920 U	670 U
PCB-40/71	46,000 D M	22,000 M
PCB-41	34,000 D	18,000
PCB-42	5,000 M	2,700 M
PCB-43	120,000 D	71,000 D
PCB-44/47/65	25,000 D M	14,000 M
PCB-45	18,000 D	11,000
PCB-46	12,000	6,500
PCB-48	110,000 D	67,000 D
PCB-49/69	65,000 D	34,000
PCB-50/53	9,300 M	4,600 M
PCB-51	210,000 D M	120,000 D M
PCB-52	1,100 J	730 J
PCB-54	190 U M	190 U M
PCB-55	11,000	6,600
PCB-56	1,000 M	490 M
PCB-57	420 M	190 M
PCB-58	20,000	10,000

Table C-7. OU 1 PCB Congeners Seep Water Results, June 2019

	SP1-1	SP1-1 (DUP)
Congener	AREA-1-19-220	AREA-1-19-221
PCB-59/62/75	2,100	1,300 M
PCB-60	53,000	28,000
PCB-61/70/74/76	2,300 M	1,200 M
PCB-63	35,000 D M	16,000 M
PCB-64	44,000 D	19,000
PCB-66	3,400 M	1,600 M
PCB-67	1,600 M	750 M
PCB-68	2,300 M	1,100 M
PCB-72	1,400 U	830 U
PCB-73	3,500 J M	2,000 J
PCB-77	200 U	190 U
PCB-78	570 M	320 M
PCB-79	330	190
PCB-80	310 U M	160 U M
PCB-81	4,800	3,000
PCB-82	5,400 M	2,700 M
PCB-83	43,000 D	16,000
PCB-84	7,600	4,800
PCB-85/116/117	37,000	23,000
PCB-86/87/97/108/119/125	18,000	8,200
PCB-88/91	970 U	580 U
PCB-89	87,000 D	42,000 M
PCB-90/101/113	16,000	9,800 M
PCB-92	1,900 M	850 M
PCB-93/100	2,000 M	910 M
PCB-94	110,000 D M	66,000 D M
PCB-95	2,200	1,100
PCB-96	4,400 M	1,900 M
PCB-98/102	44,000 D M	25,000 D M
PCB-99	1,700 M	780 M
PCB-103	20 J	12 J
PCB-104	12,000 M	7,000 M
PCB-105	680 U	410 U
PCB-106	1,100 M	650 M
PCB-107/124	3,400 M	2,100 M
PCB-109	87,000 D	50,000 D
PCB-110/115	760 U	460 U
PCB-111	610 U M	360 U M
PCB-112	940 U	540 U
PCB-114	47,000 D M J1	27,000 D M
PCB-118	640 U	380 U
PCB-120	650 U	390 U
PCB-121	960 U	580 U
PCB-122	960 U	560 U
PCB-123	1,100 U	650 U
PCB-126	800 U	480 U
PCB-127	5,900	3,200
PCB-128/166	46,000	24,000
PCB-129/138/163	3,100	1,600
PCB-130	510 M	290 M
PCB-131	16,000 M	8,400 M

Table C-7. OU 1 PCB Congeners Seep Water Results, June 2019

	SP1-1	SP1-1 (DUP)
Congener	AREA-1-19-220	AREA-1-19-221
PCB-132	720 M	370 M
PCB-133	3,400 M	1,800 M
PCB-134/143	15,000 M	7,700 M
PCB-135/151	7,500	3,900
PCB-136	1,800	930
PCB-137	770 M	400 M
PCB-139/140	6,300	3,100
PCB-141	250 U	200 U
PCB-142	1,600	800 M
PCB-144	190 U	190 U
PCB-145	6,700	3,400
PCB-146	37,000 M	18,000 M
PCB-147/149	220 U	190 U
PCB-148	190 U	190 U
PCB-150	190 U	190 U
PCB-152	36,000	19,000
PCB-153/168	970 M	500 M
PCB-154	190 U	190 U
PCB-155	3,900 J	2,300 J
PCB-156/157	4,000	2,000
PCB-158	150 J	91 J
PCB-159	200 U M	190 U M
PCB-160	190 U M	190 U M
PCB-161	140 J M	91 J M
PCB-162	2,800	1,500
PCB-164	200 U	190 U
PCB-165	1,800 J	990 J
PCB-167	43 U	28 U
PCB-169	7,300	4,300
PCB-170	2,000	1,200
PCB-171/173	1,100	620
PCB-172	5,600	3,200
PCB-174	340	160 J
PCB-175	930 M	460
PCB-176	3,500	2,000
PCB-177	1,500	750
PCB-178	2,700	1,300 M
PCB-179	14,000	8,000
PCB-180/193	190 U	190 U
PCB-181	88 J M	36 J M
PCB-182	3,600 M	2,200 M
PCB-183	14 J M	6 J M
PCB-184	540 M	220 M
PCB-185	190 U	190 U
PCB-186	8,100 M	3,900 M
PCB-187	23 J	14 J M
PCB-188	310	160 M
PCB-189	1,300 M	740
PCB-190	270	170 J
PCB-191	190 U	190 U
PCB-192	2,000	1,100

Table C-7. OU 1 PCB Congeners Seep Water Results, June 2019

	SP1-1	SP1-1 (DUP)
Congener	AREA-1-19-220	AREA-1-19-221
PCB-194	840	430
PCB-195	1,300	680
PCB-196	75 J	43 J M
PCB-197	2,200	1,200
PCB-198/199	290	150 J M
PCB-200	290	160 J
PCB-201	420	260
PCB-202	1,400	800
PCB-203	190 U	190 U
PCB-204	150 J	70 J
PCB-205	690 J	440 J
PCB-206	76 J	50 J
PCB-207	200	130 J
PCB-208	470	270
PCB-209	2,700 U	1,600 U
Total PCB Congeners (pg/L)	3,519,276	2,080,293
Total PCB Congeners (µg/L)	**3.5193**	**2.0803**
Cleanup Goal (µg/L)	**0.044**	**0.044**

Notes:
All concentrations are in picograms per gram (pg/L), except where noted.
Bold indicates detected concentration exceeds MTCA Method B risk based cleanup level of 0.044 µg/L for total PCBs.
D – the reported from a diluted analysis
J – analyte positively identified, but result is estimated
J1 – the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M – a manual integration was performed by the laboratory analyst
PCB – polychlorinated biphenyl
q – the reported concentration is the estimated maximum possible concentration for this analyte.
The measured ion ratio does not meet qualitative identification criteria and indicates a possible interference.

Table C-8. OU 1 PCB Aroclors Sediment Results, June 2019 and July 2021

Location ID	Sample ID	Sampling Date	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total PCBs
SP1-1	AREA-1-19-250	6/18/2019	14 J	22 UM	22 UM	22 UM	22 UM	22 UM	34.67	**48.67 J**
SP1-1 (DUP)	AREA-1-19-251	6/18/2019	12 J	16.5 UM	16.5 UM	16.5 UM	16.5 UM	16.5 UM	24	**36 J**
MA09	AREA-1-19-252	6/18/2019	6.77 UM J1	6.77 UM	6.77 UM	6.77 UM	6.77 UM	1.15 J	6.77 UM	1.15 J
MA14	AREA-1-19-253	6/18/2019	7.17 UM	7.17 U	7.17 UM	7.17 UM	7.17 UM	1.2 J	7.17 UM	1.2 J
	SD21-MA14	7/20/2021	25 U	25 U	12 U	12 U	12 U	12 U	12 U	25 U
TF21	AREA-1-19-254	6/20/2019	5.58 UM	5.58 U	5.58 UM	5.58 UM	5.58 UM	5.58 U	5.58 UM	5.58 UM
	SD21-TF-21	7/21/2021	27 U	27 U	13 U	13 U	13 U	13 U	13 U	27 U
Sediment Quality Standard (mg/kg OC)			**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**12**

Notes :

All concentrations are in milligrams per kilogram and have been normalized for organic carbon (mg/kg OC).

Bold indicates detected concentration is equal to or exceeds the SQS of 12 mg/kg for total PCBs in sediment.

D – the report results is from a diluted analysis

DUP – field duplicate sample

GW – groundwater

J – analyte positively identified, but result is estimated

J1 – the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria

P – the relative percent difference is greater than 40 percent between the results on the two analytical columns

PCBs – polychlorinated biphenyls

SQS – sediment quality standard

U – the analyte was not detected at or above the indicated practical quantitation limit

UJ – analyte not detected, but the reported quantitation/detection limit is estimated

Table C-9. OU 1 PCB Congeners Sediment Results, June 2019

	SP1-1	SP1-1 (DUP)	MA09	MA14	TF21
Congener	AREA-1-19-250	AREA-1-19-251	AREA-1-19-252	AREA-1-19-253	AREA-1-19-254
PCB-1	550 M	360 M	6.2 J	3.9 J M	7.4 J
PCB-2	100	73 M	43	39 M	83
PCB-3	430	310 M	4.2 J	4.1 J	7.7 J
PCB-4	13,000 D M	13,000 D M	24 M	16 J M	61 M
PCB-5	110 U	110 U	20 U	20 U	20 U
PCB-6	11,000 D M	9,900 D M	23 M	18 J M	43 M
PCB-7	140 M	130 M	20 U	20 U	20 U
PCB-8	13,000 D M	11,000 D M	35 M	29 M	58 M
PCB-9	240 M	200 M	20 U	20 U	20 U
PCB-10	340	380	20 U	20 U	20 U
PCB-11	410 M	370 M	19 J M	23 J M	28 M
PCB-12/13	1,600 M	1,300 M	13 J M	9 J M	9 J M
PCB-14	100 U	100 U	20 U	20 U	20 U
PCB-15	8,300 D	7,400 D M	64 M	58 M	53 M
PCB-16	4,900 D	4,400 D	20	15 J	20
PCB-17	6,700 D	6,000 D	30	18 J	34
PCB-18/30	15,000 D	14,000 D	53	35 J	49
PCB-19	3,600 D	3,800 D	9.5 J	6.7 J M	13 J
PCB-20/28	11,000 D	9,200 D M	110 q	100	94
PCB-21/33	2,400 D M	1,900 M	21 J q	25 J	22 J
PCB-22	2,400 D	1,900 D M	19 J	20	14 J M
PCB-23	100 U	100 U	20 U	20 U	20 U
PCB-24	20 U	20 U	20 U	20 U	20 U
PCB-25	3,400 D	3,000 D M	28 q	20 M	19 J
PCB-26/29	5,800 D	5,000 D	66 q	42 M	35 J
PCB-27	4,300 D	4,400 D	19 J	11 J	21
PCB-31	9,900 D	8,000 D M	100	89	67
PCB-32	4,000 D	3,700 D	18 J	12 J	21
PCB-34	140 M	120 M	20 U	20 U	20 U
PCB-35	110 U	110 U	20 U	2.5 J M	2.3 J M
PCB-36	92 U	94 U M	3.4 J q	20 U	20 U
PCB-37	1,900	1,400 M	29	37	26 M
PCB-38	100 U	100 U	20 U	20 U	20 U
PCB-39	100 U	110 U	20 U	20 U	20 U
PCB-40/71	2,800	2,700	36 J	26 J M	16 J M
PCB-41	170 U	290 U	20 U	20 U	20 U
PCB-42	2,400 D	2,000 D	19 J	16 J	11 J
PCB-43	320 M	340 M	2.8 J M	2.2 J M	20 U
PCB-44/47/65	8,300 D	7,200 D	98	78	50 J
PCB-45	1,900 M	1,800 M	10 J M	7.5 J M	6.7 J M
PCB-46	1,200	1,200	5.3 J	3.6 J	3.6 J
PCB-48	740	730	7.6 J	7 J	4.7 J
PCB-49/69	7,600 D	6,700 D	110	72	59
PCB-50/53	4,000	4,200 D	25 J	14 J	17 J
PCB-51	500 M	440 M	3.2 J M	1.7 J M	2.8 J M
PCB-52	15,000 D	13,000 D M	230 M	190 M	110 M
PCB-54	90	80 M q	0.74 J M	0.71 J M	20 U
PCB-55	31 U M	22 U M	20 U M	20 U M	20 U M
PCB-56	1,100 M	870 M	19 J	27	14 J M
PCB-57	35 M	36 M	20 U	20 U	20 U
PCB-58	31 U	230 M	6 J M	20 U M	1.2 J M
PCB-59/62/75	1,200	1,300	11 J	7.9 J	5.6 J
PCB-60	350 M	260 M	9.2 J	14 J	8.3 J M
PCB-61/70/74/76	4,200 M	3,000 M	85 M	150 M	49 J M q
PCB-63	120 M	100 M	2.1 J M	2.5 J M	1.3 J
PCB-64	2,000	1,900	22	28 M	11 J
PCB-66	3,900 D	3,000 D	79 M	90 M	47 M
PCB-67	180 M	27 M	1.8 J M	2 J M	0.72 J q
PCB-68	75 M	68 M	1.6 J	1.7 J M	1.1 J
PCB-72	120	100 M	2.3 J	2.3 J	1.3 J
PCB-73	91 U	150 U	20 U	20 U	20 U
PCB-77	660	390 M	22	24	20
PCB-78	39 U	28 U	20 U	20 U	20 U
PCB-79	300	100 M	4.9 J	4.5 J M	1.7 J M
PCB-80	100 M	93 M	3.2 J	3.2 J M	0.89 J
PCB-81	45 U M	31 U M	2 U	2 U M	2 U
PCB-82	1,200	770	46	42	9.7 J
PCB-83	660 M	560 M	20 M	15 J M	6.6 J M
PCB-84	4,600 D	2,700 D	84 M	74 M	16 J M
PCB-85/116/117	2,000	1,400	97	110	33 J
PCB-86/87/97/108/119/125	8,500 M	6,000 M	320 M	330 M	79 J M
PCB-88/91	2,000 M	1,400 M	45 M	52 M	13 J M

Table C-9. OU 1 PCB Congeners Sediment Results, June 2019

	SP1-1	SP1-1 (DUP)	MA09	MA14	TF21
Congener	AREA-1-19-250	AREA-1-19-251	AREA-1-19-252	AREA-1-19-253	AREA-1-19-254
PCB-89	230 U	160 U	20 U	20 U	20 U
PCB-90/101/113	18,000 D	10,000 D	530	520	160
PCB-92	3,500 D	2,100 D	100	100	28
PCB-93/100	240 U	230 M	40 U	40 U	40 U
PCB-94	270 U	190 U	20 U	20 U	20 U
PCB-95	16,000 D M	9,400 D M	220 M	260 M	50 M
PCB-96	120	62 M	1.6 J	1.2 J	0.73 J M
PCB-98/102	460 M	360 M	7.4 J M	8 J M	3 J M
PCB-99	5,600 D M	3,900 D M	260 M	260 M	100 M
PCB-103	220 U	150 U	20 U	20 U	20 U
PCB-104	4 J	2 J M	0.25 J	0.24 J M	20 U
PCB-105	4,100 D	2,200 D	220 J J1	270	100
PCB-106	160 U	110 U	20 U	20 U	20 U
PCB-107/124	400	250	9.6 J	21 J	5.2 J
PCB-109	1,200 M	710 M	38 M	50 M	20 M
PCB-110/115	17,000 D	9,900 D	590	680	160
PCB-111	180 U	120 U	20 U	20 U	20 U
PCB-112	140 U M	99 U M	20 U M	20 U M	20 U M
PCB-114	190 U	130 U	7.9 M	11 M	3.3 M
PCB-118	13,000 D B	7,200 B D	590 J J1 B M	690 B	270 B
PCB-120	150 U	100 U	20 U	20 U	20 U
PCB-121	160 U	110 U	20 U	20 U	20 U
PCB-122	230 U	160 U	9.1 J M	11 J M	3.5 J M
PCB-123	200 U	140 M	7.6 M	10 M	4.5 M
PCB-126	500 M	210 M	4.3 U	6.2 U	2.4 U
PCB-127	190 U	130 U	20 U	20 U	20 U
PCB-128/166	4,500 D	2,200	130	150	51
PCB-129/138/163	47,000 D	21,000 D	730	850	310
PCB-130	2,700 D	1,400	45	60	20
PCB-131	290 M	140 M	7.2 J	7.3 J	2 J M
PCB-132	11,000 D	4,900 D	160	180	47 M
PCB-133	510	280 M	6.8 J	9 J	4 J M
PCB-134/143	1,400 M	830 M	28 J M	29 J M	8.5 J M
PCB-135/151	12,000 D	5,600 D	110 M	130	44 M
PCB-136	3,800 D M	1,800 M	48 M	45	16 J
PCB-137	840	530 M	37	46	12 J
PCB-139/140	500 M	270 M	13 J	12 J	4.1 J M
PCB-141	8,600 D	3,600 D	66	84	23
PCB-142	160 U	81 U	20 U	20 U	20 U
PCB-144	1,600 M	800 M	17 J	17 J M	5.8 J
PCB-145	97 U	50 U	20 U	20 U	20 U
PCB-146	6,400 D	2,900 D	67	83	38
PCB-147/149	28,000 D	13,000 D	320	370	130 M
PCB-148	140 U	73 U	20 U	20 U	20 U
PCB-150	100 U	53 U	20 U	20 U	20 U
PCB-152	91 U	47 U	20 U	20 U	20 U
PCB-153/168	43,000 D	19,000 D	440	470	230
PCB-154	650 M	350 M	6.6 J M	5.6 J M	4.2 J
PCB-155	120 U	69 U	20 U	20 U	20 U
PCB-156/157	4,100 D	2,300	90	120	37
PCB-158	4,200 D	1,900	72	76	25
PCB-159	360	170	1.1 J	1.8 J M	0.89 J
PCB-160	130 U M	66 U M	20 U M	20 U M	20 U M
PCB-161	99 U M	51 U M	20 U M	20 U M	20 U M
PCB-162	240 M	120 M	2.5 J M	4.3 J M	1.3 J M
PCB-164	2,800 D	53 U	32	43	12 J
PCB-165	120 U	64 U	20 U	20 U	20 U
PCB-167	2,200 D	1,200	32	42	14
PCB-169	77 M	37 U	2 U	2 U	2 U
PCB-170	19,000 D	7,100 D	47	79	40
PCB-171/173	4,800 D	2,200 M	18 J	28 J	16 J
PCB-172	2,900 D	1,300	7.6 J	13 J	7.1 J
PCB-174	13,000 D	5,200 D	32	61 M	32 M
PCB-175	610	220	2.2 J	2.7 J	2.9 J M
PCB-176	1,500	530	5.1 J	7.2 J	5 J
PCB-177	7,900 D	3,200 D	26	44	27
PCB-178	2,900 D	1,000	11 J	15 J	12 J
PCB-179	5,100 D	1,600	13 J M	21	15 J
PCB-180/193	39,000 D	14,000 D	83 M	140 M	91
PCB-181	120 U	51 U	1.1 J	1.7 J M	20 U
PCB-182	110 M	33 M	0.5 J M	0.29 J M q	0.5 J M
PCB-183	11,000 D M	3,800 D M	32 M	40 M	31 M

Table C-9. OU 1 PCB Congeners Sediment Results, June 2019

Congener	SP1-1 AREA-1-19-250	SP1-1 (DUP) AREA-1-19-251	MA09 AREA-1-19-252	MA14 AREA-1-19-253	TF21 AREA-1-19-254
PCB-184	20	8 J	0.086 J M q	20 U	0.23 J M
PCB-185	950 M	590 M	1.8 J M	2.9 J M	2.4 J M
PCB-186	20 U	20 U	20 U	20 U	20 U
PCB-187	17,000 D M	6,000 D M	51 M	77 M	67 M
PCB-188	51	25	0.5 J M	0.47 J M	0.93 J
PCB-189	800 M	300 M	3.2 M	4.8	2.6 M
PCB-190	3,500 D	1,400	10 J M	16 J M	7.8 J
PCB-191	750	310	2.4 J M	3.1 J M	1.6 J
PCB-192	99 U	41 U	20 U	20 U	20 U
PCB-194	5,900 D	2,600 D	14 J	27	25
PCB-195	2,300 D	1,600	5 J	10 J	8.7 J
PCB-196	4,200 D	1,000	7.2 J	11 J	15 J
PCB-197	210	51	0.71 J	0.81 J M q	1.5 J M
PCB-198/199	6,900 D	1,600	15 J	28 J	31 J
PCB-200	660	200	1.4 J	2.4 J M	2.1 J M
PCB-201	920	240	2.9 J	4.1 J	5.9 J
PCB-202	1,600	620	5.6 J	10 J	11 J
PCB-203	4,500 D	1,100 M	9 J	15 J	14 J
PCB-204	20 U	20 U	20 U	20 U	20 U
PCB-205	410	160	0.79 J	1.5 J	1.2 J M
PCB-206	1,800 D	930	15 J	32	25
PCB-207	280	110	2.1 J	3.6 J M	4.3 J
PCB-208	550	230	6.1 J	14 J	13 J
PCB-209	370	340	25	46	50
Total PCB Congeners (pg/g)	630,842	366,488	7,696	8,522	3,906
Total PCB Congeners (mg/kg)	0.6308	0.3665	0.0077	0.0085	0.0039
Total Organic Carbon	1.50%	2.00%	0.96%	0.92%	1.20%
Total PCB congeners (mg/kg OC)	**42.0561**	**18.3244**	0.8017	0.9263	0.3255
Cleanup Goal (mg/kg)	**12**	**12**	**12**	**12**	**12**

Notes:
All concentrations are in picograms per gram (pg/g), except where noted.
Bold indicates detected concentration exceeds the RG of 12 mg/kg for total PCBs.
B – the analyte was detected above one-half the reporting limit in an associated blank.
D – the reported from a diluted analysis
J – analyte positively identified, but result is estimated
J1 – the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M – a manual integration was performed by the laboratory analyst
PCB – polychlorinated biphenyl
q – the reported concentration is the estimated maximum possible concentration for this analyte.
The measured ion ratio does not meet qualitative identification criteria and indicates a possible interference.

Appendix D: OU 1 DATA COLLECTED DURING FYR PERIOD

Table D-1. Evidence of Biodegradation Potential

Landfill Area	Well ID	Screen Intervals (ft bgs)	2017 Evidence of Biodegradation	2019 Evidence of Biodegradation
South Plantation	MW1-49	5 to 15	Limited	Limited
South Plantation	MW1-50	5 to 15	Limited	Limited
South Plantation	MW1-51	10 to 20	Limited	Limited
South Plantation	MW1-52	7 to 17	Limited	Adequate
South Plantation	MW1-53	5 to 15	Limited	Adequate
South Plantation	MW1-54	29 to 39	Limited	Limited
South Plantation	MW1-55	26.5 to 36.5	Limited	Adequate
South Plantation	MW1-56-12'	8 to 12	Limited	Adequate
South Plantation	MW1-56-24'	20 to 24	Limited	Adequate
South Plantation	MW1-57-10.5'	6 to 10.5	Adequate	Adequate
South Plantation	MW1-57-16'	12 to 16	Limited	Adequate
South Plantation	MW1-57-32'	27 to 32	Limited	Adequate
South Plantation	MW1-58-9'	5 to 9	Limited	Adequate
South Plantation	MW1-58-19'	15 to 19	Limited	Adequate
South Plantation	MW1-58-35'	31 to 35	Limited	Adequate
South Plantation	MW1-59	60 to 70	--	Adequate
South Plantation	MW1-60*	15 to 25	Limited	Inadequate
South Plantation	MW1-66	5 to 20	--	Limited
South Plantation	MW1-68*	37 to 47	--	Adequate
Central Landfill	MW1-42	15 to 25	Limited	Adequate
Central Landfill	MW1-43	15 to 25	Limited	Adequate
Central Landfill	MW1-44	18 to 28	Limited	Adequate
Central Landfill	MW1-45	15 to 25	Limited	Adequate
Central Landfill	MW1-46	24 to 34	Limited	Adequate
Central Landfill	MW1-47	15 to 25	Adequate	Adequate
Central Landfill	MW1-48	15 to 25	Limited	Limited
Central Landfill	MW1-61	3 to 13	--	Adequate
North Plantation	MW1-62	31 to 41	--	Adequate
North Plantation	MW1-63	30 to 40	--	Adequate
North Plantation	MW1-64	45 to 55	--	Adequate
North Plantation	MW1-65	53 to 63	--	Adequate
North Plantation	MW1-67	5 to 15	--	Adequate

---- Well installed in 2019

* Sample from well was not analyzed for natural attenuation parameters.

Table D-2. Predominance of Halorespiring Bacteria, Sulfate Reducing Bacteria, and Methanogenic Microbes

Well ID	Dhc %	Sulfate Reducing Bacterial %	Methanogen %	Total Eubacteria (cells/L)
2019 Central Landfill				
MW1-42	**0.96%**	0.32%	0.08%	2.15E+06
MW1-45	0.46%	**1.71%**	0.08%	1.56E+04
MW1-46	1.45%	**9.57%**	0.01%	7.38E+05
MW1-47	0.57%	**2.89%**	0.01%	1.57E+06
MW1-48	0.04%	**0.69%**	0.08%	1.57E+07
2017 Central Landfill				
MW1-46	0.14%	**6.10%**	0.05%	3.59E+05
MW1-47	0.15%	**3.45%**	0.59%	7.92E+05
MW1-48	0.02%	**1.30%**	0.20%	7.31E+06
2019 South Plantation				
MW1-50	0.00%	**3.49%**	0.01%	9.11E+04
MW1-51	**1.45%**	0.00%	0.55%	1.76E+03
MW1-52	0.36%	**4.04%**	0.01%	1.65E+05
MW1-57-10'	0.04%	0.00%	**0.08%**	3.41E+04
MW1-57-16'	0.01%	0.07%	**0.29%**	5.62E+06
MW1-57-32'	0.69%	**2.25%**	0.59%	1.47E+06
MW1-58-9'	**27.95%**	2.47%	0.10%	6.69E+05
MW1-59	0.05%	0.00%	**0.39%**	2.76E+03
MW1-68	0.00%*	0.00%	0.00%	4.84E+06
2017 South Plantation				
MW1-50	0.00%	**4.15%**	0.00%	5.25E+04
MW1-52	0.02%	**0.60%**	0.11%	4.27E+05
MW1-56-12'	0.00%	0.00%	**0.14%**	3.58E+02
MW1-56-24'	0.00%	0.00%	**1.18%**	7.64E+01
MW1-57-10'	0.00%	0.00%	**0.63%**	2.39E+02
MW1-57-16'	0.02%	0.81%	**4.53%**	4.64E+05
MW1-57-32'	0.29%	**0.93%**	0.60%	1.77E+06

Bold: Highest percentage composition between target halorespiring bacteria, sulfate reducing bacteria, and methanogens.
* Majority of the microbes were identified as *Dehalobacter* (DHBt) with 0.09%.

Table D-3. Effect on cVOC Concentrations from DO, Iron, Sulfate, and Sulfide

	TCE µg/L		Cis-1,2-DCE µg/L		VC µg/L		DO mg/L		Ferrous Iron mg/L	Sulfate mg/L		Sulfide mg/L
	0.5		16		0.029		< 1		> 1	< 20		> 1
Well	**2017**	**2019**	**2017**	**2019**	**2017**	**2019**	**2017**	**2019**	**2017**	**2017**	**2019**	**2019**
Met all key biodegradation indicator criterion												
MW1-47	86.4	< 3	20900	1800	3400	620	0.23	0	1.91	1.97	1.59	1.16
MW1-48	111	< 0.15	438	< 0.15	98.2	0.28	3.95	0.75	1.07	< 0.66	0.363	1.39
MW1-58-19'	27.6	< 0.15	1110	3.1	106	9.1	0.07	0.26	2.18	1.9	< 0.09	1.35
Not all key biodegradation indicator criterion were met												
MW1-46	< 25	< 7.5	8500	4700	2050	1100	0.12	0	2.4	52.5	65.5	1.35
MW1-58-9’	66.6	370	23600	6900	9570	19000	0.56	6.87	1.53	36.2	0.352	1.95

Note:
< = indicates less than
DCE – dichloroethene
DO – dissolved oxygen
mg/L – milligram per liter
TCE – trichloroethene
VC – vinyl chloride
µg/L – microgram per liter

Table D-4. Target VOCs in Direct Push Boring Soil Samples - 2019

Location Name			SP-B090	SP-B090	SP-B090	SP-B090	SP-B91	SP-B91	SP-B93
Sample Name			SP-B090-S-08-190628	SP-B090-S-14-190628	SP-B090-S-15-190628	SP-B090-S-27-190628	SP-B91-S-8-190626	SP-B91-S-30-190626	SP-B93-S-12-190626
Sample Collection Date			6/28/2019	6/28/2019	6/28/2019	6/28/2019	6/26/2019	6/26/2019	6/26/2019
Sample Depth (ft bgs)			8	14	14	27	8	30	12
Sample Type			N	FD	P	N	N	N	N
Analyte Name	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/kg	1.6	2.8 U	2.4 U	4.9 U	2.8 UJ	2.9 U	2.5 U	2.5 UJ
Tetrachloroethene	µg/kg	1.3	2.8 U	2.4 U	4.9 U	2.8 UJ	2.9 U	2.5 U	2.5 UJ
Trans-1,2-Dichloroethene	µg/kg	32	2.8 U	2.4 U	4.9 U	2.8 UJ	2.9 U	2.5 U	**33 J**
1,1,1-Trichloroethane	µg/kg	84	2.8 U	2.4 U	4.9 U	2.8 UJ	2.9 U	2.5 U	2.5 UJ
Chloroethane	µg/kg	2.6	2.8 U	2.4 U	4.9 U	2.8 UJ	2.9 U	2.5 U	2.5 UJ
1,1-Dichloroethane	µg/kg	2.6	2.8 U	2.4 U	4.9 U	2.8 UJ	2.9 U	2.5 U	2.5 UJ
1,1-Dichloroethene	µg/kg	2.5	2.8 U	2.4 U	4.9 U	2.8 UJ	2.9 U	2.5 U	**8.4 J**

Location Name			SP-B93		SP-B93		SP-B94		SP-B94		CL-B95		CL-B95		CL-B95	
Sample Name			SP-B93-S-17-190626		SP-B93-S-40-190626		SP-B94-S-15-190626		SP-B93-S-39-190626		CL-B95-S-7-190627		CL-B95-S-13-190627		CL-B95-S-33-190627	
Sample Collection Date			6/26/2019		6/26/2019		6/26/2019		6/26/2019		6/27/2019		6/27/2019		6/27/2019	
Sample Depth (ft bgs)			17		40		15		39		7		13		33	
Sample Type			N		N		N		N		N		N		N	
Analyte Name	**Result**	**Result**	**Result**		**Result**		**Result**		**Result**		**Result**					
1,2-Dichloroethane	2.4	U	2.4	U	2.3	U	2.4	U	2.4	U	2.1	U	2.6	U	2.5	U
Tetrachloroethene	2.4	U	2.4	U	2.3	U	2.4	U	2.4	U	2.1	UJ	2.6	UJ	2.5	U
Trans-1,2-Dichloroethene	18		18		2.3	U	2.4	U	2.4	U	2.1	U	1.6	J	2.5	U
1,1,1-Trichloroethane	2.4	U	2.4	U	2.3	U	2.4	U	2.4	U	2.1	U	2.6	U	2.5	U
Chloroethane	2.4	U	2.4	U	2.3	U	2.4	U	2.4	U	**3.1**	**J**	2.6	U	2.5	U
1,1-Dichloroethane	2.4	U	2.4	U	2.3	U	2.4	U	2.4	U	2.1	U	2.6	U	2.5	U
1,1-Dichloroethene	**6.5**		**6.5**		2.3	U	2.4	U	2.4	U	2.1	U	2.6	U	2.5	U

Notes:
Samples analyzed using EPA Method 8260C
FD - Field Duplicate; PAL - Project Action Limit
J - The reported value is an estimated concentration.
N – Sample is not part of a duplicate pair. P – Parent sample of field duplicate
R - The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable
U - The analyte was not detected at or above the stated limit. (sometimes validators will elevate the limit due to the "B" qualifier using the 5x/10x rule so this definition is different than the lab description).
UJ - The analyte was not detected at or above the stated sample quantitation limit, which is an estimated value.
µg/kg – micrograms per kilogram
Underlined values represent analytes not detected at or above the stated limit, which exceeds the PAL
Bolded values indicate that the reported concentration exceeds the PAL.

Table D-5. Target VOCs in Sonic Soil Samples – 2019 and 2022

		Location Name	SP-B92	SP-B92	SP-B130	CL-B98	CL-B98	SP-B131	SP-B131	CL-B132
		Sample Name	SP-B92-S-13-191016	SP-B92-S-28-191016	SP-B130-S-65-191002	CL-B98-S-2-191014	CL-B98-S-30-191014	SP-B131-S-6-191015	SP-B131-S-23-191015	CL-B132-S-07-190930
		Sample Collection Date	10/16/2019	10/16/2019	10/2/2019	10/14/2019	10/14/2019	10/15/2019	10/15/2019	9/30/2019
		Sample Depth (ft bgs)	13	28	65	2	30	6	23	7
		Sample Type	N	N	N	N	N	N	N	N
Analyte Name	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/kg	1.6	2.2 U	2.3 U	2.4 U	2.2 U	2.5 U	2.5 U	2.2 U	2.8 U
Tetrachloroethene	µg/kg	1.3	2.2 U	2.3 U	2.4 U	0.7 J	2.5 U	2.5 U	2.2 U	2.8 U
Cis-1,2-Dichloroethene	µg/kg	5.2	2.2 U	2.3 U	2.4 U	2.2 U	**430 J**	2.5 U	**24**	2.8 U
Trans-1,2-Dichloroethene	µg/kg	32	2.2 U	2.3 U	2.4 U	2.2 U	**280 J**	2.5 U	4.1 J	2.8 U
1,1,1-Trichloroethane	µg/kg	84	2.2 U	2.3 U	2.4 U	2.2 U	2.5 U	2.5 U	2.2 U	2.8 U
Chloroethane	µg/kg	2.6	2.2 U	2.3 U	2.4 U	2.2 U	2.5 U	2.5 U	2.2 U	2.8 U
Vinyl Chloride	µg/kg	0.0062	2.2 U	2.3 U	2.4 UJ	2.2 U	**43 J**	2.5 U	**12**	2.8 UJ
1,1-Dichloroethane	µg/kg	2.6	2.2 U	2.3 U	2.4 U	2.2 U	2.5 U	2.5 U	2.2 U	2.8 U
1,1-Dichloroethene	µg/kg	2.5	2.2 U	2.3 U	2.4 U	2.2 U	**23**	2.5 U	2.2 U	2.8 U
Trichloroethene	µg/kg	0.11	2.2 U	2.2 J	2.4 U	**3.6 J**	**410 J**	**3 J**	**6.1**	**3.4 J**

		Location Name	CL-B132	CL-B133	CL-B133	CL-B133	CL-B133	CL-B134	CL-B134	NP-B135
		Sample Name	CL-B132-S-27-190930	CL-B133-S-6-191011	CL-B133-S-13-191011	CL-B133-S-29-191011	CL-B133-S-38-191011	CL-B134-S-49-191003	CL-B134-S-50-191003	NP-B135-S-38-191004
		Sample Collection Date	9/30/2019	10/11/2019	10/11/2019	10/11/2019	10/11/2019	10/3/2019	10/3/2019	10/4/2019
		Sample Depth (ft bgs)	27	6	13	29	38	50	50	38
		Sample Type	N	N	N	N	N	FD	P	N
Analyte Name	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/kg	1.6	2.7 U	2.7 U	2.5 U	2.7 U	2.4 UJ	2.5 U	2.5 U	2.3 U
Tetrachloroethene	µg/kg	1.3	2.7 U	2.7 U	2.5 U	2.7 U	2.4 UJ	2.5 U	2.5 U	2.3 U
Cis-1,2-Dichloroethene	µg/kg	5.2	2.7 U	2.7 U	2.5 U	**9.4**	2.4 UJ	2.5 U	2.5 U	0.8
Trans-1,2-Dichloroethene	µg/kg	32	2.7 U	2.7 U	2.5 U	2.7 U	2.4 UJ	2.5 U	2.5 U	6.9
1,1,1-Trichloroethane	µg/kg	84	2.7 U	2.7 U	2.5 U	2.7 U	2.4 UJ	2.5 U	2.5 U	2.3 U
Chloroethane	µg/kg	2.6	2.7 U	2.7 U	2.5 U	2.7 U	2.4 UJ	2.5 U	2.5 U	2.3 U
Vinyl Chloride	µg/kg	0.0062	2.7 UJ	2.7 U	2.5 U	**17**	2.4 UJ	2.5 UJ	2.5 U	**63 J**
1,1-Dichloroethane	µg/kg	2.6	2.7 U	2.7 U	2.5 U	2.7 U	2.4 UJ	2.5 U	2.5 U	2.3 U
1,1-Dichloroethene	µg/kg	2.5	2.7 U	2.7 U	2.5 U	2.7 U	2.4 UJ	2.5 U	2.5 U	2.3 U
Trichloroethene	µg/kg	0.11	2.7 U	**4.6 J**	**5 J**	**2.5 J**	2.4 UJ	2.5 U	2.5 U	**3.5 J**

Table D-5. Target VOCs in Sonic Soil Samples – 2019 and 2022

Location Name			NP-B135	NP-B136	NP-B136	NP-B137	NP-B138	NP-B138	SP-B139	SP-B139
Sample Name			NP-B135-S-78-191004	NP-B136-S-36-191007	NP-B136-S-66-191007	NP-B137-S-52-191008	NP-B138-S-6-191009	NP-B138-S-62-191009	SP-B139-S-9-191017	SP-B139-S-10-191017
Sample Collection Date			10/4/2019	10/7/2019	10/7/2019	10/8/2019	10/9/2019	10/9/2019	10/17/2019	10/17/2019
Sample Depth (ft bgs)			78	36	66	52	6	62	9	9
Sample Type			N	N	N	N	N	N	P	FD
Analyte Name	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/kg	1.6	3.7 UJ	2.1 U	4.5 U	2.3 U	2.2 UJ	2.2 U	2.4 UJ	2.3 UJ
Tetrachloroethene	µg/kg	1.3	3.7 UJ	2.1 U	4.5 U	2.3 U	2.2 UJ	2.2 U	**11,000 J**	**1,500 J**
Cis-1,2-Dichloroethene	µg/kg	5.2	3.7 UJ	0.46	4.5 U	2.2 J	2.2 UJ	**12**	**47,000 J**	**24,000 J**
Trans-1,2-Dichloroethene	µg/kg	32	3.7 UJ	4.8 J	4.5 U	24	2.2 UJ	2.2 U	**8,400 J**	**1,100 J**
1,1,1-Trichloroethane	µg/kg	84	3.7 UJ	2.1 U	4.5 U	2.3 U	2.2 UJ	2.2 U	2.4 UJ	2.3 UJ
Chloroethane	µg/kg	2.6	3.7 UJ	2.1 U	4.5 U	2.3 U	2.2 UJ	2.2 U	2.4 UJ	2.3 UJ
Vinyl Chloride	µg/kg	0.0062	3.7 UJ	**17 J**	4.5 UJ	**60 J**	2.2 UJ	**17 J**	**230 J**	**79 J**
1,1-Dichloroethane	µg/kg	2.6	3.7 UJ	2.1 U	4.5 U	2.3 U	2.2 UJ	2.2 U	2.4 UJ	2.3 UJ
1,1-Dichloroethene	µg/kg	2.5	3.7 UJ	2.1 U	4.5 U	2.1 J	2.2 UJ	2.2 U	**1,000 J**	**150 J**
Trichloroethene	µg/kg	0.11	3.7 UJ	**3.2 J**	4.5 U	**7.3**	2.2 UJ	2.2 U	**3,200,000 J**	**1,800,000 J**

Location Name			SP-B144	SP-B174	SP-B174	SP-B174	SP-B174	SP-B174	SP-B174	SP-B174
Sample Name			SP-B144-S-50-191016	SP-B174-S-10-220427	SP-B174-S-16-220427	SP-B174-S-20-220427	SP-B174-S-25-220427	SP-B174-S-35-220427	SP-B174-S-45-220427	SP-B174-S-52-220428
Sample Collection Date			10/16/2019	4/27/2022	4/27/2022	4/27/2022	4/27/2022	4/27/2022	4/27/2022	4/28/2022
Sample Depth (ft bgs)			50	10	16	20	25	35	45	52
Sample Type			N	N	N	N	N	N	N	N
Analyte Name	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/kg	1.6	2.3 UJ	0.48 UJ	4.8 UJ	0.55 J	0.48 UJ	0.42 UJ	0.39 UJ	0.35 R
Tetrachloroethene	µg/kg	1.3	2.3 UJ	0.96 UJ	0.95 UJ	1.1 UJ	0.91 UJ	0.84 UJ	0.78 UJ	0.69 UJ
Cis-1,2-Dichloroethene	µg/kg	5.2	2.3 UJ	**660,000 J**	**290 J**	1.9 J	1.8 UJ	1.7 UJ	1.6 UJ	1.4 R
Trans-1,2-Dichloroethene	µg/kg	32	2.3 UJ	**38 J**	3.2 J	1.1 R	0.91 UJ	0.84 UJ	0.78 UJ	0.69 R
1,1,1-Trichloroethane	µg/kg	84	2.3 UJ	0.96 UJ	0.95 UJ	1.1 R	0.91 UJ	0.84 UJ	0.78 UJ	0.69 R
Chloroethane	µg/kg	2.6	2.3 UJ	1.9 UJ	1.9 UJ	2.3 R	1.8 UJ	1.7 UJ	1.6 UJ	1.4 R
Vinyl Chloride	µg/kg	0.0062	2.3 UJ	**11,000 J**	**42 J**	1.1 R	0.91 UJ	0.84 UJ	7.8 UJ	0.69 R
1,1-Dichloroethane	µg/kg	2.6	2.3 UJ	0.61 J	0.48 UJ	0.57 R	0.45 UJ	0.42 UJ	0.39 UJ	0.35 R
1,1-Dichloroethene	µg/kg	2.5	2.3 UJ	**4 J**	2.9 UJ	3.4 R	2.7 UJ	2.5 UJ	2.3 UJ	2.1 R
Trichloroethene	µg/kg	0.11	**53 J**	**180,000 J**	**91 J**	**0.49 J**	0.91 UJ	0.84 UJ	0.78 UJ	**0.43 J**

Table D-5. Target VOCs in Sonic Soil Samples – 2019 and 2022

Location Name			SP-B174	SP-B174	SP-B174	SP-B174	SP-B175	SP-B175	SP-B175	SP-B175
Sample Name			SP-B174-S-70-220428	SP-B174-S-73-220428	SP-B174-S-74-220428	SP-B174-S-83-220428	SP-B175-S-25-220425	SP-B175-S-38-220425	SP-B175-S-50-220425	SP-B175-S-56-220426
Sample Collection Date			4/28/2022	4/28/2022	4/28/2022	4/28/2022	4/25/2022	4/25/2022	4/25/2022	4/26/2022
Sample Depth (ft bgs)			70	73	73	83	25	38	50	56
Sample Type			N	P	FD	N	N	N	N	N
Analyte Name	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/kg	1.6	0.45 UJ	0.65 UJ	0.62 UJ	0.52 UJ	0.46 UJ	0.64 UJ	0.47 UJ	0.47 UJ
Tetrachloroethene	µg/kg	1.3	0.9 UJ	1.3 UJ	1.2 UJ	1 UJ	**3.3 J**	1.3 UJ	0.94 UJ	0.94 UJ
Cis-1,2-Dichloroethene	µg/kg	5.2	1.8 UJ	2.6 UJ	2.5 UJ	2.1 UJ	**3,200 J**	2.6 UJ	1.9 UJ	1.9 UJ
Trans-1,2-Dichloroethene	µg/kg	32	0.9 UJ	1.3 UJ	1.2 UJ	1 UJ	1.3 J	1.3 UJ	0.94 UJ	0.94 UJ
1,1,1-Trichloroethane	µg/kg	84	0.9 UJ	1.3 UJ	1.2 UJ	1 UJ	0.93 UJ	1.3 UJ	0.94 UJ	0.94 UJ
Chloroethane	µg/kg	2.6	1.8 UJ	2.6 UJ	2.5 UJ	2.1 UJ	1.9 UJ	2.6 UJ	1.9 UJ	1.9 UJ
Vinyl Chloride	µg/kg	0.0062	0.9 UJ	1.3 UJ	1.2 UJ	1 UJ	**6.2 J**	1.3 UJ	0.94 UJ	0.94 UJ
1,1-Dichloroethane	µg/kg	2.6	0.45 UJ	0.65 UJ	0.62 UJ	0.52 UJ	0.46 UJ	0.64 UJ	0.47 UJ	0.47 UJ
1,1-Dichloroethene	µg/kg	2.5	2.7 UJ	3.9 UJ	3.7 UJ	3.1 UJ	2.8 UJ	3.9 UJ	2.8 UJ	2.8 UJ
Trichloroethene	µg/kg	0.11	0.9 UJ	1.3 UJ	1.2 UJ	1 UJ	**620 J**	**4.1 J**	0.94 UJ	0.94 UJ

Location Name			SP-B175	SP-B175	SP-B175	SP-B175	SP-B175	SP-B175	CL-B176	CL-B176
Sample Name			SP-B175-S-60-220426	SP-B175-S-64-220426	SP-B175-S-70-220426	SP-B175-S-80-220426	SP-B175-S-90-220426	SP-B175-S-100-220426	CL-B176-S-08-220502	CL-B176-S-28-220502
Sample Collection Date			4/26/2022	4/26/2022	4/26/2022	4/26/2022	4/26/2022	4/26/2022	5/2/2022	5/2/2022
Sample Depth (ft bgs)			60	64	70	80	90	100	8	28
Sample Type			N	N	N	N	N	N	N	N
Analyte Name	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/kg	1.6	0.56 UJ	0.48 UJ	0.49 UJ	0.39 UJ	0.52 UJ	0.44 UJ	0.48 UJ	0.42 UJ
Tetrachloroethene	µg/kg	1.3	1.1 UJ	0.96 UJ	0.99 UJ	0.77 UJ	1 UJ	0.87 UJ	0.96 UJ	0.83 UJ
Cis-1,2-Dichloroethene	µg/kg	5.2	2.2 UJ	1.9 UJ	2 UJ	1.5 UJ	2.1 UJ	1.7 UJ	1.9 UJ	**7400 J**
Trans-1,2-Dichloroethene	µg/kg	32	1.1 UJ	0.96 UJ	0.99 UJ	0.77 UJ	1 UJ	0.87 UJ	0.96 UJ	**33 J**
1,1,1-Trichloroethane	µg/kg	84	1.1 UJ	0.96 UJ	0.99 UJ	0.77 UJ	1 UJ	0.87 UJ	0.96 UJ	0.83 UJ
Chloroethane	µg/kg	2.6	2.2 UJ	1.9 UJ	2 UJ	1.5 UJ	2.1 UJ	1.7 UJ	0.99 J	1.7 UJ
Vinyl Chloride	µg/kg	0.0062	1.1 UJ	0.96 UJ	0.99 UJ	0.77 UJ	1 UJ	0.87 UJ	0.96 UJ	**120 J**
1,1-Dichloroethane	µg/kg	2.6	0.56 UJ	0.48 UJ	0.49 UJ	0.39 UJ	5.2 UJ	0.44 UJ	0.48 UJ	0.42 UJ
1,1-Dichloroethene	µg/kg	2.5	3.3 UJ	2.9 UJ	3 UJ	2.3 UJ	3.1 UJ	2.6 UJ	2.9 UJ	**6.1 J**
Trichloroethene	µg/kg	0.11	1.1 UJ	0.96 UJ	0.99 UJ	0.77 UJ	1 UJ	**0.3 J**	0.96 UJ	0.83 UJ

Table D-5. Target VOCs in Sonic Soil Samples – 2019 and 2022

Notes:
Samples analyzed using EPA Method 8260C
FD - Field Duplicate
J - The reported value is an estimated concentration.
N – Sample is not part of a duplicate pair.
P – Parent sample of field duplicate
PAL - Project Action Limit
R - The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable
U - The analyte was not detected at or above the stated limit. (sometimes validators will elevate the limit due to the "B" qualifier using the 5x/10x rule so this definition is different than the lab description).
UJ - The analyte was not detected at or above the stated sample quantitation limit, which is an estimated value.
µg/kg – micrograms per kilogram
Underlined values represent analytes not detected at or above the stated limit, which exceeds the PAL
Bolded values indicate that the reported concentration exceeds the PAL.

Table D-6. PCB Aroclors in Soil Samples - 2019 and 2022

		Location Name	NP-B118	NP-B118	NP-B118	NP-B119	NP-B119	NP-B119	NP-B120
		Sample Name	NP-B118-S-13-190624	NP-B118-S-16-190624	NP-B118-S-34-190625	NP-B119-S-07-190621	NP-B119-S-12-190621	NP-B119-S-15-190621	NP-B120-S-12.5-190624
		Sample Collection Date	6/24/2019	6/24/2019	6/25/2019	6/21/2019	6/21/2019	6/21/2019	6/24/2019
		Sample Depth (ft bgs)	13	16	34	7	12	15	12.5
		Sample type	N	N	N	N	N	N	N
Analyte	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
AROCLOR-1016	µg/kg	60	26 U	25 U	24 U	25 UJ	27 UJ	25 UJ	**16,000 J**
AROCLOR-1221	µg/kg	NE	26 U	25 U	24 U	25 UJ	27 UJ	25 UJ	5,100 UJ
AROCLOR-1232	µg/kg	NE	13 U	12 U	12 U	13 UJ	14 UJ	12 UJ	2,600 UJ
AROCLOR-1242	µg/kg	NE	13 U	12 U	12 U	13 UJ	14 UJ	12 UJ	2,600 UJ
AROCLOR-1248	µg/kg	NE	13 U	12 U	12 U	13 UJ	14 UJ	12 UJ	2,600 UJ
AROCLOR-1254	µg/kg	2.9	13 U	12 U	12 U	13 UJ	**85 J**	12 UJ	2,600 UJ
AROCLOR-1260	µg/kg	18	13 U	12 U	12 U	13 UJ	14 UJ	12 UJ	2,600 UJ
AROCLOR-1262	µg/kg	NE	15 U	15 U	15 U	15 UJ	16 UJ	15 UJ	3,100 UJ
AROCLOR-1268	µg/kg	NE	15 U	15 U	15 U	15 UJ	16 UJ	15 UJ	3,100 UJ
Total PCB Aroclors	µg/kg	17	26 U	25 U	24 U	25 UJ	**85 J**	25 UJ	**16,000 J**

		Location Name	NP-B120	NP-B120	NP-B120	NP-B120	NP-B121	NP-B121	NP-B121
		Sample Name	NP-B120-S-29-190624	NP-B120-S-35.5-190624	NP-B120-S-42-190624	NP-B120-S-49.5-190624	NP-B121-S-05-190620	NP-B121-S-13-190620	NP-B121-S-14-190620
		Sample Collection Date	6/24/2019	6/24/2019	6/24/2019	6/24/2019	6/20/2019	6/20/2019	6/20/2019
		Sample Depth (ft bgs)	29	35.5	42	49.5	5	13	13
		Sample type	N	N	N	N	N	P	FD
Analyte	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
AROCLOR-1016	µg/kg	60	22 U	23 U	22 U	21 U	48,000 U	29 UJ	15 UJ
AROCLOR-1221	µg/kg	NE	22 U	23 U	22 U	21 U	48,000 U	29 UJ	30 UJ
AROCLOR-1232	µg/kg	NE	11 U	12 U	11 U	11 U	24,000 U	15 UJ	15 UJ
AROCLOR-1242	µg/kg	NE	11 U	12 U	11 U	11 U	24,000 UJ	15 UJ	16 UJ
AROCLOR-1248	µg/kg	NE	11 U	12 U	11 U	11 U	24,000 UJ	15 UJ	15 UJ
AROCLOR-1254	µg/kg	2.9	11 U	12 U	11 U	11 U	**210,000 J**	15 UJ	15 UJ
AROCLOR-1260	µg/kg	18	11 U	12 U	11 U	11 U	24,000 UJ	15 UJ	15 UJ
AROCLOR-1262	µg/kg	NE	13 U	14 U	13 U	13 U	29,000 UJ	18 UJ	18 UJ
AROCLOR-1268	µg/kg	NE	13 U	14 U	13 U	13 U	29,000 UJ	18 UJ	18 UJ
Total PCB Aroclors	µg/kg	17	22 U	23 U	22 U	21 U	**210,000**	29 UJ	30 UJ

Table D-6. PCB Aroclors in Soil Samples - 2019 and 2022 (continued)

		Location Name	NP-B121	NP-B122	NP-B122	NP-B122	NP-B123	NP-B123	NP-B123
		Sample Name	NP-B121-S-34-190620	NP-B122-S-05-190620	NP-B122-S-09-190620	NP-B122-S-27-190621	NP-B123-S-19-190619	NP-B123-S-25-190619	NP-B123-S-40-190619
		Sample Collection Date	6/20/2019	6/20/2019	6/20/2019	6/21/2019	6/19/2019	6/19/2019	6/19/2019
		Sample Depth (ft bgs)	34	5	9	27	19	25	40
		Sample type	N	N	N	N	N	N	N
Analyte	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
AROCLOR-1016	µg/kg	60	24 UJ	**160 J**	2,300 U	25 UJ	31 UJ	28 UJ	28 UJ
AROCLOR-1221	µg/kg	NE	24 UJ	21 UJ	2,300 U	25 UJ	31 UJ	28 UJ	28 UJ
AROCLOR-1232	µg/kg	NE	12 UJ	11 UJ	1,200 U	13 UJ	16 UJ	14 UJ	14 UJ
AROCLOR-1242	µg/kg	NE	12 UJ	11 UJ	1,200 UJ	13 UJ	16 UJ	14 UJ	14 UJ
AROCLOR-1248	µg/kg	NE	12 UJ	11 UJ	1,200 UJ	13 UJ	16 UJ	14 UJ	14 UJ
AROCLOR-1254	µg/kg	2.9	12 UJ	11 UJ	**8,000 J**	13 UJ	**130 J**	14 UJ	14 UJ
AROCLOR-1260	µg/kg	18	12 UJ	11 UJ	1,200 UJ	13 UJ	16 UJ	14 UJ	14 UJ
AROCLOR-1262	µg/kg	NE	14 UJ	13 UJ	1,400 UJ	15 UJ	19 UJ	17 UJ	17 UJ
AROCLOR-1268	µg/kg	NE	14 UJ	13 UJ	1,400 UJ	15 UJ	19 UJ	17 UJ	17 UJ
Total PCB Aroclors	µg/kg	17	24 UJ	**160 J**	**8,000**	25 UJ	**130 J**	28 UJ	28 UJ

Notes:
Samples analyzed using EPA Method 8082 A
FD - Field Duplicate
J - The result is an estimated concentration that is less than the LOQ, but greater than or equal to the DL.
N – Sample is not part of a duplicate pair.
P – Parent sample of field duplicate
PAL - Project Action Limit
U - The compound was analyzed for, but was not detected ("nondetect") at or above the LOD.
UJ - The analyte was not detected at the stated sample quantitation limit, which is an estimated value
Underlined values represent analytes not detected at or above the stated xlimit, which exceeds the PAL
Bolded values indicate that the reported concentration exceeds the PAL.
µg/kg - microgram per kilogram

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Appendix D – OU 1 Data Collection During FYR Period

Table D-7. PCB Congeners in Soil Samples - 2019 and 2022

Location Name		NP-B137	NP-B138	NP-B138	NP-B138	NP-B177	NP-B177	NP-B177	NP-B177	NP-B177	NP-B177	NP-B177	NP-B177	NP-B177	NP-B177	NP-B177	NP-B178	NP-B178	NP-B178	NP-B178	NP-B178	NP-B178	NP-B178	NP-B178	NP-B178
Sample Name		NP-B137-S-52-191008	NP-B138-S-5-191008	NP-B138-S-6-191008	NP-B138-S-62-191008	NP-B177-S-07-220505	NP-B177-S-30-220505	NP-B177-S-35-220505	NP-B177-S-36-220505	NP-B177-S-40-220505	NP-B177-S-45-220505	NP-B177-S-50-220505	NP-B177-S-55-220505	NP-B177-S-60-220505	NP-B177-S-65-220505	NP-B177-S-75-220505	NP-B178-S-07-220509	NP-B178-S-30-220509	NP-B178-S-40-220509	NP-B178-S-48-220509	NP-B178-S-55-220509	NP-B178-S-60-220509	NP-B178-S-65-220509	NP-B178-S-70-220509	NP-B178-S-95-220510	NP-B178-S-100-220510
Sample Collection Date		10/8/2019	10/8/2019	10/8/2019	10/8/2019	5/5/2022	5/5/2022	5/5/2022	5/5/2022	5/5/2022	5/5/2022	5/5/2022	5/5/2022	5/5/2022	5/5/2022	5/5/2022	5/9/2022	5/9/2022	5/9/2022	5/9/2022	5/9/2022	5/9/2022	5/9/2022	5/9/2022	5/10/2022	5/10/2022
Sample Depth (ft bgs)		52	5	6	62	7	30	35	36	40	45	50	55	60	65	75	7	30	40	48	55	60	65	70	95	100
Sample Type		N	FD	P	N	N	N	P	FD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte	PAL	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
PCB-001	NA	11 U	800 J	540	11 U	16 J	29 U	31 U	31 U	32 U	32 U	32 U	35 U	3 U	34 U	39 U	25	35 U	3 U	3 U	3 U	39 U	4 U	3 U	3 U	3 U
PCB-002	NA	11 U	82 J	38 J	11 U	32 U	29 U	31 U	31 U	32 U	32 U	32 U	35 U	3 U	34 U	39 U	22 U	35 U	3 U	3 U	3 U	39 U	4 U	3 U	3 U	3 U
PCB-003	NA	28 U	420 J	140 J	28 U	45 U	41 U	44 U	44 U	46 U	46 U	46 U	5 U	4 U	48 U	5 U	32 U	50 U	4 U	4 U	4 U	5 U	6 U	4 U	4 U	4 U
PCB-004	NA	28 U	1,200 J	940 J	28 U	66	37 U	40 U	40 U	41 U	41 U	41 U	4 U	4 U	43 U	5 U	160	45 U	4 U	4 U	4 U	5 U	5 U	4 U	4 U	3 U
PCB-005	NA	28 U	510 U	52 U	28 U	41 U	37 U	40 U	40 U	41 U	41 U	41 U	4 U	4 U	43 U	5 U	29 U	45 U	4 U	4 U	4 U	5 U	5 U	4 U	4 U	3 U
PCB-006	NA	28 U	430 J	330 J	28 U	11 J	16 U	18 U	18 U	18 U	18 U	18 U	2 U	1 U	19 U	2 U	34	20 U	1 U	1 U	1 U	2 U	2 U	1 U	1 U	1 U
PCB-007	NA	28 U	510 U	52 U	28 U	23 U	21 U	22 U	22 U	23 U	23 U	23 U	3 U	2 U	24 U	28 U	160 UJ	25 U	2 U	2 U	3 U	28 U	3 U	2 U	2 U	2 U
PCB-008	NA	28 U	2,500 J	1,700 J	28 U	55 J	16 U	18 U	18 U	18 U	18 U	18 U	1 U	1 U	19 U	2 U	240 J	20 U	1 U	1 U	1 U	2 U	2 U	1 U	1 U	1 U
PCB-009	NA	28 U	510 U	52 U	28 U	18 U	16 U	18 U	18 U	18 U	18 U	18 U	2 U	1 U	19 U	2 U	110 J	20 U	1 U	1 U	1 U	2 U	2 U	1 U	1 U	1 U
PCB-010	NA	28 U	510 U	52 U	28 U	32 U	29 U	31 U	31 U	32 U	32 U	32 U	3 U	3 U	34 U	39 U	220 U	35 U	3 U	3 U	3 U	39 U	4 U	3 U	3 U	3 U
PCB-011	NA	110 U	2,000 U	210 U	110 U	150 U	140 U	150 U	150 U	150 U	150 U	150 U	16 U	16 U	160 U	180 U	1100 U	160 U	150 U	140 U	160 U	190 U	200 U	150 U	150 U	140 U
PCB-012 AND 013	NA	56 U	1,000 U	100 U	57 U	32 U	29 U	31 U	31 U	32 U	32 U	32 U	3 U	3 U	34 U	39 U	18 J	35 U	3 U	3 U	3 U	39 U	4 U	3 U	3 U	3 U
PCB-014	NA	28 U	510 U	52 U	28 U	18 U	16 U	18 U	18 U	18 U	18 U	18 U	2 U	1 U	19 U	2 U	130 U	20 U	1 U	1 U	1 U	2 U	2 U	1 U	1 U	1 U
PCB-015	NA	28 U	1,800 J	1,400 J	28 U	30	21 U	22 U	22 U	23 U	23 U	23 U	2 U	2 U	24 U	28 U	110	25 U	2 U	2 U	2 U	3 U	28 U	3 U	2 U	2 U
PCB-016	NA	11 U	3,000	3,500	11 U	65	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.1 U	1 U	0.9 U	9.6 U	11 U	120	9.9 U	1 U	0.8 U	0.9 U	1 U	1.2 U	0.9 U	0.8 U	0.8 U
PCB-017	NA	11 U	4,400	4,200	11 U	54	12 U	13 U	13 U	14 U	14 U	14 U	1 U	1 U	14 U	17 U	120	15 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
PCB-019	NA	11 U	850 J	810 J	11 U	20	12 U	13 U	13 U	14 U	14 U	14 U	1 U	1 U	14 U	17 U	120	15 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
PCB-021 AND 033	NA	11 U	3,500 J	4,800	11 U	100	16 U	18 U	18 U	18 U	18 U	18 U	2 U	1 U	19 U	22 U	2600	20 U	1 U	1 U	1 U	2 U	2 U	1 U	1 U	1 U
PCB-022	NA	11 U	2,000	2,500	11 U	61	25 U	26 U	27 U	27 U	28 U	27 U	3 U	2 U	29 U	33 U	1300	30 U	2 U	2 U	2 U	25 U	34 U	3 U	2 U	2 U
PCB-023	NA	5.6 U	100 U	10 U	5.7 U	9 U	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.1 U	1 U	0.9 U	9.6 U	11 U	64 U	9.9 U	1 U	0.8 U	0.9 U	1 U	1.2 U	0.9 U	0.8 U	0.8 U
PCB-024	NA	5.6 U	100 U	84 J	5.7 U	9 U	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.1 U	1 U	0.9 U	9.6 U	11 U	39 J	9.9 U	1 U	0.8 U	0.9 U	1 U	1.2 U	0.9 U	0.8 U	0.8 U
PCB-025	NA	5.6 U	6,700 J	580 J	5.7 U	14 J	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.1 U	1 U	0.9 U	9.6 U	11 U	290	9.9 U	1 U	0.8 U	0.9 U	1 U	1.2 U	0.9 U	0.8 U	0.8 U
PCB-026 AND 029	NA	11 U	19,000 J	1,500 J	11 U	50 U	45 U	49 U	49 U	50 U	50 U	50 U	55 U	52 U	53 U	60 U	640	55 U	49 U	4 U	5 U	62 U	60 U	5 U	4 U	4 U
PCB-027	NA	5.6 U	610 J	590	5.7 U	12 J	12 U	13 U	13 U	14 U	14 U	14 U	1 U	1 U	14 U	17 U	200	15 U	13 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
PCB-028 AND 020	NA	5.4 J	12,000	8,500	5.1 J	210	29 U	31 U	31 U	32 U	32 U	32 U	35 U	33 U	34 U	39 U	4500	35 U	31 U	3 U	3 U	39 U	4 U	3 U	3 U	3 U
PCB-030 AND 018	NA	23 U	6,900	7,000	23 U	120	21 U	22 U	22 U	23 U	23 U	23 U	2 U	2 U	24 U	28 U	2100	25 U	22 U	2 U	2 U	28 U	31 U	2 U	2 U	2 U
PCB-031	NA	5.6 J	12,000	9,800	5.3 J	290	21 U	22 U	22 U	23 U	23 U	23 U	2 U	2 U	24 U	28 U	3500	25 U	23 U	2 U	2 U	24 U	28 U	31 U	2 U	2 U	2 U
PCB-032	NA	11 U	2,400 J	2,500 J	11 U	58	12 U	13 U	13 U	14 U	14 U	14 U	1 U	1 U	14 U	17 U	1400	15 U	13 U	1 U	1 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-034	NA	5.6 U	100 U	58 J	5.7 U	14 U	12 U	13 U	13 U	14 U	14 U	14 U	1 U	1 U	14 U	17 U	90 U	15 U	13 U	1 U	1 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-035	NA	5.6 U	100 U	10 U	5.7 U	18 U	16 U	18 U	18 U	18 U	18 U	18 U	2 U	1 U	19 U	22 U	130 U	20 U	18 U	1 U	1 U	18 U	22 U	25 U	18 U	18 U	17 U
PCB-036	NA	5.6 U	100 U	10 U	5.7 U	9 U	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.1 U	1 U	0.9 U	9.6 U	11 U	64 U	9.9 U	9 U	0.8 U	0.9 U	1 U	1.2 U	0.9 U	0.8 U	0.8 U
PCB-037	NA	5.6 U	2,700	2,000 J	5.7 U	66	12 U	13 U	13 U	14 U	14 U	14 U	1 U	1 U	14 U	17 U	1400	15 U	13 U	1 U	1 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-038	NA	5.6 U	100 U	10 U	5.7 U	9 U	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.1 U	1 U	0.9 U	9.6 U	11 U	64 U	9.9 U	9 U	0.8 U	0.9 U	1 U	1.2 U	0.9 U	0.8 U	0.8 U
PCB-039	NA	5.6 U	100 U	10 U	5.7 U	14 U	12 U	13 U	13 U	14 U	14 U	14 U	1 U	1 U	14 U	17 U	90 U	15 U	13 U	1 U	1 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-040 AND 071	NA	14 U	8,400	5,700	19 J	510	21 U	22 U	22 U	23 U	23 U	23 U	2 U	2 U	24 U	28 U	1200	25 U	22 U	2 U	2 U	24 U	28 U	31 U	2 U	2 U	2 U
PCB-041	NA	11 U	2,000 U	21 U	11 U	14 U	12 U	13 U	13 U	14 U	14 U	14 U	1 U	1 U	14 U	17 U	330	15 U	13 U	1 U	1 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-042	NA	5.6 U	18,000	4,200 J	18 J	250	33 U	35 U	35 U	37 U	37 U	37 U	4 U	3 U	38 U	44 U	770	40 U	34 U	3 U	3 U	38 U	45 U	49 U	35 U	34 U	34 U
PCB-043	NA	5.6 U	1,700 J	10 U	5.7 U	27	12 U	13 U	13 U	14 U	14 U	14 U	1 U	1 U	14 U	17 U	100 J	15 U	13 U	1 U	1 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-044 AND 047 AND 065	NA	9.3 J	100,000	45,000	11 J	1700	37 U	40 U	40 U	41 U	41 U	41 U	4 U	4 U	43 U	50 U	270	45 U	40 U	4 U	4 U	5 U	50 U	4 U	4 U	4 U	3 U
PCB-045	NA	5.6 U	100 U	1,700	5.7 U	150	12 U	13 U	13 U	14 U	14 U	14 U	1 U	1 U	14 U	17 U	660	15 U	13 U	1 U	1 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-046	NA	5.6 U	100 U	10 U	5.7 U	58	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.1 U	1 U	0.9 U	9.6 U	11 U	290	9.9 U	1 U	0.8 U	0.9 U	1 U	1.2 U	0.9 U	0.8 U	0.8 U
PCB-048	NA	5.6 U	2,100	1,600	5.7 U	140	16 U	18 U	18 U	18 U	18 U	18 U	2 U	1 U	19 U	22 U	560	20 U	18 U	1 U	1 U	19 U	22 U	25 U	18 U	18 U	17 U
PCB-050 AND 053	NA	11 U	2,900 J	2,700	11 U	200	54 U	57 U	57 U	59 U	60 U	59 U	65 U	62 U	62 U	72 U	580	65 U	57 U	5 U	6 U	73 U	80 U	66 U	57 U	55 U
PCB-051	NA	5.6 U	100 U	10 U	5.7 U	18 U	16 U	18 U	18 U	18 U	18 U	18 U	2 U	1 U	19 U	22 U	140	20 U	18 U	1 U	1 U	19 U	22 U	25 U	18 U	18 U	17 U
PCB-052	NA	15 J	190,000	120,000	17 J	3700	29 U	31 U	31 U	32 U	33 U	33 U	3 U	3 U	34 U	39 U	360	35 U	3 U	3 U	3 U	39 U	4 U	3 U	3 U	3 U
PCB-054	NA	5.6 U	100 U	20 J	5.7 U	9 U	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.1 U	1 U	0.9 U	9.6 U	11 U	64 U	9.9 U	9 U	0.8 U	0.9 U	1 U	1.2 U	0.9 U	0.8 U	0.8 U
PCB-055	NA	5.6 U	100 U	10 U	5.7 U	9 U	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.1 U	1 U	0.9 U	9.6 U	11 U	65 J	9.9 U	9 U	0.8 U	0.9 U	1 U	1.2 U	0.9 U	0.8 U	0.8 U
PCB-056	NA	5.6 U	8,800	5,600	1.2 J	550	62 U	66 U	66 U	69 U	69 U	69 U	7 U	7 U	72 U	83 U	1100	74 U	67 U	6 U	7 U	84 U	92 U	77 U	66 U	63 U
PCB-057	NA	5.6 U	1,100 J	3,400 J	5.7 U	9 U	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.1 U	1 U	0.9 U	9.6 U	11 U	64 U	9.9 U	9 U	0.8 U	0.9 U	1 U	1.2 U	0.9 U	0.8 U	0.8 U
PCB-058	NA	5.6 U	860 J	10 U	5.7 U	150	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.1 U	1 U	0.9 U	9.6 U	11 U	64 U	9.9 U	9 U	0.8 U	0.9 U	1 U	1.2 U	0.9 U	0.8 U	0.8 U
PCB-059 AND 062 AND 075	NA	17 U	4,900 J	940 J	17 U	73	16 U	18 U	18 U	18 U	18 U	18 U	2 U	1 U	19 U	22 U	310 J	20 U	18 U	1 U	1 U	19 U	22 U	25 U	18 U	18 U	17 U
PCB-060	NA	5.6 U	1,100 J	2,100	5.7 U	250	54 U	57 U	57 U	59 U	60 U	59 U	65 U	62 U	62 U	72 U	610	65 U	58 U	5 U	6 U	73 U	80 U	66 U	57 U	55 U
PCB-061 AND 070 AND 074 AND 076	NA	8 J	120,000	67,000	8.8 J	4000	58 U	62 U	62 U	64 U	64 U	64 U	7 U	6 U	67 U	78 U	4900	69 U	63 U	6 U	6 U	71 U	79 U	86 U	62 U	59 U
PCB-063	NA	5.6 U	3,700 J	850 J	5.7 U	38	12 U	13 U	13 U	14 U	14 U	14 U	1 U	1 U	14 U	17 U	97 J	15 U	13 U	1 U	1 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-064	NA	2.7 J	20,000	12,000	2.7 J	810	66 U	71 U	71 U	73 U	74 U	73 U	82 U	76 U	77 U	89 U	1200	79 U	72 U	7 U	7 U	90 U	99 U	83 U	71 U	67 U

SIXTH FIVE-YEAR REVIEW
NAVAL BASE KITSAP KEYPORT
Appendix D – OU 1 Data Collection During FYR Period

Table D-7. PCB Congeners in Soil Samples - 2019 and 2022

Location Name		NP-B137	NP-B138	NP-B138	NP-B138	NP-B177	NP-B177	NP-B177	NP-B177	NP-B177	NP-B177	NP-B177	NP-B177	NP-B177	NP-B177	NP-B177	NP-B178	NP-B178	NP-B178	NP-B178	NP-B178	NP-B178	NP-B178	NP-B178	NP-B178
Sample Name		NP-B137-S-52-191008	NP-B138-S-5-191008	NP-B138-S-6-191008	NP-B138-S-62-191008	NP-B177-S-07-220505	NP-B177-S-30-220505	NP-B177-S-35-220505	NP-B177-S-36-220505	NP-B177-S-40-220505	NP-B177-S-45-220505	NP-B177-S-50-220505	NP-B177-S-55-220505	NP-B177-S-60-220505	NP-B177-S-65-220505	NP-B177-S-75-220505	NP-B178-S-07-220509	NP-B178-S-30-220509	NP-B178-S-40-220509	NP-B178-S-48-220509	NP-B178-S-55-220509	NP-B178-S-60-220509	NP-B178-S-65-220509	NP-B178-S-70-220509	NP-B178-S-95-220510	NP-B178-S-100-220510
Sample Collection Date		10/8/2019	10/8/2019	10/8/2019	10/8/2019	5/5/2022	5/5/2022	5/5/2022	5/5/2022	5/5/2022	5/5/2022	5/5/2022	5/5/2022	5/5/2022	5/5/2022	5/5/2022	5/9/2022	5/9/2022	5/9/2022	5/9/2022	5/9/2022	5/9/2022	5/9/2022	5/9/2022	5/10/2022	5/10/2022
Sample Depth (ft bgs)		52	5	6	62	7	30	35	36	40	45	50	55	60	65	75	7	30	40	48	55	60	65	70	95	100
Sample Type		N	FD	P	N	N	N	P	FD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte	PAL	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
PCB-066	NA	3.5 J	79,000 J	20,000 J	4.3 J	1400	58 U	62 U	62 U	64 U	64 U	6 U	7 U	6 U	6 U	7 U	250	69 U	6 U	6 U	6 U	7 U	80 U	6 U	6 U	5 U
PCB-067	NA	5.6 U	6,500	10 U	5.7 U	12 J	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9 U	10 U	9.5 U	9.6 U	11 U	100 J	9.9 U	1 U	8.4 U	9.5 U	11 U	13 U	9.2 U	8.8 U	8.4 U
PCB-068	NA	5.6 U	4,300 J	350 J	5.7 U	9 U	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.3 U	10 U	9.5 U	9.6 U	11 U	6 U	9.9 U	1 U	8.4 U	9.5 U	11 U	13 U	9.2 U	8.8 U	8.4 U
PCB-069 AND 049	NA	4.9 J	110,000 J	28,000 J	7.7 J	950	23 U	22 U	22 U	23 U	23 U	23 U	25 U	24 U	24 U	28 U	1500	25 U	2 U	2 U	2 U	28 U	31 U	23 U	22 U	21 U
PCB-072	NA	5.6 U	5,800 J	470 J	5.7 U	20	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.3 U	10 U	9.5 U	9.6 U	11 U	64 U	9.9 U	1 U	8.4 U	9.5 U	11 U	13 U	9.2 U	8.8 U	8.4 U
PCB-073	NA	5.6 U	100 U	10 U	5.7 U	14 U	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	90 U	15 U	1 U	1 U	1 U	14 U	17 U	14 U	13 U	13 U
PCB-077	NA	5.6 U	1,300	640	5.7 U	77	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	280	15 U	1 U	1 U	1 U	14 U	17 U	14 U	13 U	13 U
PCB-078	NA	5.6 U	100 U	10 U	5.7 U	9 U	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.3 U	10 U	9.5 U	9.6 U	11 U	64 U	9.9 U	1 U	8.4 U	9.5 U	11 U	13 U	9.2 U	8.8 U	8.4 U
PCB-079	NA	5.6 U	2,000	1,200	5.7 U	57	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	90 U	15 U	1 U	1 U	1 U	14 U	17 U	14 U	13 U	13 U
PCB-080	NA	5.6 U	100 U	10 U	5.7 U	16 J	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.3 U	10 U	9.5 U	9.6 U	11 U	64 U	9.9 U	1 U	8.4 U	9.5 U	11 U	13 U	9.2 U	8.8 U	8.4 U
PCB-081	NA	5.6 U	100 U	10 U	5.7 U	10 J	16 U	18 U	18 U	18 U	18 U	18 U	20 U	19 U	19 U	22 U	130 U	20 U	1 U	1 U	1 U	2 U	25 U	18 U	18 U	17 U
PCB-082	NA	5.6 U	13,000 J	18,000 J	5.7 U	1000	33 U	35 U	37 U	37 U	38 U	38 U	40 U	38 U	38 U	44 U	90 J	40 U	3 U	3 U	3 U	4 U	49 U	37 U	35 U	34 U
PCB-083	NA	5.6 U	34,000 J	17,000 J	1.8 J	540	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	50 J	15 U	1 U	1 U	1 U	14 U	17 U	14 U	13 U	13 U
PCB-084	NA	5.7 J	75,000 J	69,000 J	5.3 J	2700	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	250 J	15 U	1 U	1 U	1 U	14 U	17 U	14 U	13 U	13 U
PCB-086 AND 087 AND 097 AND 109 AND 119 AND 125	NA	--	--	--	--	5900	78 U	84 U	84 U	87 U	87 U	87 U	95 U	91 U	91 U	110 U	480 J	96 U	8 U	8 U	9 U	110 U	120 U	87 U	84 U	80 U
PCB-088	NA	--	--	--	--	1200	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	1100 J	15 U	1 U	1 U	1 U	14 U	17 U	14 U	13 U	13 U
PCB-088 AND 091	NA	2.1 J	36,000 J	23,000 J	2.4 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-089	NA	5.6 U	100 U	10 U	5.7 U	70	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	97 J	15 U	1 U	1 U	1 U	14 U	17 U	14 U	13 U	13 U
PCB-091		--	--	--	--	14 U	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	90 U	15 U	13 U	1 U	1 U	14 U	17 U	14 U	13 U	13 U
PCB-092	NA	3.6 J	79,000 J	43,000 J	4.6 J	14 U	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	1400	15 U	13 U	1 U	1 U	14 U	17 U	14 U	13 U	13 U
PCB-093 AND 100	NA	11 U	3,100 J	21 U	11 U	18 U	16 U	18 U	18 U	18 U	18 U	18 U	20 U	19 U	19 U	22 U	130 U	20 U	18 U	18 U	19 U	22 U	25 U	18 U	18 U	17 U
PCB-094	NA	5.6 U	100 U	10 U	5.7 U	14 U	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	96 U	15 U	13 U	1 U	1 U	14 U	17 U	14 U	13 U	13 U
PCB-095	NA	17 J	290,000 J	210,000 J	17 J	7500	25 U	26 U	27 U	27 U	28 U	27 U	30 U	29 U	29 U	33 U	7300 J	30 U	2 U	2 U	2 U	34 U	37 U	28 U	26 U	25 U
PCB-096	NA	5.6 U	1,000 J	900 J	5.7 U	48	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.3 U	10 U	9.5 U	9.6 U	11 U	64 U	9.9 U	1 U	8.4 U	9.5 U	11 U	13 U	9.2 U	8.8 U	8.4 U
PCB-098 AND 102	NA	11 U	5,900 J	3,400 J	11 U	230	25 U	26 U	27 U	27 U	28 U	27 U	30 U	29 U	29 U	33 U	240 J	30 U	2 U	2 U	2 U	34 U	37 U	28 U	26 U	25 U
PCB-099	NA	5.2 J	190,000 J	72,000 J	9.7 J	3300	16 U	18 U	18 U	18 U	18 U	18 U	20 U	19 U	19 U	22 U	2600 J	20 U	18 U	18 U	19 U	22 U	25 U	18 U	18 U	17 U
PCB-103	NA	5.6 U	4,800 J	10 U	5.7 U	9 U	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.3 U	10 U	9.5 U	9.6 U	11 U	64 U	9.9 U	1 U	8.4 U	9.5 U	11 U	13 U	9.2 U	8.8 U	8.4 U
PCB-104	NA	5.6 U	12 J	5 J	5.7 U	14 U	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	96 U	15 U	13 U	13 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-105	NA	4.8 J	53,000 J	71,000 J	2.8 J	2900	25 U	26 U	27 U	27 U	28 U	27 U	30 U	29 U	29 U	33 U	1600 J	30 U	2 U	2 U	2 U	34 U	37 U	28 U	26 U	25 U
PCB-106	NA	5.6 U	100 U	10 U	5.7 U	130	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.3 U	10 U	9.5 U	9.6 U	11 U	64 U	9.9 U	1 U	8.4 U	9.5 U	11 U	13 U	9.2 U	8.8 U	8.4 U
PCB-107		--	--	--	--	14 U	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	220 J	15 U	13 U	1 U	1 U	14 U	17 U	14 U	13 U	13 U
PCB-107 AND 124	NA	11 U	4,500 J	5,000 J	11 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-108 AND 119 AND 086 AND 097 AND 125 AND 087	NA	9.8 J	150,000 J	140,000 J	9.1 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-108 AND 124		--	--	--	--	350	25 U	26 U	27 U	27 U	28 U	27 U	30 U	29 U	29 U	33 U	170 J	30 U	2 U	2 U	2 U	34 U	37 U	28 U	26 U	25 U
PCB-109	NA	1.4 J	38,000 J	11,000 J	5.7 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-110 AND 115	NA	15 J	330,000	220,000	18 J	10000	33 U	35 U	35 U	37 U	37 U	37 U	40 U	38 U	38 U	44 U	890	40 U	3 U	3 U	3 U	45 U	49 U	37 U	35 U	34 U
PCB-111	NA	5.6 U	100 U	10 U	5.7 U	18 U	16 U	18 U	18 U	18 U	18 U	18 U	20 U	19 U	19 U	22 U	130 U	20 U	18 U	1 U	1 U	19 U	22 U	25 U	18 U	18 U	17 U
PCB-112	NA	5.2 U	100 U	10 U	5.7 U	9 U	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.3 U	10 U	9.5 U	9.6 U	11 U	64 U	9.9 U	1 U	8.4 U	9.5 U	11 U	13 U	9.2 U	8.8 U	8.4 U
PCB-113 AND 090 AND 101	NA	15 J	360,000	230,000	18 J	9300	25 U	26 U	27 U	27 U	28 U	27 U	30 U	29 U	29 U	33 U	690	30 U	2 U	2 U	2 U	34 U	37 U	28 U	26 U	25 U
PCB-114	NA	5.2 U	3,100	3,900 J	5.7 U	190	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.3 U	10 U	9.5 U	9.6 U	11 U	85 J	9.9 U	1 U	8.4 U	9.5 U	11 U	13 U	9.2 U	8.8 U	8.4 U
PCB-117 AND 116 AND 085	NA	17 U	22,000	21,000	17 U	1500	29 U	31 U	31 U	32 U	33 U	32 U	35 U	33 U	34 U	39 U	120	35 U	3 U	3 U	3 U	39 U	43 U	32 U	31 U	30 U
PCB-118	NA	13	450,000	200,000	15	7000	37 U	40 U	40 U	41 U	42 U	41 U	45 U	43 U	43 U	50 U	400	45 U	4 U	4 U	4 U	5 U	5 U	4 U	4 U	3 U
PCB-120	NA	5.6 U	3,600	10 U	5.7 U	18 U	16 U	18 U	18 U	18 U	18 U	18 U	20 U	19 U	19 U	22 U	130 U	20 U	18 U	1 U	1 U	19 U	22 U	25 U	18 U	18 U	17 U
PCB-121	NA	5.2 U	100 U	10 U	5.7 U	9 U	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.3 U	10 U	9.5 U	9.6 U	11 U	64 U	9.9 U	1 U	8.4 U	9.5 U	11 U	13 U	9.2 U	8.8 U	8.4 U
PCB-122	NA	5.6 U	100 U	2,100	5.7 U	110	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	66 J	15 U	1 U	1 U	1 U	14 U	17 U	14 U	13 U	13 U
PCB-123	NA	5.2 U	100 U	10 U	5.7 U	520	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	84 J	15 U	1 U	1 U	1 U	14 U	17 U	14 U	13 U	13 U
PCB-126	NA	5.6 U	100 U	10 U	5.7 U	77	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	90 U	15 U	1 U	1 U	1 U	14 U	17 U	14 U	13 U	13 U
PCB-127	NA	5.2 U	100 U	10 U	5.7 U	14 U	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	90 U	15 U	13 U	1 U	1 U	14 U	17 U	14 U	13 U	13 U
PCB-128 AND 166	NA	1.3 J	30,000	32,000	11 U	1500	21 U	22 U	22 U	23 U	23 U	23 U	25 U	24 U	24 U	28 U	1300	25 U	22 U	2 U	2 U	28 U	31 U	23 U	22 U	21 U
PCB-130	NA	1.2 J	15,000	13,000	5.7 U	660	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	540	15 U	13 U	1 U	1 U	14 U	17 U	14 U	13 U	13 U
PCB-131	NA	5.6 U	2,500	2,900	5.7 U	160	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.3 U	10 U	9.5 U	9.6 U	11 U	110 J	9.9 U	1 U	8.4 U	9.5 U	11 U	13 U	9.2 U	8.8 U	8.4 U
PCB-132	NA	3.7 J	84,000	62,000	4.2 J	3800	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	2700	15 U	13 U	1 U	1 U	14 U	17 U	14 U	13 U	13 U
PCB-133	NA	5.6 U	2,900	1,700	5.7 U	98	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.3 U	10 U	9.5 U	9.6 U	11 U	53 J	9.9 U	1 U	8.4 U	9.5 U	11 U	13 U	9.2 U	8.8 U	8.4 U
PCB-134		--	--	--	--	590	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.3 U	10 U	9.5 U	9.6 U	11 U	440	9.9 U	1 U	8.4 U	9.5 U	11 U	13 U	9.2 U	8.8 U	8.4 U
PCB-134 AND 143	NA	11 U	13,000	9,900	11 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-136	NA	1.9 J	23,000	20,000	1.2 J	1300	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.3 U	10 U	9.5 U	9.6 U	11 U	720	9.9 U	1 U	8.4 U	9.5 U	11 U	13 U	9.2 U	8.8 U	8.4 U
PCB-137	NA	5.6 U	11,000	11,000	5.7 U	530	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	390	15 U	13 U	1 U	1 U	14 U	17 U	14 U	13 U	13 U
PCB-138 AND 163 AND 129	NA	9.3 J	190,000	190,000	6.5 J	10000	29 U	31 U	31 U	32 U	32 U	32 U	35 U	33 U	34 U	39 U	7500	35 U	31 U	3 U	3 U	39 U	43 U	32 U	31 U	30 U
PCB-139 AND 140	NA	11 U	4,100	3,100	11 U	180	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	130 J	15 U	13 U	1 U	1 U	14 U	17 U	14 U	13 U	13 U
PCB-141	NA	12 J	18,000	23,000	5.7 U	1700	16 U	18 U	18 U	18 U	18 U	18 U	20 U	19 U	19 U	22 U	960	20 U	18 U	18 U	19 U	22 U	25 U	18 U	18 U	17 U

SIXTH FIVE-YEAR REVIEW
NAVAL BASE KITSAP KEYPORT
Appendix D – OU 1 Data Collection During FYR Period

Table D-7. PCB Congeners in Soil Samples - 2019 and 2022

	Location Name	NP-B137	NP-B138	NP-B138	NP-B138	NP-B177	NP-B177	NP-B177	NP-B177	NP-B177	NP-B177	NP-B177	NP-B177	NP-B177	NP-B177	NP-B177	NP-B177	NP-B178	NP-B178	NP-B178	NP-B178	NP-B178	NP-B178	NP-B178	NP-B178	NP-B178	NP-B178
	Sample Name	NP-B137-S-52-191008	NP-B138-S-5-191008	NP-B138-S-6-191008	NP-B138-S-62-191008	NP-B177-S-07-220505	NP-B177-S-30-220505	NP-B177-S-35-220505	NP-B177-S-36-220505	NP-B177-S-40-220505	NP-B177-S-45-220505	NP-B177-S-50-220505	NP-B177-S-55-220505	NP-B177-S-60-220505	NP-B177-S-65-220505	NP-B177-S-70-220505	NP-B177-S-75-220505	NP-B178-S-07-220509	NP-B178-S-30-220509	NP-B178-S-40-220509	NP-B178-S-48-220509	NP-B178-S-55-220509	NP-B178-S-60-220509	NP-B178-S-65-220509	NP-B178-S-70-220509	NP-B178-S-95-220510	NP-B178-S-100-220510
	Sample Collection Date	10/8/2019	10/8/2019	10/8/2019	10/8/2019	5/5/2022	5/5/2022	5/5/2022	5/5/2022	5/5/2022	5/5/2022	5/5/2022	5/5/2022	5/5/2022	5/5/2022	5/5/2022	5/5/2022	5/9/2022	5/9/2022	5/9/2022	5/9/2022	5/9/2022	5/9/2022	5/9/2022	5/9/2022	5/10/2022	5/10/2022
	Sample Depth (ft bgs)	52	5	6	62	7	30	35	36	40	45	50	55	60	65	75	7	30	40	48	55	60	65	70	95	100
	Sample Type	N	FD	P	N	N	N	P	FD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
PCB-142	NA	5.6 U	100 U	10 U	5.7 U	9 U	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9 U	9 U	9.6 U	11 U	9.5 U	64 U	9.9 U	9 U	8.8 U	9.5 U	11 U	12 U	9.2 U	8.8 U	8.4 U
		--:--	--:--	--:--	--:--	14 U	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	14 U	17 U	9 U	15 U	11 U	11 U	14 U	11 U	18 U	14 U	13 U	13 U
PCB-144	NA	5.6 U	4,800	5,700	5.7 U	450	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9 U	9 U	9.6 U	11 U	9.5 U	25	9.9 U	9 U	8.8 U	9.5 U	11 U	12 U	9.2 U	8.8 U	8.4 U
PCB-145	NA	5.6 U	100 U	10 U	5.7 U	9 U	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9 U	9 U	9.6 U	11 U	9.5 U	6.4 U	9.9 U	9 U	8.8 U	9.5 U	11 U	12 U	9.2 U	8.8 U	8.4 U
PCB-146	NA	0.85 J	32,000	18,000	0.91 J	1100	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	14 U	29	15 U	11 U	11 U	14 U	11 U	18 U	14 U	13 U	13 U
PCB-147 AND 149	NA	7.1 J	140,000	100,000	7.2 J	7500	21 U	22 U	22 U	23 U	23 U	23 U	24 U	24 U	28 U	470	25 U	25 U	22 U	22 U	24 U	28 U	31 U	23 U	22 U	21 U
PCB-148	NA	5.6 U	100 U	10 U	5.7 U	14 U	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	9 U	15 U	11 U	11 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-150	NA	5.6 U	100 U	10 U	5.7 U	6.8 J	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	9 U	15 U	11 U	11 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-151 AND 135	NA	2.7 J	49,000	35,000	11 U	2600	16 U	18 U	18 U	18 U	18 U	18 U	20 U	19 U	19 U	22 U	150	20 U	16 U	16 U	19 U	22 U	25 U	18 U	18 U	17 U
PCB-152	NA	5.6 U	100 U	10 U	5.7 U	9.2 J	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9 U	9 U	9.6 U	11 U	9.5 U	6 U	9.9 U	9 U	8.8 U	9.5 U	11 U	12 U	9.2 U	8.8 U	8.4 U
PCB-153 AND 168	NA	6.2 J	160,000	110,000	5.8 J	6600	21 U	22 U	22 U	23 U	23 U	23 U	24 U	24 U	28 U	460	25 U	25 U	22 U	22 U	24 U	28 U	31 U	23 U	22 U	21 U
PCB-154	NA	5.6 U	2,900	1,100	5.7 U	62 J	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9 U	9 U	9.6 U	11 U	9.5 U	64 U	9.9 U	9 U	8.8 U	9.5 U	11 U	12 U	9.2 U	8.8 U	8.4 U
PCB-155	NA	5.6 U	100 U	10 U	5.7 U	14 U	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	13 U	20 U	16 U	11 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-156 AND 157	NA	1.8 J	24,000	26,000	0.81 J	1100	16 U	18 U	18 U	18 U	18 U	18 U	20 U	19 U	19 U	22 U	60	20 U	16 U	16 U	19 U	22 U	25 U	18 U	18 U	17 U
PCB-158	NA	1.3 J	18,000	20,000	5.7 U	970	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9 U	9 U	9.6 U	11 U	9.5 U	68	9.9 U	9 U	8.8 U	9.5 U	11 U	12 U	9.2 U	8.8 U	8.4 U
PCB-159	NA	5.6 U	170 J	190 J	5.7 U	60	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	9 U	15 U	11 U	11 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-160	NA	11 U	200 U	21 U	11 U	14 U	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	9 U	15 U	11 U	11 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-161	NA	5.6 U	100 U	10 U	5.7 U	14 U	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	9 U	15 U	11 U	11 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-162	NA	5.6 U	470 J	540	5.7 U	71	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	9 U	15 U	11 U	11 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-164	NA	5.6 U	13,000	10,000	5.7 U	680	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	50	15 U	11 U	11 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-165	NA	5.6 U	100 U	10 U	5.7 U	9 U	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9 U	9 U	9.6 U	11 U	9.5 U	6.4 U	9.9 U	9 U	8.8 U	9.5 U	11 U	12 U	9.2 U	8.8 U	8.4 U
PCB-167	NA	0.71 J	7,200	7,600 J	0.34 J	370	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9 U	9 U	9.6 U	11 U	9.5 U	26	9.9 U	9 U	8.8 U	9.5 U	11 U	12 U	9.2 U	8.8 U	8.4 U
PCB-169	NA	0.63 U	100 U	10 U	5.7 U	12 J	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9 U	9 U	9.6 U	11 U	9.5 U	6.4 U	9.9 U	9 U	8.8 U	9.5 U	11 U	12 U	9.2 U	8.8 U	8.4 U
PCB-170	NA	5.6 U	12,000	16,000	5.7 U	1400	21 U	22 U	22 U	23 U	23 U	23 U	25 U	24 U	24 U	28 U	85	25 U	22 U	22 U	24 U	28 U	31 U	23 U	22 U	21 U
PCB-171 AND 173	NA	11 U	3,700 J	4,600	11 U	470	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	300	15 U	11 U	11 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-172	NA	5.6 U	1,300 J	1,800	5.7 U	240	29 U	31 U	31 U	32 U	33 U	33 U	34 U	34 U	39 U	160 J	35 U	35 U	31 U	31 U	34 U	41 U	43 U	33 U	31 U	30 U
PCB-174	NA	0.7 U	7,100	8,400	11 U	1600	16 U	18 U	18 U	18 U	18 U	18 U	20 U	19 U	19 U	22 U	860	20 U	16 U	16 U	19 U	23 U	25 U	18 U	18 U	17 U
PCB-175	NA	5.6 U	470 J	570	5.7 U	70	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	90 U	15 U	11 U	11 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-176	NA	5.6 U	1,600 J	1,900	5.7 U	270	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9 U	9 U	9.6 U	11 U	9.5 U	140	9.9 U	9 U	8.8 U	9.5 U	11 U	12 U	9.2 U	8.8 U	8.4 U
PCB-177	NA	5.6 U	5,700	5,900	5.7 U	800	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	470	15 U	13 U	11 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-178	NA	5.6 U	1,800 J	1,800	5.7 U	320	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	180	15 U	13 U	13 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-179	NA	5.6 U	3,100	3,100	5.7 U	720	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9 U	9 U	9.6 U	11 U	9.5 U	360	9.9 U	9 U	8.8 U	9.5 U	11 U	12 U	9.2 U	8.8 U	8.4 U
PCB-180 AND 193	NA	1.4 U	14,000	18,000	1.3 U	2700	21 U	22 U	22 U	23 U	23 U	23 U	25 U	24 U	24 U	28 U	1700	25 U	22 U	22 U	24 U	28 U	31 U	23 U	22 U	21 U
PCB-181	NA	5.6 U	100 J	120 J	5.7 U	14 U	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	90 U	15 U	13 U	13 U	14 U	11 U	19 U	14 U	13 U	13 U
PCB-182	NA	5.6 U	93 J	110 J	5.7 U	14 U	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	90 U	15 U	11 U	11 U	14 U	11 U	19 U	14 U	13 U	13 U
PCB-183	NA	5.6 U	4,700	5,800	1.3 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-183 AND 185		--:--	--:--	--:--	--:--	1200	21 U	22 U	22 U	23 U	23 U	23 U	25 U	24 U	24 U	28 U	700	25 U	22 U	22 U	24 U	28 U	31 U	23 U	22 U	21 U
PCB-184	NA	5.6 U	15 J	12 J	5.7 U	14 U	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	90 U	15 U	11 U	11 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-185	NA	5.6 U	100 U	10 U	5.7 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-186	NA	5.6 U	100 U	7 J	5.7 U	14 U	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	90 U	15 U	11 U	11 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-187	NA	5.6 U	8,300	8,500	5.7 U	1700	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	98	15 U	11 U	11 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-188	NA	5.6 U	20 J	17 J	5.7 U	110 U	90 U	110 U	110 U	110 U	110 U	110 U	120 U	110 U	110 U	130 U	770 U	120 U	110 U	110 U	110 U	130 U	150 U	110 U	110 U	100 U
PCB-189	NA	5.6 U	490	610 J	5.7 U	58	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9 U	10 U	9.5 U	9.6 U	11 U	3 J	9.9 U	9 U	8.8 U	9.5 U	11 U	12 U	9.2 U	8.8 U	8.4 U
PCB-190	NA	5.6 U	1,200	1,400	5.7 U	240	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	140	15 U	11 U	11 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-191	NA	5.6 U	490 J	600	5.7 U	49	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	90 U	15 U	11 U	11 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-192	NA	5.6 U	100 U	10 U	5.7 U	14 U	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	90 U	15 U	11 U	11 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-194	NA	5.6 U	340 J	420	5.7 U	510	16 U	18 U	18 U	18 U	18 U	18 U	20 U	19 U	19 U	22 U	320	20 U	16 U	16 U	19 U	22 U	25 U	18 U	18 U	17 U
PCB-195	NA	5.6 U	65 J	50 J	5.7 U	220	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9 U	10 U	9.5 U	9.6 U	11 U	120 J	9.9 U	9 U	8.8 U	9.5 U	11 U	12 U	9.2 U	8.8 U	8.4 U
PCB-196	NA	5.6 U	290 J	360	5.7 U	310	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9 U	10 U	9.5 U	9.6 U	11 U	220	9.9 U	9 U	8.8 U	9.5 U	11 U	12 U	9.2 U	8.8 U	8.4 U
PCB-197	NA	5.6 U	28 J	30 J	5.7 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-197 AND 200		--:--	--:--	--:--	--:--	90	21 U	22 U	22 U	23 U	23 U	23 U	25 U	24 U	24 U	28 U	160 U	25 U	22 U	22 U	24 U	28 U	31 U	23 U	22 U	21 U
PCB-198 AND 199	NA	11 U	550 J	600	11 U	590	16 U	18 U	18 U	18 U	18 U	18 U	20 U	19 U	19 U	22 U	430	20 U	16 U	16 U	19 U	22 U	25 U	18 U	18 U	17 U
PCB-200	NA	5.6 U	170	80	5.7 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-201	NA	5.6 U	89 J	98 J	5.7 U	93 J	91 U	97 U	97 U	100 U	100 U	100 U	110 U	100 U	110 U	120 U	700 U	110 U	98 U	93 U	100 U	120 U	140 U	100 U	97 U	93 U
PCB-202	NA	5.6 U	130 J	130 J	5.7 U	130	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	110 J	15 U	13 U	13 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-203	NA	5.6 U	87 J	82 J	5.7 U	350	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	230	15 U	13 U	13 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-204	NA	5.6 U	100 U	10 U	5.7 U	9 U	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9 U	10 U	9.5 U	9.6 U	11 U	64 U	9.9 U	9 U	8.8 U	9.5 U	11 U	12 U	9.2 U	8.8 U	8.4 U
PCB-205	NA	5.6 U	100 U	11 J	5.7 U	27	12 U	13 U	13 U	14 U	14 U	14 U	15 U	14 U	14 U	17 U	90 U	15 U	13 U	13 U	14 U	17 U	19 U	14 U	13 U	13 U
PCB-206	NA	5.6 U	95 J	140 J	5.7 U	160	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9 U	10 U	9.5 U	9.6 U	11 U	330	9.9 U	9 U	8.8 U	9.5 U	11 U	12 U	9.2 U	8.8 U	8.4 U
PCB-207	NA	5.6 U	100 U	8 J	5.7 U	26	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9 U	10 U	9.5 U	9.6 U	11 U	44 J	9.9 U	9 U	8.8 U	9.5 U	11 U	12 U	9.2 U	8.8 U	8.4 U
PCB-208	NA	5.6 U	43 J	65 J	5.7 U	53	41 U	44 U	44 U	46 U	46 U	46 U	50 U	48 U	48 U	56 U	320 U	50 U	45 U	44 U	48 U	56 U	63 U	46 U	44 U	42 U
PCB-209	NA	3.1 U	130 J	180 J	2 U	74 J	120 U	130 U	130 U	130 U	130 U	130 U	140 U	140 U	140 U	160 U	560 J	140 U	130 U	130 U	140 U	160 U	180 U	130 U	130 U	120 U
TOTAL PCBs		17,000	186	**3,834,944**	**2,521,200**	199	**127,619**	8.2 U	8.8 U	8.8 U	9.1 U	9.2 U	9.1 U	10 U	9.5 U	9.6 U	11 U	**133,859**	9.9 U	9 U	8.8 U	9.5 U	11 U	12 U	9.2 U	8.8 U	8.4 U

Notes:
FD – Field duplicate
J - The reported value is an estimated concentration.
N – Sample is not part of a field duplicate pair
NA - Not applicable
NE - Not established
P – Parent sample of field duplicate
PCB - polychlorinated biphenyls
U - The analyte was not detected at or above the limit of detection (LOD). (sometimes validators will elevate the limit due to the "B" qualifier using the 5x/10x rule so this definition is different than the lab description).
Bolded values indicate that the reported concentration exceeds the PAL.
pg/g - picograms per gram

Table D-8. Total PCBs (Congeners) in Soil - 2019 and 2022

Location Name	Sample Name	Sample type	Total PCBs (Sum of analyte value with ND as null) Result (pg/g)	Total number of PCBs detections
Soil Cleanup Level			**17,000**	
NP-B137	NP-B137-S-52-191008	N	186	52
NP-B138	NP-B138-S-5-191008	FD	**3,834,944**	159
NP-B138	NP-B138-S-6-191008	P	**2,521,200**	159
NP-B138	NP-B138-S-62-191008	N	199	53
NP-B177	NP-B177-S-07-220505	N	**127,619**	116
NP-B177	NP-B177-S-30-220505	N	8.2 U	0
NP-B177	NP-B177-S-35-220505	P	8.8 U	0
NP-B177	NP-B177-S-36-220505	FD	8.8 U	0
NP-B177	NP-B177-S-40-220505	N	9.1 U	0
NP-B177	NP-B177-S-45-220505	N	9.2 U	0
NP-B177	NP-B177-S-50-220505	N	9.1 U	0
NP-B177	NP-B177-S-55-220505	N	10 U	0
NP-B177	NP-B177-S-60-220505	N	9.5 U	0
NP-B177	NP-B177-S-65-220505	N	9.6 U	0
NP-B177	NP-B177-S-75-220505	N	11 U	0
NP-B178	NP-B178-S-07-220509	N	**133,859**	106
NP-B178	NP-B178-S-30-220509	N	9.9 U	0
NP-B178	NP-B178-S-40-220509	N	9 U	0
NP-B178	NP-B178-S-48-220509	N	8.8 U	0
NP-B178	NP-B178-S-55-220509	N	9.5 U	0

Table D-8. Total PCBs (Congeners) in Soil - 2019 and 2022 (continued)

Location Name	Sample Name	Sample type	Total PCBs (Sum of analyte value with ND as null) Result (pg/g)	Total number of PCBs detections
NP-B178	NP-B178-S-60-220509	N	11 U	0
NP-B178	NP-B178-S-65-220509	N	12 U	0
NP-B178	NP-B178-S-70-220509	N	9.2 U	0
NP-B178	NP-B178-S-95-220510	N	8.8 U	0
NP-B178	NP-B178-S-100-220510	N	8.4 U	0

Notes:
FD – Field duplicate
N – Sample is not part of a field duplicate pair
P – Parent sample of field duplicate
PCB - polychlorinated biphenyls
U - The analyte was not detected at or above the limit of detection (LOD). (sometimes validators will elevate the limit due
to the "B" qualifier using the 5x/10x rule so this definition is different than the lab description).
Bolded values indicate that the reported concentration exceeds the PAL.
pg/g - picograms per gram

Table D-9. TPH in Soil Samples – 2019

Location Name	Sample Name	Sample Collection Date	Sample Depth (ft bgs)	Sample Type	PAL (µg/kg)	TPH-Diesel range C12-C24 (µg/kg)
NP-B118	NP-B118-S-13-190624	6/24/2019	13	N	2,000	**260,000**
	NP-B118-S-16-190624	6/24/2019	16	N	2,000	1,200 U
	NP-B118-S-34-190625	6/25/2019	34	N	2,000	1,200 U
NP-B119	NP-B119-S-07-190621	6/21/2019	7	N	2,000	1,300 U
	NP-B119-S-12-190621	6/21/2019	12	N	2,000	**3,200,000**
	NP-B119-S-15-190621	6/21/2019	15	N	2,000	1,200 U
NP-B120	NP-B120-S-12.5-190624	6/24/2019	12.5	N	2,000	**490,000**
	NP-B120-S-29-190624	6/24/2019	29	N	2,000	1,100 U
	NP-B120-S-35.5-190624	6/24/2019	35.5	N	2,000	1,200 U
	NP-B120-S-42-190624	6/24/2019	42	N	2,000	1,100 U
	NP-B120-S-49.5-190624	6/24/2019	49.5	N	2,000	1,100 U
NP-B121	NP-B121-S-05-190620	6/20/2019	5	N	2,000	**2,000,000**
	NP-B121-S-13-190620	6/20/2019	13	P	2,000	**290,000 J**
	NP-B121-S-14-190620	6/20/2019	13	FD	2,000	**53,000 J**
	NP-B121-S-34-190620	6/20/2019	34	N	2,000	1,200 U
NP-B122	NP-B122-S-05-190620	6/20/2019	5	N	2,000	**1,600,000**
	NP-B122-S-09-190620	6/20/2019	9	N	2,000	**890,000**
	NP-B122-S-27-190621	6/21/2019	27	N	2,000	1,300 U
NP-B123	NP-B123-S-19-190619	6/19/2019	19	N	2,000	**49,000**
	NP-B123-S-25-190619	6/19/2019	25	N	2,000	1,400 U
	NP-B123-S-40-190619	6/19/2019	40	N	2,000	1,400 U
NP-B124	NP-B124-S-10-190620	6/20/2019	10	N	2,000	**50,000**

Table D-9. TPH in Soil Samples – 2019 (continued)

Location Name	Sample Name	Sample Collection Date	Sample Depth (ft bgs)	Sample Type	PAL (µg/kg)	TPH-Diesel range C12-C24 (µg/kg)
	NP-B124-S-14-190620	6/20/2019	14	N	2,000	**150,000**
	NP-B124-S-28-190620	6/20/2019	28	N	2,000	1,300 U
NP-B125	NP-B125-S-20-190619	6/19/2019	20	N	2,000	**88,000**
	NP-B125-S-38-190619	6/19/2019	38	N	2,000	**25,000**
	NP-B125-S-45-190619	6/19/2019	45	N	2,000	1,200 U
NP-B137	NP-B137-S-52-191008	10/8/2019	52	N	2,000	1,200 U
NP-B138	NP-B138-S-5-191009	10/9/2019	6	FD	2,000	**2,700 J**
	NP-B138-S-6-191009	10/9/2019	6	P	2,000	1,100 UJ
	NP-B138-S-62-191009	10/9/2019	62	N	2,000	1,100 U

Notes:
Samples analyzed using EPA Method NWTPH-Dx
FD - Field Duplicate
J - The reported value is an estimated concentration.
P – Parent sample of field duplicate
PAL - Project Action Limit
N – Sample is not part of a duplicate pair.
U - The analyte was analyzed but not detected at or above the stated limit. (sometimes validators will elevate the limit due to the "B" qualifier using the 5x/10x rule so this definition is different than the lab description).
UJ - The analyte was analyzed but not detected. the sample quantitation limit is an estimated value.
Bolded values indicate that the reported concentration exceeds the PAL.
µg/kg - micrograms per kilogram

Table D-10. 1,4-Dioxane in Soil Samples - 2019 and 2022

Location Name	Sample Name	Sample Collection Date	Sample Depth (ft bgs)	Sample Type	PAL (mg/kg)	1,4-Dioxane (mg/kg)
CL-B102	CL-B102-S-14-190617	6/17/2019	14	N	0.00013	0.038 U
	CL-B102-S-19-190617	6/17/2019	19	N	0.00013	0.038 U
	CL-B102-S-33-190617	6/17/2019	33	N	0.00013	0.033 U
CL-B103	CL-B103-S-09-190617	6/17/2019	9	N	0.00013	0.036 U
	CL-B103-S-12-190617	6/17/2019	12	N	0.00013	0.039 U
	CL-B103-S-19-190617	6/17/2019	19	N	0.00013	0.037 U
	CL-B103-S-39-190617	6/17/2019	39	N	0.00013	0.033 U
CL-B105	CL-B105-S-10-190612	6/12/2019	10	N	0.00013	0.99 U
	CL-B105-S-13-190612	6/12/2019	13	N	0.00013	0.80 U
	CL-B105-S-39-190612	6/12/2019	39	N	0.00013	0.032 U
CL-B106	CL-B106-S-20-190610	6/10/2019	20	N	0.00013	0.038 U
	CL-B106-S-27-190610	6/10/2019	27	N	0.00013	0.037 U
	CL-B106-S-33-190610	6/10/2019	33	N	0.00013	0.043 U
CL-B107	CL-B107-S-07-190611	6/11/2019	7	N	0.00013	0.19 U
	CL-B107-S-22-190611	6/11/2019	22	N	0.00013	0.036 U
	CL-B107-S-33-190611	6/11/2019	33	N	0.00013	0.047 U
CL-B108	CL-B108-S-08-190611	6/11/2019	8	N	0.00013	0.18 U
	CL-B108-S-22-190611	6/11/2019	22	N	0.00013	0.036 U
CL-B109	CL-B109-S-03-190611	6/11/2019	3	N	0.00013	0.19 U
	CL-B109-S-18-190611	6/11/2019	18	N	0.00013	0.039 U
	CL-B109-S-37-190611	6/11/2019	37	N	0.00013	0.042 U
NP-B110	NP-B110-S-08-190612	6/12/2019	8	N	0.00013	0.037 U

Table D-10. 1,4-Dioxane in Soil Samples - 2019 and 2022 (continued)

Location Name	Sample Name	Sample Collection Date	Sample Depth (ft bgs)	Sample Type	PAL (mg/kg)	1,4-Dioxane (mg/kg)
	NP-B110-S-14-190612	6/12/2019	14	P	0.00013	1.9 U
	NP-B110-S-16-190612	6/12/2019	14	FD	0.00013	2.0 U
NP-B111	NP-B111-S-10-190612	6/12/2019	10	N	0.00013	0.073 U
	NP-B111-S-19-190612	6/12/2019	19	N	0.00013	0.044 U
	NP-B111-S-39-190612	6/12/2019	39	N	0.00013	0.04 U
NP-B112	NP-B112-S-08-190614	6/14/2019	8	N	0.00013	0.037 U
	NP-B112-S-27-190614	6/14/2019	27	N	0.00013	0.037 U
	NP-B112-S-32-190614	6/14/2019	32	N	0.00013	0.039 U
NP-B113	NP-B113-S-13-190613	6/13/2019	13	N	0.00013	1.8 U
	NP-B113-S-20-190613	6/13/2019	20	N	0.00013	0.036 U
	NP-B113-S-27-190613	6/13/2019	27	N	0.00013	0.036 U
NP-B114	NP-B114-S-08-190613	6/13/2019	8	N	0.00013	0.75 U
	NP-B114-S-15-190613	6/13/2019	15	N	0.00013	0.04 U
	NP-B114-S-23-190613	6/13/2019	23	N	0.00013	0.038 U
	NP-B114-S-33-190613	6/13/2019	33	N	0.00013	0.033 U
NP-B115	NP-B115-S-04-190614	6/14/2019	4	N	0.00013	1.8 U
	NP-B115-S-09-190614	6/14/2019	9	N	0.00013	4.7 U
	NP-B115-S-27-190614	6/14/2019	27	N	0.00013	0.035 U
NP-B116	NP-B116-S-13-190621	6/21/2019	13	N	0.00013	0.04 U
	NP-B116-S-22-190624	6/24/2019	22	N	0.00013	0.033 U
	NP-B116-S-34-190624	6/24/2019	34	N	0.00013	0.035 U
NP-B117	NP-B117-S-10-190613	6/13/2019	10	N	0.00013	0.034 U

Table D-10. 1,4-Dioxane in Soil Samples - 2019 and 2022 (continued)

Location Name	Sample Name	Sample Collection Date	Sample Depth (ft bgs)	Sample Type	PAL (mg/kg)	1,4-Dioxane (mg/kg)
NP-B117s	NP-B117S-S-10-190613	6/13/2019	10	N	0.00013	2.3 U
	NP-B117S-S-28-190613	6/13/2019	28	N	0.00013	0.034 U
	NP-B117S-S-39-190613	6/13/2019	39	N	0.00013	0.49 U
NP-B118	NP-B118-S-13-190624	6/24/2019	13	N	0.00013	0.38 UJ
	NP-B118-S-16-190624	6/24/2019	16	N	0.00013	0.37 U
	NP-B118-S-34-190625	6/25/2019	34	N	0.00013	0.036 U
NP-B119	NP-B119-S-07-190621	6/21/2019	7	N	0.00013	0.038 U
	NP-B119-S-12-190621	6/21/2019	12	N	0.00013	0.041 U
	NP-B119-S-15-190621	6/21/2019	15	N	0.00013	0.037 U
NP-B120	NP-B120-S-12.5-190624	6/24/2019	12.5	N	0.00013	19 U
	NP-B120-S-29-190624	6/24/2019	29	N	0.00013	0.033 U
	NP-B120-S-35.5-190624	6/24/2019	35.5	N	0.00013	0.035 U
	NP-B120-S-42-190624	6/24/2019	42	N	0.00013	0.033 U
	NP-B120-S-49.5-190624	6/24/2019	49.5	N	0.00013	0.032 U
NP-B121	NP-B121-S-05-190620	6/20/2019	5	N	0.00013	1.8 U
	NP-B121-S-13-190620	6/20/2019	13	P	0.00013	2.2 U
	NP-B121-S-14-190620	6/20/2019	13	FD	0.00013	1.8 U
	NP-B121-S-34-190620	6/20/2019	34	N	0.00013	0.035 U
NP-B122	NP-B122-S-05-190620	6/20/2019	5	N	0.00013	32 U
	NP-B122-S-09-190620	6/20/2019	9	N	0.00013	1.8 U
	NP-B122-S-27-190621	6/21/2019	27	N	0.00013	0.038 U
NP-B123	NP-B123-S-19-190619	6/19/2019	19	N	0.00013	4.7 U

Table D-10. 1,4-Dioxane in Soil Samples - 2019 and 2022 (continued)

Location Name	Sample Name	Sample Collection Date	Sample Depth (ft bgs)	Sample Type	PAL (mg/kg)	1,4-Dioxane (mg/kg)
	NP-B123-S-25-190619	6/19/2019	25	N	0.00013	0.041 U
	NP-B123-S-40-190619	6/19/2019	40	N	0.00013	0.041 U
NP-B124	NP-B124-S-10-190620	6/20/2019	10	N	0.00013	1.4 U
	NP-B124-S-14-190620	6/20/2019	14	N	0.00013	1.5 U
	NP-B124-S-28-190620	6/20/2019	28	N	0.00013	0.038 U
NP-B125	NP-B125-S-20-190619	6/19/2019	20	N	0.00013	0.042 U
	NP-B125-S-38-190619	6/19/2019	38	N	0.00013	0.036 U
	NP-B125-S-45-190619	6/19/2019	45	N	0.00013	0.036 U
CL-B176	CL-B176-S-08-220502	5/2/2022	8	N	0.00013	0.011 U
	CL-B176-S-28-220502	5/2/2022	28	N	0.00013	0.011 U
	CL-B176-S-40-220502	5/2/2022	40	N	0.00013	0.011 U
	CL-B176-S-45-220502	5/2/2022	45	N	0.00013	0.0092 U
	CL-B176-S-55-220503	5/3/2022	55	N	0.00013	0.01 U
	CL-B176-S-60-220503	5/3/2022	60	N	0.00013	0.014 U
	CL-B176-S-65-220503	5/3/2022	65	N	0.00013	0.013 U
	CL-B176-S-70-220503	5/3/2022	70	N	0.00013	0.013 U
	CL-B176-S-95-220503	5/3/2022	95	N	0.00013	0.011 U
	CL-B176-S-100-220503	5/3/2022	100	N	0.00013	0.01 U
NP-B177	NP-B177-S-07-220505	5/5/2019	7	N	0.00013	0.01 UJ
	NP-B177-S-30-220505	5/5/2019	30	N	0.00013	0.01 UJ
	NP-B177-S-35-220505	5/5/2019	35	P	0.00013	0.01 UJ
	NP-B177-S-36-220505	5/5/2019	35	FD	0.00013	0.011 UJ

Table D-10. 1,4-Dioxane in Soil Samples - 2019 and 2022 (continued)

Location Name	Sample Name	Sample Collection Date	Sample Depth (ft bgs)	Sample Type	PAL (mg/kg)	1,4-Dioxane (mg/kg)
	NP-B177-S-40-220505	5/5/2019	40	N	0.00013	0.011 UJ
	NP-B177-S-45-220505	5/5/2019	45	N	0.00013	0.011 U
	NP-B177-S-50-220505	5/5/2019	50	N	0.00013	0.011 UJ
	NP-B177-S-55-220505	5/5/2019	55	N	0.00013	0.011 UJ
	NP-B177-S-60-220505	5/5/2019	60	N	0.00013	0.012 UJ
	NP-B177-S-65-220505	5/5/2019	65	N	0.00013	0.011 UJ
	NP-B177-S-75-220505	5/5/2019	75	N	0.00013	0.014 UJ
NP-B178	NP-B178-S-07-220509	5/9/2019	7	N	0.00013	0.011 R
	NP-B178-S-30-220509	5/9/2019	30	P	0.00013	0.012 U
	NP-B178-S-32-220509	5/9/2019	30	FD	0.00013	0.011 U
	NP-B178-S-40-220509	5/9/2019	40	N	0.00013	0.011 U
	NP-B178-S-48-220509	5/9/2019	48	N	0.00013	0.0098 UJ
	NP-B178-S-55-220509	5/9/2019	55	N	0.00013	**0.0058 J**
	NP-B178-S-60-220509	5/9/2019	60	N	0.00013	0.013 U
	NP-B178-S-65-220509	5/9/2019	65	N	0.00013	0.015 U
	NP-B178-S-70-220509	5/9/2019	70	N	0.00013	0.011 U
	NP-B178-S-95-220510	5/10/2019	95	N	0.00013	0.011 UJ
	NP-B178-S-100-220510	5/10/2019	100	N	0.00013	0.011 UJ
DG-B179	DG-B179-S-4-220712	7/12/2022	4	N	0.00013	0.01 R
	DG-B179-S-16-220712	7/12/2022	16	N	0.00013	0.0086 UJ
	DG-B179-S-30-220712	7/12/2022	30	N	0.00013	0.01 UJ
	DG-B179-S-43-220712	7/12/2022	43	N	0.00013	0.011 UJ

Table D-10. 1,4-Dioxane in Soil Samples - 2019 and 2022 (continued)

Location Name	Sample Name	Sample Collection Date	Sample Depth (ft bgs)	Sample Type	PAL (mg/kg)	1,4-Dioxane (mg/kg)
	DG-B179-S-50-220713	7/13/2022	50	P	0.00013	0.0091 UJ
	DG-B179-S-50-220713 (FD)	7/13/2022	50	FD	0.00013	0.011 U
	DG-B179-S-55-220713	7/13/2022	55	N	0.00013	0.0099 UJ
	DG-B179-S-60-220713	7/13/2022	60	N	0.00013	0.014 UJ
DG-B180	DG-B180-S-57-220711	7/11/2022	57	N	0.00013	0.013 UJ
	DG-B180-S-65-220711	7/11/2022	65	N	0.00013	0.012 UJ
	DG-B180-S-73-220712	7/12/2022	73	N	0.00013	0.011 UJ
	DG-B180-S-76-220712	7/12/2022	76	N	0.00013	0.012 UJ
	DG-B180-S-79-220712	7/12/2022	79	N	0.00013	0.011 UJ

Notes:
Samples analyzed using EPA Method 8270D.
FD - Field Duplicate; PAL - Project Action Limit; mg/kg - milligrams per kilogram
J - The reported value is an estimated concentration. P – Parent sample of field duplicate. N – Sample is not part of a field duplicate pair
U - The analyte was not detected at or above the stated limit. (sometimes validators will elevate the limit due to the "B" qualifier using the 5x/10x rule so this definition is different than the lab description).
UJ - The analyte was analyzed but not detected. the sample quantitation limit is an estimated value.
Underlined values represent analytes not detected at or above the stated limit, which exceeds the PAL.
Bolded values indicate that the reported concentration exceeds the PAL.

Table D-11. Total Organic Carbon and Moisture Content in Soil - 2019 and 2022

Location Name	Sample Name	Sample Collection Date	Sample Depth (ft bgs)	Sample Type	Moisture Content (%wt)	TOC (mg/kg)
SP-B92	SP-B92-S-12-191016	10/16/2019	13	FD	10.6	2,300
	SP-B92-S-13-191016	10/16/2019	13	P	9.7	2,000
	SP-B92-S-28-191016	10/16/2019	28	N	11.4	790
SP-B131	SP-B131-S-6-191015	10/15/2019	6	N	18.9	3,900
	SP-B131-S-23-191015	10/15/2019	23	N	8.1	380
CL-B107	CL-B107-S-07-190611	6/11/2019	7	N	22.3	18,000
	CL-B107-S-22-190611	6/11/2019	22	N	15.8	280
	CL-B107-S-33-190611	6/11/2019	33	N	36.1	26,000
CL-B132	CL-B132-S-07-190930	9/30/2019	7	N	27.9	5,600
	CL-B132-S-27-190930	9/30/2019	27	N	26.1	4,700
SP-B174	SP-B174-S-10-220427	4/27/2022	10	N	21.7	500 U
	SP-B174-S-48-220427	4/27/2022	48	N	NA	890 J
	SP-B174-S-58-220428	4/28/2022	58	N	NA	3,800
SP-B175	SP-B175-S-15-220425	4/25/2022	15	N	NA	1,400 J
	SP-B175-S-25-220425	4/25/2022	25	N	14	7,600
	SP-B175-S-38-220425	4/25/2022	38	N	30.9	3,800
CL-B176	CL-B176-S-25-220502	5/2/2022	25	N	NA	1,000 J
	CL-B176-S-45-220502	5/2/2022	45	N	3.1	670 J
	CL-B176-S-55-220503	5/3/2022	55	N	23.3	18,000
NP-B177	NP-B177-S-40-220505	5/5/2022	40	N	14	100 J
	NP-B177-S-65-220505	5/5/2022	65	N	17.4	1,400 J
	NP-B177-S-75-220505	5/5/2022	75	N	29.2	110,000

Table D-11. Total Organic Carbon and Moisture Content in Soil - 2019 and 2022 (continued)

Location Name	Sample Name	Sample Collection Date	Sample Depth (ft bgs)	Sample Type	Moisture Content (%wt)	TOC (mg/kg)
NP-B178	NP-B178-S-30-220509	5/9/2022	30	N	19.6	110 J
	NP-B178-S-50-220509	5/9/2022	50	N	NA	540 J
	NP-B178-S-58-220509	5/9/2022	58	N	NA	99,000
DG-B179	DG-B179-S-30-220712	7/12/2022	30	N	17	250 J
	DG-B179-S-45-220712	7/12/2022	45	N	NA	1,700 J
	DG-B179-S-55-220712	7/12/2022	55	N	14.3	1,100 J
DG-B180	DG-B180-S-70-220712	7/12/2022	70	N	NA	26,000

Notes:
TOC - Total Organic Carbon; No PAL designated for TOC
TOC analyzed by Walkley-Black Method (2019) or EPA 9060A (2022)
FD - Field Duplicate
P – Parent sample of field duplicate
N – Sample is not part of a duplicate pair.
NA - Not Analyzed
mg/kg – milligrams per kilogram

Table D-12. Physical Properties of Soil – 2022

Location Name		SP-B174			SP-B175			CL-B176		
Sample Name		SP-B174-S-10-220427	SP-B174-S-48-220427	SP-B174-S-58-220428	SP-B175-S-15-220425	SP-B175-S-25-220425	SP-B175-S-38-220425	CL-B176-S-25-220502	CL-B176-S-45-220502	CL-B176-S-55-220503
Sample Collection Date		4/27/2022	4/27/2022	4/28/2022	4/25/2022	4/25/2022	4/25/2022	5/2/2022	5/2/2022	5/3/2022
Sample Depth (ft bgs)		10	48	58	15	25	38	25	45	55
Sample Type		N	N	N	N	N	N	N	N	N
Description	**Units**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Mean Grain Size Description USCS/ASTM	NA	Fine Sand	Medium Sand	Fine Sand	Fine Sand	Fine Sand	Fine Sand	Fine Sand	Fine Sand	Fine Sand
Gravel	wt. percent	0	29.75	5.85	0.33	0	0	0.12	0	1.52
Coarse Sand Size	wt. percent	0.81	19.34	0.68	0.43	0.39	0	0.18	0	1.52
Medium Sand Size	wt. percent	7.09	20.58	16.1	1.98	1.89	38.75	3.19	24.12	40.22
Fine Sand Size	wt. percent	89.64	27.83	61.52	92.23	93.2	60.65	79.25	71.44	57.42
Clay	wt. percent	0.71	1.06	0.1	1.67	1.08	0.13	1.62	0.66	0.01
Silt/Clay	wt. percent	2.46	2.5	15.85	5.03	4.52	0.6	17.26	4.43	0.66
Silt	wt. percent	1.75	1.44	15.75	3.36	3.44	0.47	15.63	3.77	0.65
Median Grain Size	mm	0.280	1.901	0.233	0.238	0.207	0.360	0.153	0.284	0.382
TOC	mg/kg	500 U	890 J	3,800	1,400 J	7,600	3,800	1,000 J	670 J	18,000
Dry Bulk Density	g/cc	1.62	1.80	1.6	1.65	1.68	1.42	1.24	1.71	0.85
Horizontal Effective Permeability to Water	millidarcy	632	641	1.35	581	591	0.519	3.52	655	0.363
Vertical Effective Permeability to Water	millidarcy	611	602	1.18	536	588	0.231	3.28	47.8	0.306
Horizontal Intrinsic Permeability to Water	cm^2	6.24E-09	6.33E-09	1.33E-11	5.74E-09	5.83E-09	5.12E-12	3.48E-11	6.47E-09	3.58E-12
Vertical Intrinsic Permeability to Water	cm^2	6.03E-09	5.94E-09	1.17E-11	5.29E-09	5.80E-09	2.28E-12	3.23E-11	4.72E-10	3.02E-12
Effective Porosity	%Vb	34.63	32.02	13.49	29.76	31.81	8.08	19.03	27.83	11.16
Total Porosity	%Vb	36.7	35.4	56.0	35.4	37.0	43.8	77.6	32.9	52.9
Horizontal Hydraulic Conductivity	cm/s	6.79E-04	6.76E-04	1.42E-06	6.18E-04	6.32E-04	5.49E-07	3.70E-06	6.89E-04	3.81E-07
Vertical Hydraulic Conductivity	cm/s	6.43E-04	6.35E-04	1.24E-06	5.69E-04	6.19E-04	2.45E-07	3.45E-06	5.03E-05	3.22E-07
Moisture Content	% wt	19.2	17.6	30.7	14	18.4	27.1	58.4	17.1	39.7
Volumetric Water Content	fraction Vb	0.347	0.261	0.387	0.238	0.317	0.457	0.215	0.31	0.35
Total Sample Volume	cc	141.07	141.07	246.07	141.07	224.86	141.07	212.15	141.07	212.15
USCS (field)	--	SP	SW	MH	SP	SP	MH/CH	MH/SP	SW	MH
Field Description		Fine to very fine sand	Fine to coarse sand	Sandy silt	Very fine to medium sand	Very fine sand	Silt to silty clay	Sandy silt to very fine sand	Medium to coarse sand	Sandy silt

Table D-12. Physical Properties of Soil – 2022 (continued)

Location Name		NP-B177			NP-B178			DG-B179			DB-B180
Sample Name		NP-B177-S-40-220505	NP-B177-S-65-220505	NP-B177-S-75-220505	NP-B178-S-30-220509	NP-B178-S-50-220509	NP-B178-S-58-220509	DG-B179-S-30-220712	DG-B179-S-45-220712	DG-B179-S-55-220712	DG-B180-S-70-220712
Sample Collection Date		5/5/2022	5/5/2022	5/5/2022	5/9/2022	5/9/2022	5/9/2022	7/12/2022	7/12/2022	7/12/2022	7/12/2022
Sample Depth (ft bgs)		40	65	75	30	50	58	30	45	55	70
Sample Type		N	N	N	N	N	N	N	N	N	N
Description	**Units**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Mean Grain Size Description USCS/ASTM	NA	Fine Sand	Fine Sand	Fine Sand	Fine Sand	Fine Sand	Coarse Sand	Gravel	Medium Sand	Medium Sand	Silt
Gravel	wt. percent	0	0	0	0	0	16.67	89.62	15.02	0.19	0
Coarse Sand Size	wt. percent	0.46	0.48	0.33	0.1	0.1	46.27	7.31	17.37	7.35	0
Medium Sand Size	wt. percent	26.44	8.28	37.96	1.26	1.26	31.19	0.85	32.93	55.23	0.16
Fine Sand Size	wt. percent	72.15	84.31	59.07	94.51	94.45	4.56	1.79	27.98	32.63	40.97
Clay	wt. percent	0.19	0.56	0.23	0.75	0.75	0.16	0.07	2.62	1.44	15.61
Silt/Clay	wt. percent	0.95	6.93	2.64	4.13	4.18	1.32	0.43	6.7	4.6	58.87
Silt	wt. percent	0.77	6.37	2.41	3.38	3.43	1.15	0.36	4.08	3.16	43.26
Median Grain Size	mm	0.316	0.212	0.38	0.196	0.196	2.495	11.525	0.796	0.541	0.060
TOC	mg/kg	100 J	1,400 J	110,000	110 J	540 J	99,000	250 J	1,700 J	1,100 J	26,000
Dry Bulk Density	g/cc	1.73	NA	1.03	1.61	1.95	1.17	1.99	1.98	1.78	1.63
Horizontal Effective Permeability to Water	millidarcy	564	NA	0.451	614	524	0.331	4875	3876	5493	0.322
Vertical Effective Permeability to Water	millidarcy	554	NA	0.416	566	505	0.296	4587	3654	5379	0.157
Horizontal Intrinsic Permeability to Water	cm^2	5.91E-04	NA	4.76E-07	6.58E-04	5.56E-04	3.48E-07	4.81E-08	3.83E-08	5.42E-08	3.18E-12
Vertical Intrinsic Permeability to Water	cm^2	5.90E-04	NA	4.41E-07	6.00E-04	5.35E-04	3.14E-07	4.53E-08	3.61E-08	5.31E-08	1.55E-12
Effective Porosity	%Vb	30.73	NA	13.42	32.43	18.2	11.82	N/A	N/A	N/A	N/A
Total Porosity	%Vb	33.5	NA	60.2	36.0	24.6	59.9	43.7	48.3	44.2	39.7
Horizontal Hydraulic Conductivity	cm/s	5.91E-04	NA	4.76E-07	6.58E-04	5.56E-04	3.48E-07	4.49E-03	3.63E-03	5.33E-03	3.03E-07
Vertical Hydraulic Conductivity	cm/s	5.90E-04	NA	4.41E-07	6.00E-04	5.35E-04	3.14E-07	4.23E-03	3.51E-03	5.13E-03	1.50E-07
Moisture Content	% wt	15.6	NA	55	19.3	7.7	44.5	2.4	9.9	13.6	22.3
Volumetric Water Content	fraction Vb	0.27	NA	0.568	0.312	0.15	0.519	0.048	0.196	0.242	0.365
Total Sample Volume	cc	141.9	NA	205.92	141.9	141.9	214.82	61.27	139.32	139.83	140.51
USCS (field)	--	MH	SP	MH	SP	SW	Pt/CL	GW	SP	SP/CL	CL
Field Description		Sandy silt	Very fine to medium sand	Sandy silt	Very fine to medium sand	Gravelly fine to very coarse sand	Peat to sandy clay	Silty sandy gravel	Fine sand	Fine sand/clay interface	Silty clay

Notes:

Table D-12. Physical Properties of Soil – 2022 (continued)

J - The reported value is an estimated concentration.
N – Sample is not part of a field duplicate pair
NA = not analyzed
U - The analyte was not detected at or above the limit of detection (LOD). (sometimes validators will elevate the limit due to the "B" qualifier using the 5x/10x rule so this definition is different than the lab description).
cc = cubic centimeter
cm^2 = squared centimeter
cm/s = centimeter per second
g/cc = grams per cubic centimeter
g/g = grams per gram
mg/kg = milligrams per kilogram
mm = millimeters
USCS - Unified Soil Classification System
Vb = bulk volume
wt. percent = percentage by weight
% wt = water percentage

Table D-13. Target VOCs in Grab Groundwater Samples – 2019

Location Name			SP-B90	SP-B90	SP-B90	SP-B91	SP-B92	SP-B92	SP-B93
Sample Name			SP-B090-GW-14-190628	SP-B090-GW-15-190628	SP-B090-GW-27-190628	SP-B91-GW-9-190626	SP-B92-GW-15-191016	SP-B92-GW-30-191016	SP-B93-GW-12.5-190626
Sample Collection Date			6/28/2019	6/28/2019	6/28/2019	6/26/2019	10/16/2019	10/16/2019	6/26/2019
Screen Interval (ft bgs)			10 - 15	10 - 15	23 - 27	5 - 9	10 - 15	25 - 30	7.5 - 12.5
Sample Type			FD	P	N	N	N	N	N
Analyte Name	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/L	0.48	0.3 U	0.3 U	0.3 U	0.3 U	0.3 UJ	0.3 UJ	0.3 U
Tetrachloroethene	µg/L	2.4	0.3 U	0.3 U	0.3 U	0.3 U	0.3 UJ	0.3 UJ	0.3 U
Cis-1,2-Dichloroethene	µg/L	16	0.3 U	0.3 U	0.3 U	0.3 U	0.3 UJ	0.3 UJ	**19,000**
Trans-1,2-Dichloroethene	µg/L	100	0.3 U	0.3 U	0.3 U	0.3 U	0.3 UJ	0.3 UJ	**240 J**
1,1,1-Trichloroethane	µg/L	200	0.3 U	0.3 U	0.3 U	0.3 U	0.3 UJ	0.3 UJ	0.3 U
Chloroethane	µg/L	7.7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.3 U
Vinyl Chloride	µg/L	0.02	**0.14**	**0.14**	0.015 U	0.015 U	**0.15**	**0.071**	**1,900**
1,1-Dichloroethane	µg/L	7.7	0.3 U	0.3 U	0.3 U	0.3 U	0.3 UJ	0.3 UJ	0.3 U
1,1-Dichloroethene	µg/L	7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ	**53**
Trichloroethene	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 UJ	0.3 UJ	**1,600**

Location Name			SP-B93	SP-B94	SP-B94	SP-B131	SP-B131	CL-B95	CL-B95
Sample Name			SP-B93-GW-40-190626	SP-B94-GW-20-190626	SP-B94-GW-39-190626	SP-B131-GW-15-191015	SP-B131-GW-40-191015	CL-B95-GW-13-190627	CL-B95-GW-33-190627
Sample Collection Date			6/26/2019	6/26/2019	6/26/2019	10/15/2019	10/15/2019	6/27/2019	6/27/2019
Screen Interval (ft bgs)			36 - 40	16 - 20	35 - 39	10 - 15	35 - 40	8 - 13	29 - 33
Sample Type			N	N	N	N	N	N	N
Analyte Name	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/L	0.48	0.3 U	0.3 U	0.3 U	0.3 UJ	0.3 UJ	0.3 U	0.3 U
Tetrachloroethene	µg/L	2.4	0.3 U	0.3 U	0.3 U	0.3 UJ	0.3 UJ	0.3 U	0.3 U
Cis-1,2-Dichloroethene	µg/L	16	**22**	**39**	1.1	**69 J**	3.6 J	**65 J**	1.3
Trans-1,2-Dichloroethene	µg/L	100	0.34 J	2.3	0.3 U	3.3 J	0.3 UJ	18 J	0.3 U
1,1,1-Trichloroethane	µg/L	200	0.3 U	0.3 U	0.3 U	0.3 UJ	0.3 UJ	0.3 U	0.3 U
Chloroethane	µg/L	7.7	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ	4.1 J	0.5 U
Vinyl Chloride	µg/L	0.02	**1**	**130**	**0.42**	**120**	**29 J**	**4,700 J**	**22**
1,1-Dichloroethane	µg/L	7.7	0.3 U	3.8	0.3 U	0.3 UJ	0.3 UJ	7 J	0.3 U
1,1-Dichloroethene	µg/L	7	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 U
Trichloroethene	µg/L	0.3	**1.7**	**3.6**	**0.41 J**	0.3 UJ	0.3 UJ	0.3 U	0.3 U

Table D-13. Target VOCs in Grab Groundwater Samples – 2019 (continued)

Location Name			CL-B96		CL-B96		CL-B98		CL-B98		CL-B99		CL-B99		CL-B100	
Sample Name			CL-B96-GW-15-190627		CL-B96-GW-40-190627		CL-B98-GW-15-191014		CL-B98-GW-37-191014		CL-B99-GW-15-190625		CL-B99-GW-26-190625		CL-B100-GW-15-190625	
Sample Collection Date			6/27/2019		6/27/2019		10/14/2019		10/14/2019		6/25/2019		6/25/2019		6/25/2019	
Screen Interval (ft bgs)			11 - 15		36 - 40		10 - 15		32 - 37		11 - 15		22 - 26		11 - 15	
Sample Type			N		N		N		N		N		N		N	
Analyte Name	**Units**	**PAL**	**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
1,2-Dichloroethane	µg/L	0.48	0.3	U	0.3	U	0.3	U	0.3	U	0.3	UJ	0.3	U	0.3	U
Tetrachloroethene	µg/L	2.4	0.3	U	0.3	U	0.3	U	0.3	U	0.3	UJ	0.3	U	0.3	U
Cis-1,2-Dichloroethene	µg/L	16	6.9		0.3	U	0.3	U	**310**		3.5	J	16		0.3	U
Trans-1,2-Dichloroethene	µg/L	100	1.2		0.3	U	0.3	U	100		0.3	UJ	3.2		0.3	U
1,1,1-Trichloroethane	µg/L	200	0.3	U	0.3	U	0.3	U	0.3	U	0.3	UJ	0.3	U	0.3	U
Chloroethane	µg/L	7.7	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U
Vinyl Chloride	µg/L	0.02	**20**		**0.03**		**0.31**		**250**		**3.3**	**J**	**17**		**0.22**	**J**
1,1-Dichloroethane	µg/L	7.7	0.92	J	0.3	U	0.3	U	0.3	U	0.3	UJ	0.3	U	0.3	U
1,1-Dichloroethene	µg/L	7	0.5	U	0.5	U	0.5	U	6.4		0.5	UJ	0.5	U	0.5	U
Trichloroethene	µg/L	0.3	**0.72**	**J**	0.3	U	0.3	U	**8**		0.3	UJ	**1.2**		0.3	U

Location Name			CL-B100	CL-B101	CL-B101	CL-B102	CL-B102	CL-B103	CL-B103
Sample Name			CL-B100-GW-39-190625	CL-B101-GW-10-190618	CL-B101-GW-35-190618	CL-B102-GW-13-190617	CL-B102-GW-35-190617	CL-B103-GW-09-190617	CL-B103-GW-40-190617
Sample Collection Date			6/25/2019	6/18/2019	6/18/2019	6/17/2019	6/17/2019	6/17/2019	6/17/2019
Screen Interval (ft bgs)			35 - 39	5 - 10	31 - 35	8 - 13	31 - 35	4 - 9	36 - 40
Sample Type			N	N	N	N	N	N	N
Analyte Name	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/L	0.48	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Tetrachloroethene	µg/L	2.4	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Cis-1,2-Dichloroethene	µg/L	16	2.6	0.3 U	**650 J**	**340 J**	**29**	12 J	0.3 U
Trans-1,2-Dichloroethene	µg/L	100	1.6	0.3 U	14 J	20	2	1 J	0.3 U
1,1,1-Trichloroethane	µg/L	200	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Chloroethane	µg/L	7.7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl Chloride	µg/L	0.02	**16**	**0.11**	**690 J**	**230 J**	**11**	**140 J**	**0.34**
1,1-Dichloroethane	µg/L	7.7	0.3 U	0.3 U	0.3 U	0.48 J	0.3 U	0.65 J	0.3 U
1,1-Dichloroethene	µg/L	7	0.5 U	0.5 U	5.4 J	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U

Table D-13. Target VOCs in Grab Groundwater Samples – 2019 (continued)

Location Name			CL-B104	CL-B104	CL-B105	CL-B105	CL-B106	CL-B106	CL-B107
Sample Name			CL-B104-GW-14-190618	CL-B104-GW-28-190618	CL-B105-GW-15-190612	CL-B105-GW-40-190612	CL-B106-GW-20-190610	CL-B106-GW-32-190610	CL-B107-GW-10-190611
Sample Collection Date			6/18/2019	6/18/2019	6/12/2019	6/12/2019	6/10/2019	6/10/2019	6/11/2019
Screen Interval (ft bgs)			9 - 14	24 - 28	10 - 15	36 - 40	15 - 20	28 - 32	5 - 10
Sample Type			N	N	N	N	N	N	N
Analyte Name	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/L	0.48	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Tetrachloroethene	µg/L	2.4	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Cis-1,2-Dichloroethene	µg/L	16	**310**	**97 J**	0.3 U	**370**	0.3 U	0.3 U	0.3 U
Trans-1,2-Dichloroethene	µg/L	100	9.3 J	64 J	1.2 J	3.1	0.3 U	0.3 U	0.3 U
1,1,1-Trichloroethane	µg/L	200	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Chloroethane	µg/L	7.7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl Chloride	µg/L	0.02	**790**	**570 J**	**14 J**	**64**	0.015 U	0.015 U	**0.69 J**
1,1-Dichloroethane	µg/L	7.7	0.42 J	2.2 J	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,1-Dichloroethene	µg/L	7	1.1 J	0.5 U	0.5 U	0.66 J	0.5 U	0.5 U	0.5 U
Trichloroethene	µg/L	0.3	0.3 U	**1.7 J**	0.3 U	**2.9**	0.3 U	0.3 U	0.3 U

Location Name			CL-B107	CL-B108	CL-B108	CL-B109	CL-B109	CL-B132	CL-B132
Sample Name			CL-B107-GW-32-190611	CL-B108-GW-12-190611	CL-B108-GW-25-190611	CL-B109-GW-15-190611	CL-B109-GW-37-190611	CL-B132-GW-15-190930	CL-B132-GW-45-190930
Sample Collection Date			6/11/2019	6/11/2019	6/11/2019	6/11/2019	6/11/2019	9/30/2019	9/30/2019
Screen Interval (ft bgs)			28 - 32	7 - 12	21 - 25	10 - 15	33 - 37	10 - 15	40 - 45
Sample Type			N	N	N	N	N	N	N
Analyte Name	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/L	0.48	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Tetrachloroethene	µg/L	2.4	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Cis-1,2-Dichloroethene	µg/L	16	0.3 U	0.3 U	0.3 U	2.4	0.3 U	**76**	0.3 U
Trans-1,2-Dichloroethene	µg/L	100	0.3 U	0.3 U	0.3 U	1	0.3 U	14	0.3 U
1,1,1-Trichloroethane	µg/L	200	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Chloroethane	µg/L	7.7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
Vinyl Chloride	µg/L	0.02	0.015 U	0.015 U	0.015 U	**0.26**	0.015 U	**3,700**	**0.45**
1,1-Dichloroethane	µg/L	7.7	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,1-Dichloroethene	µg/L	7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U

Table D-13. Target VOCs in Grab Groundwater Samples – 2019 (continued)

Location Name			CL-B134	CL-B134	NP-B110		NP-B110	NP-B111	NP-B111
Sample Name			CL-B134-GW-49-191003	CL-B134-GW-50-191003	NP-B110-GW-15-190612	QC-190612-02	NP-B110-GW-40-190612	NP-B111-GW-17-190612	NP-B111-GW-40-190612
Sample Collection Date			10/3/2019	10/3/2019	6/12/2019	6/12/2019	6/12/2019	6/12/2019	6/12/2019
Screen Interval (ft bgs)			45 - 50	45 - 50	10 - 15	10 - 15	36 - 40	12 - 17	36 - 40
Sample Type			FD	P	P	FD	N	N	N
Analyte Name	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/L	0.48	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Tetrachloroethene	µg/L	2.4	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Cis-1,2-Dichloroethene	µg/L	16	7.1	7.5	0.3 U	0.73 J	**190**	0.3 U	0.3 U
Trans-1,2-Dichloroethene	µg/L	100	0.3 U	0.3 U	0.3 U	0.3 U	3.6	0.76 J	0.3 U
1,1,1-Trichloroethane	µg/L	200	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Chloroethane	µg/L	7.7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl Chloride	µg/L	0.02	**0.33**	**0.34**	**0.93**	**0.89**	**21**	**0.28**	0.015 U
1,1-Dichloroethane	µg/L	7.7	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,1-Dichloroethene	µg/L	7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	µg/L	0.3	0.3 U	**0.51 J**	0.3 U	0.3 U	**9.4**	0.3 U	0.3 U

Location Name			NP-B112	NP-B112	NP-B113	NP-B114	NP-B114	NP-B115	NP-B115
Sample Name			NP-B112-GW-15-190614	NP-B112-GW-31-190614	NP-B113-GW-15-190613	NP-B114-GW-15-190613	NP-B114-GW-40-190613	NP-B115-GW-15-190614	NP-B115-GW-27-190614
Sample Collection Date			6/14/2019	6/14/2019	6/13/2019	6/13/2019	6/13/2019	6/14/2019	6/14/2019
Screen Interval (ft bgs)			10 - 15	27 - 31	10 - 15	10 - 15	35 - 40	10 - 15	23 - 27
Sample Type			N	N	N	N	N	N	N
Analyte Name	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/L	0.48	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Tetrachloroethene	µg/L	2.4	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Cis-1,2-Dichloroethene	µg/L	16	0.3 U	0.3 U	2.8	0.3 U	0.3 U	0.3 U	0.3 U
Trans-1,2-Dichloroethene	µg/L	100	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,1,1-Trichloroethane	µg/L	200	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Chloroethane	µg/L	7.7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl Chloride	µg/L	0.02	**0.036 J**	**0.17**	**0.089 J**	**0.64**	**0.27**	0.015 J	**0.17**
1,1-Dichloroethane	µg/L	7.7	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,1-Dichloroethene	µg/L	7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	**2**

Table D-13. Target VOCs in Grab Groundwater Samples – 2019 (continued)

Location Name			NP-B116	NP-B116	NP-B116	NP-B117s	NP-B117s	NP-B118	NP-B118
Sample Name			NP-B116-GW-14-190621	NP-B116-GW-15-190621	NP-B116-GW-36-190624	NP-B117s-GW-15-190613	NP-B117s-GW-40-190613	NP-B118-GW-20-190624	NP-B118-GW-35-190625
Sample Collection Date			6/21/2019	6/21/2019	6/24/2019	6/13/2019	6/13/2019	6/24/2019	6/25/2019
Screen Interval (ft bgs)			10 - 15	10 - 15	32 - 36	10 - 15	35 - 40	16 - 20	31 - 35
Sample Type			FD	P	N	N	N	N	N
Analyte Name	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/L	0.48	0.3 UJ	0.3 U	**0.76 J**	0.3 U	0.3 UJ	0.3 U	0.3 U
Tetrachloroethene	µg/L	2.4	0.3 UJ	0.3 U	0.3 U	0.3 U	0.3 UJ	0.3 U	0.3 U
Cis-1,2-Dichloroethene	µg/L	16	0.3 UJ	0.3 U	**2,000**	0.3 U	**4,300**	3.7	0.3 U
Trans-1,2-Dichloroethene	µg/L	100	0.3 UJ	0.3 U	27	0.3 U	45 J	0.3 U	0.3 U
1,1,1-Trichloroethane	µg/L	200	0.3 UJ	0.3 U	0.3 U	0.3 U	0.3 UJ	0.3 U	0.3 U
Chloroethane	µg/L	7.7	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U
Vinyl Chloride	µg/L	0.02	**0.1 J**	**0.12 J**	**280**	**0.034 J**	**830**	**0.61**	**0.033**
1,1-Dichloroethane	µg/L	7.7	0.3 UJ	0.3 U	**8.7**	0.3 U	7.3 J	0.3 U	0.3 U
1,1-Dichloroethene	µg/L	7	0.5 UJ	0.5 U	5.2	0.5 U	**9.3 J**	0.5 U	0.5 U
Trichloroethene	µg/L	0.3	0.3 UJ	0.3 U	**2**	0.3 U	**1.5 J**	0.3 U	0.3 U

Location Name			NP-B119	NP-B119	NP-B120	NP-B120	NP-B121	NP-B121	NP-B122
Sample Name			NP-B119-GW-15-190621	NP-B119-GW-32-190621	NP-B120-GW-15-190624	NP-B120-GW-50-190624	NP-B121-GW-15-190620	NP-B121-GW-35-190620	NP-B122-GW-15-190620
Sample Collection Date			6/21/2019	6/21/2019	6/24/2019	6/24/2019	6/20/2019	6/20/2019	6/20/2019
Screen Interval (ft bgs)			10 - 15	28 - 32	11 - 15	46 - 50	10 - 15	31 - 35	10 - 15
Sample Type			N	N	N	N	N	N	N
Analyte Name	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/L	0.48	0.3 U	0.3 U	0.3 U	**0.6 J**	0.3 U	0.3 U	0.3 U
Tetrachloroethene	µg/L	2.4	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Cis-1,2-Dichloroethene	µg/L	16	0.3 U	0.3 U	1	**1,400 J**	0.3 U	0.41 J	0.57 J
Trans-1,2-Dichloroethene	µg/L	100	0.3 U	0.3 U	0.3 U	46	0.3 U	0.3 U	0.3 U
1,1,1-Trichloroethane	µg/L	200	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Chloroethane	µg/L	7.7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl Chloride	µg/L	0.02	0.015 U	**0.024**	**0.43**	**240 J**	**0.087**	**0.24**	**0.12**
1,1-Dichloroethane	µg/L	7.7	0.3 U	0.3 U	0.3 U	3.6	0.3 U	0.3 U	0.3 U
1,1-Dichloroethene	µg/L	7	0.5 U	0.5 U	0.5 U	4.4	0.5 U	0.5 U	0.5 U
Trichloroethene	µg/L	0.3	0.3 U	0.3 U	0.3 U	**0.9 J**	0.3 U	**0.8 J**	0.3 U

Table D-13. Target VOCs in Grab Groundwater Samples – 2019 (continued)

Location Name			NP-B122	NP-B123	NP-B123	NP-B123	NP-B124	NP-B124
Sample Name			NP-B122-GW-28-190621	NP-B123-GW-19-190619	NP-B123-GW-20-190619	NP-B123-GW-40-190619	NP-B124-GW-20-190620	NP-B124-GW-29-190620
Sample Collection Date			6/21/2019	6/19/2019	6/19/2019	6/19/2019	6/20/2019	6/20/2019
Screen Interval (ft bgs)			24 - 28	15 - 20	15 - 20	36 - 40	15 - 20	25 - 29
Sample Type			N	P	FD	N	N	N
Analyte Name	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/L	0.48	0.3 U	0.3 U	0.3 UJ	0.3 U	0.3 U	0.3 U
Tetrachloroethene	µg/L	2.4	0.3 U	0.3 U	0.3 UJ	0.3 U	0.3 U	0.3 U
Cis-1,2-Dichloroethene	µg/L	16	0.3 U	0.3 U	0.3 UJ	0.3 U	0.3 U	0.3 U
Trans-1,2-Dichloroethene	µg/L	100	0.3 U	0.3 U	0.3 UJ	0.3 U	0.3 U	0.3 U
1,1,1-Trichloroethane	µg/L	200	0.3 U	0.3 U	0.3 UJ	0.3 U	0.3 U	0.3 U
Chloroethane	µg/L	7.7	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
Vinyl Chloride	µg/L	0.02	**0.13**	**0.052**	**0.066**	**0.14**	**0.14**	**0.12**
1,1-Dichloroethane	µg/L	7.7	0.3 U	0.3 U	0.3 UJ	0.3 U	0.3 U	0.3 U
1,1-Dichloroethene	µg/L	7	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
Trichloroethene	µg/L	0.3	0.3 U	0.3 U	0.3 UJ	0.3 U	0.3 U	0.3 U

Location Name			NP-B125	NP-B125
Sample Name			NP-B125-GW-23-190619	NP-B125-GW-39-190619
Sample Collection Date			6/19/2019	6/19/2019
Screen Interval (ft bgs)			18 - 23	35 - 39
Sample Type			N	N
Analyte Name	**Units**	**PAL**	**Result**	**Result**
1,2-Dichloroethane	µg/L	0.48	0.3 U	0.3 U
Tetrachloroethene	µg/L	2.4	0.3 U	0.3 U
Cis-1,2-Dichloroethene	µg/L	16	0.3 U	0.3 U
Trans-1,2-Dichloroethene	µg/L	100	0.3 U	0.3 U
1,1,1-Trichloroethane	µg/L	200	0.3 U	0.3 U
Chloroethane	µg/L	7.7	0.5 U	0.5 U
Vinyl Chloride	µg/L	0.02	**0.023**	**0.1**
1,1-Dichloroethane	µg/L	7.7	0.3 U	0.3 U
1,1-Dichloroethene	µg/L	7	0.5 U	0.5 U
Trichloroethene	µg/L	0.3	0.3 U	0.3 U

Notes:

Table D-13. Target VOCs in Grab Groundwater Samples – 2019 (continued)

Samples analyzed using EPA Method 8260C
FD - Field Duplicate
J - The reported value is an estimated concentration.
N – Sample is not part pof a field duplicate pair
P – Parent sample of field duplicate
PAL - Project Action Limit
U - The analyte was not detected at or above the stated limit. (sometimes validators will elevate the limit due to the "B" qualifier using the 5x/10x rule so this definition is different than the lab description).
UJ - The analyte was not detected at or above the sample quantitation limit, which is an estimated value.
Underlined values represent analytes not detected at or above the stated limit, which exceeds the PAL.
Bolded values indicate that the reported concentration exceeds the PAL.
µg/L - micrograms per liter

Table D-14. TPH in Grab Groundwater Samples - 2019

Location Name	Sample Name	Sample Collection Date	Screened Interval (ft bgs)	Sample Type	PAL (µg/L)	TPH-Diesel range C12-C24 (µg/L)
NP-B118	NP-B118-GW-20-190624	6/24/2019	16 - 20	N	500	310
	NP-B118-GW-35-190625	6/25/2019	31 - 35	N	500	50 U
NP-B119	NP-B119-GW-15-190621	6/21/2019	10 - 15	N	500	410
	NP-B119-GW-32-190621	6/21/2019	28 - 32	N	500	**1,200 J**
NP-B120	NP-B120-GW-15-190624	6/24/2019	11 - 15	N	500	320
	NP-B120-GW-50-190624	6/24/2019	46 - 50	N	500	210
NP-B121	NP-B121-GW-15-190620	6/20/2019	10 - 15	N	500	260
	NP-B121-GW-35-190620	6/20/2019	31 - 35	N	500	150
NP-B122	NP-B122-GW-15-190620	6/20/2019	10 - 15	N	500	**920**
	NP-B122-GW-28-190621	6/21/2019	24 - 28	N	500	50 U
NP-B123	NP-B123-GW-19-190619	6/19/2019	15 - 19	P	500	300 U
	NP-B123-GW-20-190619	6/19/2019	15 - 19	FD	500	390 U
	NP-B123-GW-40-190619	6/19/2019	36 - 40	N	500	210 U
NP-B124	NP-B124-GW-20-190620	6/20/2019	15 - 20	N	500	260
	NP-B124-GW-29-190620	6/20/2019	25 - 29	N	500	50 U
NP-B125	NP-B125-GW-23-190619	6/19/2019	18 - 23	N	500	260 U
	NP-B125-GW-39-190619	6/19/2019	35 - 39	N	500	50 U

Notes:
Samples analyzed using EPA Method NWTPH-Dx
FD - Field Duplicate
J - The reported value is an estimated concentration.
N – Sample is not part of a duplicate pair.
P – Parent sample of field duplicate
PAL - Project Action Limit
U - The analyte was analyzed but not detected at or above the stated limit. (sometimes validators will elevate the limit due to the "B" qualifier using the 5x/10x rule so this definition is different than the lab description).
Bolded values indicate that the reported concentration exceeds the PAL.
µg/L - micrograms per liter

Table D-15. PCB Aroclors in Grab Groundwater Samples - 2019

		Location Name	NP-B118	NP-B118	NP-B119	NP-B119	NP-B120	NP-B120	NP-B121
		Sample Name	NP-B118-GW-20-190624	NP-B118-GW-35-190625	NP-B119-GW-15-190621	NP-B119-GW-32-190621	NP-B120-GW-15-190624	NP-B120-GW-50-190624	NP-B121-GW-15-190620
		Sample Collection Date	6/24/2019	6/25/2019	6/21/2019	6/21/2019	6/24/2019	6/24/2019	6/20/2019
		Screened Interval (ft bgs)	16 - 20	31 - 35	10 - 15	28 - 32	11 - 15	46 - 50	10 - 15
		Sample type	N	N	N	N	N	N	N
Analyte Name	**Units**	**PAL (µg/L)**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
AROCLOR-1016	µg/L	0.003	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 UJ
AROCLOR-1221	µg/L	NE	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 UJ
AROCLOR-1232	µg/L	NE	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 UJ
AROCLOR-1242	µg/L	NE	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 UJ
AROCLOR-1248	µg/L	NE	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 UJ
AROCLOR-1254	µg/L	0.0001	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 UJ
AROCLOR-1260	µg/L	0.0001	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 UJ
AROCLOR-1262	µg/L	NE	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 UJ
AROCLOR-1268	µg/L	NE	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 UJ
Total PCB Aroclors	µg/L	0.000007	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 UJ

		Location Name	NP-B121	NP-B122	NP-B122	NP-B123	NP-B123	NP-B123	NP-B124
		Sample Name	NP-B121-GW-35-190620	NP-B122-GW-15-190620	NP-B122-GW-28-190621	NP-B123-GW-19-190619	NP-B123-GW-20-190619	NP-B123-GW-40-190619	NP-B124-GW-20-190620
		Sample Collection Date	6/20/2019	6/20/2019	6/21/2019	6/19/2019	6/19/2019	6/19/2019	6/20/2019
		Screened Interval (ft bgs)	31 - 35	10 - 15	24 - 28	15 - 19	15 - 19	36 - 40	15 - 20
		Sample type	N	N	N	P	FD	N	N
Analyte Name	**Units**	**PAL (µg/L)**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
AROCLOR-1016	µg/L	0.003	0.008 U	0.008 U	0.008 U	0.008 UJ	0.008 UJ	0.008 U	0.008 UJ
AROCLOR-1221	µg/L	NE	0.008 U	0.008 U	0.008 U	0.008 UJ	0.008 UJ	0.008 U	0.008 UJ
AROCLOR-1232	µg/L	NE	0.008 U	0.008 U	0.008 U	0.008 UJ	0.008 UJ	0.008 U	0.008 UJ
AROCLOR-1242	µg/L	NE	0.008 U	0.008 U	0.008 U	0.008 UJ	0.008 UJ	0.008 U	0.008 UJ
AROCLOR-1248	µg/L	NE	0.008 U	0.008 U	0.008 U	0.008 UJ	0.008 UJ	0.008 U	0.008 UJ
AROCLOR-1254	µg/L	0.0001	0.008 U	0.008 U	0.008 U	0.008 UJ	0.008 UJ	0.008 U	0.008 UJ
AROCLOR-1260	µg/L	0.0001	0.008 U	0.008 U	0.008 U	0.008 UJ	0.008 UJ	0.008 U	0.008 UJ
AROCLOR-1262	µg/L	NE	0.008 U	0.008 U	0.008 U	0.008 UJ	0.008 UJ	0.008 U	0.008 UJ
AROCLOR-1268	µg/L	NE	0.008 U	0.008 U	0.008 U	0.008 UJ	0.008 UJ	0.008 U	0.008 UJ
Total PCB Aroclors	µg/L	0.000007	0.008 U	0.008 U	0.008 U	0.008 UJ	0.008 UJ	0.008 U	0.008 UJ

Table D-15. PCB Aroclors in Grab Groundwater Samples – 2019 (continued)

		Location Name	NP-B124	NP-B125	NP-B125
		Sample Name	NP-B124-GW-29-190620	NP-B125-GW-23-190619	NP-B125-GW-39-190619
		Sample Collection Date	6/20/2019	6/19/2019	6/19/2019
		Screened Interval (ft bgs)	25 - 29	18 - 23	35 - 39
		Sample type	N	N	N
Analyte Name	**Units**	**PAL (µg/L)**	**Result**	**Result**	**Result**
AROCLOR-1016	µg/L	0.003	0.008 U	0.008 UJ	0.008 UJ
AROCLOR-1221	µg/L	NE	0.008 U	0.008 UJ	0.008 UJ
AROCLOR-1232	µg/L	NE	0.008 U	0.008 UJ	0.008 UJ
AROCLOR-1242	µg/L	NE	0.008 U	0.008 UJ	0.008 UJ
AROCLOR-1248	µg/L	NE	0.008 U	0.008 UJ	0.008 UJ
AROCLOR-1254	µg/L	0.0001	0.008 U	0.008 UJ	0.008 UJ
AROCLOR-1260	µg/L	0.0001	0.008 U	0.008 UJ	0.008 UJ
AROCLOR-1262	µg/L	NE	0.008 U	0.008 UJ	0.008 UJ
AROCLOR-1268	µg/L	NE	0.008 U	0.008 UJ	0.008 UJ
Total PCB Aroclors	µg/L	0.000007	0.008 U	0.008 UJ	0.008 UJ

Notes:
Samples analyzed using EPA Method 8082 A
FD - Field Duplicate
J - The result is an estimated concentration that is less than
the LOQ, but greater than or equal to the DL.
N – Sample is not part of a duplicate pair.
P – Parent sample of field duplicate
PAL - Project Action Limit
U - The compound was analyzed for, but was not detected ("nondetect") at or above the LOD.
UJ - The analyte was not detected at the stated sample quantitation limit, which is an estimated value
Underlined values represent analytes not detected at or above the stated limit, which exceeds the PAL.
Bolded values indicate that the reported concentration exceeds the PAL.
µg/L -micrograms per liter

Table D-16. 1,4-Dioxane in Grab Groundwater Samples - 2019

Location Name	Sample Name	Sample Collection Date	Screened Interval (ft bgs)	Sample Type	PAL (µg/L)	1,4-Dioxane (µg/L)
CL-B102	CL-B102-GW-13-190617	6/17/2019	8 - 13	N	0.44	**5**
	CL-B102-GW-35-190617	6/17/2019	31 - 35	N	0.44	0.6U
CL-B103	CL-B103-GW-09-190617	6/17/2019	4 - 9	N	0.44	**4.2**
	CL-B103-GW-40-190617	6/17/2019	36 - 40	N	0.44	0.6U
CL-B105	CL-B105-GW-15-190612	6/12/2019	10 - 15	N	0.44	**42**
	CL-B105-GW-40-190612	6/12/2019	36 - 40	N	0.44	**3.6**
CL-B106	CL-B106-GW-20-190610	6/10/2019	15 - 20	N	0.44	0.6U
	CL-B106-GW-32-190610	6/10/2019	28 - 32	N	0.44	0.6U
CL-B107	CL-B107-GW-10-190611	6/11/2019	5 - 10	N	0.44	0.6U
	CL-B107-GW-32-190611	6/11/2019	28 - 32	N	0.44	0.6U
CL-B108	CL-B108-GW-12-190611	6/11/2019	7 - 12	N	0.44	0.6U
	CL-B108-GW-25-190611	6/11/2019	21 - 25	N	0.44	0.6U
CL-B109	CL-B109-GW-15-190611	6/11/2019	10 - 15	N	0.44	**4.4**
	CL-B109-GW-37-190611	6/11/2019	33 - 37	N	0.44	0.6U
CL-B134	CL-B134-GW-49-191003	10/3/2019	45 - 50	FD	0.44	0.6U
	CL-B134-GW-50-191003	10/3/2019	45 - 50	P	0.44	0.6U
NP-B110	NP-B110-GW-15-190612	6/12/2019	10 - 15	P	0.44	**28**
	QC-190612-02	6/12/2019	10 - 15	FD	0.44	**27**
	NP-B110-GW-40-190612	6/12/2019	36 - 40	N	0.44	0.6U
NP-B111	NP-B111-GW-17-190612	6/12/2019	12 - 17	N	0.44	**7**
	NP-B111-GW-40-190612	6/12/2019	36 - 40	N	0.44	0.6U
NP-B112	NP-B112-GW-15-190614	6/14/2019	10 - 15	N	0.44	0.6U
	NP-B112-GW-31-190614	6/14/2019	27 - 31	N	0.44	0.6U
NP-B113	NP-B113-GW-15-190613	6/13/2019	10 - 15	N	0.44	**70**
NP-B114	NP-B114-GW-15-190613	6/13/2019	10 - 15	N	0.44	**24**
	NP-B114-GW-40-190613	6/13/2019	35 - 40	N	0.44	**1.4**
NP-B115	NP-B115-GW-15-190614	6/14/2019	10 - 15	N	0.44	0.6U
	NP-B115-GW-27-190614	6/14/2019	23 - 27	N	0.44	0.6U
NP-B116	NP-B116-GW-14-190621	6/21/2019	10 - 15	FD	0.44	**3.2**
	NP-B116-GW-15-190621	6/21/2019	10 - 15	P	0.44	**3.5**
	NP-B116-GW-36-190624	6/24/2019	32 - 36	N	0.44	**50**
NP-B117s	NP-B117S-GW-15-190613	6/13/2019	10 - 15	N	0.44	**10**
	NP-B117S-GW-40-190613	6/13/2019	35 - 40	N	0.44	**73**
NP-B118	NP-B118-GW-20-190624	6/24/2019	16 - 20	N	0.44	**0.98J**
	NP-B118-GW-35-190625	6/25/2019	31 - 35	N	0.44	0.6U

Table D-16. 1,4-Dioxane in Grab Groundwater Samples – 2019 (continued)

Location Name	Sample Name	Sample Collection Date	Screened Interval (ft bgs)	Sample Type	PAL (µg/L)	1,4-Dioxane (µg/L)
NP-B119	NP-B119-GW-15-190621	6/21/2019	10 - 15	N	0.44	0.6U
	NP-B119-GW-32-190621	6/21/2019	28 - 32	N	0.44	0.6U
NP-B120	NP-B120-GW-15-190624	6/24/2019	11 - 15	N	0.44	**16**
	NP-B120-GW-50-190624	6/24/2019	46 - 50	N	0.44	**30**
NP-B121	NP-B121-GW-15-190620	6/20/2019	10 - 15	N	0.44	0.6U
	NP-B121-GW-35-190620	6/20/2019	31 - 35	N	0.44	0.6U
NP-B122	NP-B122-GW-15-190620	6/20/2019	10 - 15	N	0.44	0.6U
	NP-B122-GW-28-190621	6/21/2019	24 - 28	N	0.44	0.6U
NP-B123	NP-B123-GW-19-190619	6/19/2019	15 - 19	P	0.44	0.6U
	NP-B123-GW-20-190619	6/19/2019	15 - 19	FD	0.44	0.6U
	NP-B123-GW-40-190619	6/19/2019	36 - 40	N	0.44	0.6U
NP-B124	NP-B124-GW-20-190620	6/20/2019	15 - 20	N	0.44	0.6U
	NP-B124-GW-29-190620	6/20/2019	25 - 29	N	0.44	0.6U
NP-B125	NP-B125-GW-23-190619	6/19/2019	18 - 23	N	0.44	0.6U
	NP-B125-GW-39-190619	6/19/2019	35 - 39	N	0.44	0.6U

Notes:
Samples analyzed using EPA Method 8270D.
FD - Field Duplicate
J - The reported value is an estimated concentration.
N – Sample is not part of a field duplicate pair
P – Parent sample of field duplicate
PAL - Project Action Limit
U - The analyte was not detected at or above the stated limit. (sometimes validators will elevate the limit due to the "B" qualifier
using the 5x/10x rule so this definition is different than the lab description).
Underlined values represent analytes not detected at or above the stated limit, which exceeds the PAL.
Bolded values indicate that the reported concentration exceeds the PAL.
µg/L – micrograms per liter

Table D-17. Target VOCs in Groundwater Monitoring Wells - 2019 and 2022

Location Name			MW1-42	MW1-43	MW1-44	MW1-45	MW1-46		MW1-47
Sample Name			MW1-42-191022	MW1-43-191023	MW1-44-191024	MW1-45-191022	MW1-46-191025	FD-191025-01	MW1-47-191025
Sample Collection Date			10/22/2019	10/23/2019	10/24/2019	10/22/2019	10/25/2019	10/25/2019	10/25/2019
Screened Interval (ft bgs)			15 - 25	15 - 25	18 - 28	15 - 25	24 - 34	24 - 34	15 - 25
Sample Type			N	N	N	N	P	FD	N
Analyte Name	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/L	0.48	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Tetrachloroethene	µg/L	2.4	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Cis-1,2-Dichloroethene	µg/L	16	12	**610 J**	**3,900 J**	**470 J**	**4,700 J**	**4,500 J**	**1,800 J**
Trans-1,2-Dichloroethene	µg/L	100	19	95	25	0.83 J	55	61	25
1,1,1-Trichloroethane	µg/L	200	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Chloroethane	µg/L	7.7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	4.8	0.5 U
Vinyl Chloride	µg/L	0.02	**27**	**340 J**	**470 J**	**160**	**1,100 J**	**1,100 J**	**620 J**
1,1-Dichloroethane	µg/L	7.7	6.2	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,1-Dichloroethene	µg/L	7	0.5 U	3.1	**32**	3.2	**11**	**13**	4.6
Trichloroethene	µg/L	0.3	**1.3**	6 UJ	15 UJ	0.3 UJ	15 UJ	**56 J**	6 UJ

Location Name			MW1-48	MW1-49		MW1-50	MW1-51	MW1-52	MW1-53
Sample Name			MW1-48-191028	MW1-49-191022	FD-191022-01	MW1-50-191023	MW1-51-191021	MW1-52-191021	MW1-53-191023
Sample Collection Date			10/28/2019	10/22/2019	10/22/2019	10/23/2019	10/21/2019	10/21/2019	10/23/2019
Screened Interval (ft bgs)			15 - 25	5 - 15	5 - 15	5 - 15	10 - 20	7 - 17	5 - 15
Sample Type			N	P	FD	N	N	N	N
Analyte Name	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/L	0.48	0.3 U	0.3 U	0.3 U	0.3 R	0.3 U	0.3 U	0.3 U
Tetrachloroethene	µg/L	2.4	0.3 U	0.3 U	0.3 U	0.3 R	0.3 U	0.3 U	0.3 U
Cis-1,2-Dichloroethene	µg/L	16	0.3 U	**1,300 J**	**1,300 J**	**400 J**	**26**	**510 J**	**760 J**
Trans-1,2-Dichloroethene	µg/L	100	0.3 U	19	21	4.3 J	0.3 U	5.5	43
1,1,1-Trichloroethane	µg/L	200	0.3 U	0.3 U	0.3 U	0.3 R	0.3 U	0.3 U	0.3 U
Chloroethane	µg/L	7.7	0.5 U	1.8 J	0.59 J	0.5 R	0.5 U	0.5 U	0.5 U
Vinyl Chloride	µg/L	0.02	**0.28 J**	**100 J**	**84 J**	**27 J**	**33**	**120**	**220 J**
1,1-Dichloroethane	µg/L	7.7	0.3 U	0.3 U	0.3 U	0.3 R	0.3 U	0.3 U	0.3 U
1,1-Dichloroethene	µg/L	7	0.5 U	**8.8**	**9.1**	0.59 J	0.5 U	1.7	4.2
Trichloroethene	µg/L	0.3	0.3 U	**940 J**	**990 J**	**420 J**	0.3 U	0.3 U	**130 J**

Location Name	MW1-54	MW1-55	MW1-56	MW1-56	MW1-57	MW1-57	MW1-57

Table D-17. Target VOCs in Groundwater Monitoring Wells - 2019 and 2022 (continued)

Sample Name			MW1-54-191021	MW1-55-191024	MW1-56-12-191023	MW1-56-24-191023	MW1-57-10-191022	MW1-57-16-191022	MW1-57-32-191022
Sample Collection Date			10/21/2019	10/24/2019	10/23/2019	10/23/2019	10/22/2019	10/22/2019	10/22/2019
Screened Interval (ft bgs)			29 - 39	26.5 - 36.5	8 - 12	20 - 24	6 - 10.5	12 - 16	26 - 31
Sample Type			N	N	N	N	N	N	N
Analyte Name	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/L	0.48	0.3 U	0.3 U	0.3 U	0.3 UJ	150 U	0.3 U	0.3 U
Tetrachloroethene	µg/L	2.4	0.3 U	0.3 U	**19**	**110 J**	150 U	**55 J**	1.6
Cis-1,2-Dichloroethene	µg/L	16	0.3 UJ	**130 J**	**200,000 J**	**71,000 J**	**260,000 J**	**130,000 J**	**1,800 J**
Trans-1,2-Dichloroethene	µg/L	100	0.3 U	3.7	**2,900**	**1,200**	**2,000**	**3,000 J**	46
1,1,1-Trichloroethane	µg/L	200	0.3 U	0.3	0.3 U	0.3 UJ	150 U	0 U	0 U
Chloroethane	µg/L	7.7	0.5 U	0.5	0.5 U	0.5 UJ	250 U	0.5 U	0.5 U
Vinyl Chloride	µg/L	0.02	0.015 U	**24 J**	**890 J**	**72 J**	**8,700**	**200 J**	**230 J**
1,1-Dichloroethane	µg/L	7.7	0.3 U	0.3 U	0.3 U	0.3 UJ	150 U	0.3 U	0.3 U
1,1-Dichloroethene	µg/L	7	0.5 U	1.7	**78 J**	**43 J**	250 U	**74 J**	3.6
Trichloroethene	µg/L	0.3	0.3 UJ	**3.1**	**170,000 J**	**590,000 J**	**250,000 J**	**230,000 J**	**4,600 J**

Location Name			MW1-58	MW1-58	MW1-58	MW1-59	MW1-60	MW1-61	MW1-62
Sample Name			MW1-58-9-191024	MW1-58-19-191024	MW1-58-39.5-191024	MW1-59-191023	MW1-60-191023	MW1-61-191028	MW1-62-191024
Sample Collection Date			10/24/2019	10/24/2019	10/24/2019	10/23/2019	10/23/2019	10/28/2019	10/24/2019
Screened Interval (ft bgs)			5 - 9	15 - 19	31 - 35	60 - 70	15 - 25	3 - 13	31 - 41
Sample Type			N	N	N	N	N	N	N
Analyte Name	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/L	0.48	30 U	0.3 U	0.3 UJ	0.3 U	0.3 U	0.3 U	0.3 U
Tetrachloroethene	µg/L	2.4	30 U	0.3 U	0.3 UJ	0.3 U	0.3 U	0.3 U	0.3 U
Cis-1,2-Dichloroethene	µg/L	16	**6,900**	3.1	2.1 J	0.3 U	0.3 UJ	13	**1,200 J**
Trans-1,2-Dichloroethene	µg/L	100	**140**	3.3	0.15 J	0.3 U	0.3 U	0.89 J	27
1,1,1-Trichloroethane	µg/L	200	30 U	0.3 U	0.3 UJ	0.3 U	0.3 U	0.3 U	0.3 U
Chloroethane	µg/L	7.7	50 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl Chloride	µg/L	0.02	**19,000 J**	**9.1**	**5.2 J**	0.015 U	0.015 U	**61**	**300 J**
1,1-Dichloroethane	µg/L	7.7	30 U	0.3 U	0.3 UJ	0.3 U	0.3 U	0.3 U	0.3 U
1,1-Dichloroethene	µg/L	7	50 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	3.9
Trichloroethene	µg/L	0.3	**370**	0.3 U	0.3 UJ	0.3 U	0.3 UJ	0.3 U	**34 J**

Location Name	MW1-63	MW1-64	MW1-65	MW1-66	MW1-67	MW1-68	MW1-69
Sample Name	MW1-63-191025	MW1-64-191024	MW1-65-191021	MW1-66-191024	MW1-67-191028	MW1-68-191028	MW1-69-220511
Sample Collection Date	10/25/2019	10/24/2019	10/21/2019	10/24/2019	10/28/2019	10/28/2019	5/11/2022

Table D-17. Target VOCs in Groundwater Monitoring Wells - 2019 and 2022 (continued)

Screened Interval (ft bgs)			30 - 40	45 - 55	53 - 63	5 - 20	5 - 15	37 - 47	42 - 52
Sample Type			N	N	N	N	N	N	N
Analyte Name	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/L	0.48	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.15 U
Tetrachloroethene	µg/L	2.4	0.3 U	0.3 U	0.3 U	**42 J**	0.3 U	0.3 U	0.25 U
Cis-1,2-Dichloroethene	µg/L	16	**4,200 J**	**2,200 J**	**350 J**	**96,000 J**	0.3 U	3.4	7.1
Trans-1,2-Dichloroethene	µg/L	100	53	52	9.1	**1,500 J**	0.3 U	0.3 U	0.14 J
1,1,1-Trichloroethane	µg/L	200	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.07 U
Chloroethane	µg/L	7.7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.25 U
Vinyl Chloride	µg/L	0.02	**570 J**	**390 J**	**58**	**2,200 J**	**0.05**	**0.062**	**0.76**
1,1-Dichloroethane	µg/L	7.7	**10**	4.9	0.3 U	0.3 U	0.3 U	0.3 U	0.07 U
1,1-Dichloroethene	µg/L	7	**12**	**7.8**	1.4	**73 J**	0.5 U	0.5 U	0.07 U
Trichloroethene	µg/L	0.3	**20 J**	15 UJ	**1.3**	**280,000 J**	**35**	**35**	**1.9**

Location Name			MW1-70	MW1-71	MW1-72		MW1-73	MW1-74	MW1-75
Sample Name			MW1-70-220502	MW1-71-220512	MW1-72-220512	FD-220512-02	MW1-73-220513	MW1-74-220718	MW1-75-220718
Sample Collection Date			5/2/2022	5/12/2022	5/12/2022	5/12/2022	5/13/2022	7/18/2022	7/18/2022
Screened Interval (ft bgs)			70 - 80	95 - 100	60 - 70	60 - 70	90 - 100	45 - 55	75 - 80
Sample Type			N	N	P	FD	N	N	N
Analyte Name	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/L	0.48	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
Tetrachloroethene	µg/L	2.4	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Cis-1,2-Dichloroethene	µg/L	16	14	0.15 U	0.15 U	0.47	0.15 U	0.15 U	0.15 U
Trans-1,2-Dichloroethene	µg/L	100	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U
1,1,1-Trichloroethane	µg/L	200	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U
Chloroethane	µg/L	7.7	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Vinyl Chloride	µg/L	0.02	**0.99**	0.015 U	**0.14**	0.015 U	0.015 U	0.015 U	0.015 U
1,1-Dichloroethane	µg/L	7.7	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U
1,1-Dichloroethene	µg/L	7	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U
Trichloroethene	µg/L	0.3	**41**	0.15 U	0.15 U	0.15 U	0.094 J	0.15 U	0.15 U

Notes:
Samples analyzed using EPA Method 8260C
FD - Field Duplicate
J - The reported value is an estimated concentration.
N – Sample is not part pof a field duplicate pair
P – Parent sample of field duplicate

Table D-17. Target VOCs in Groundwater Monitoring Wells - 2019 and 2022 (continued)

PAL - Project Action Limit
R - The reported value is unusable, rejected.
U - The analyte was not detected at or above the stated limit. (sometimes validators will elevate the limit due to the "B" qualifier using the 5x/10x rule so this definition is different than the lab description).
UJ - The analyte was not detected at or above the sample quantitation limit, which is an estimated value.
Underlined values represent analytes not detected at or above the stated limit, which exceeds the PAL.
Bolded values indicate that the reported concentration exceeds the PAL.
µg/L - micrograms per liter

Table D-18. TPH in Groundwater Monitoring Wells - 2019

Location Name	Sample Name	Sample Collection Date	Screened Interval (ft bgs)	Sample Type	PAL (µg/L)	TPH-Diesel range C12-C24 (µg/L)
MW1-42	MW1-42-191022	10/22/2019	15 - 25	N	500	96
MW1-43	MW1-43-191023	10/23/2019	15 - 25	N	500	110
MW1-44	MW1-44-191024	10/24/2019	18 - 28	N	500	48 J
MW1-45	MW1-45-191022	10/22/2019	15 - 25	N	500	44 J
MW1-46	MW1-46-191025	10/25/2019	24 - 34	P	500	110
	FD-191025-01	10/25/2019	24 - 34	FD	500	120
MW1-47	MW1-47-191025	10/25/2019	15 - 25	N	500	**690**
MW1-48	MW1-48-191028	10/28/2019	15 - 25	N	500	**780**
MW1-62	MW1-62-191024	10/24/2019	31 - 41	N	500	350
MW1-63	MW1-63-191025	10/25/2019	30 - 40	N	500	220
MW1-64	MW1-64-191024	10/24/2019	45 - 55	N	500	270
MW1-65	MW1-65-191021	10/21/2019	53 - 63	N	500	48 J
MW1-67	MW1-67-191028	10/28/2019	5 - 15	N	500	**780**

Notes:
Samples analyzed using EPA Method NWTPH-Dx
FD - Field Duplicate
J - The reported value is an estimated concentration.
N – Sample is not part of a duplicate pair.
P – Parent sample of field duplicate
PAL - Project Action Limit
Bolded values indicate that the reported concentration exceeds the PAL.
µg/L - micrograms per liter

Table D-19. PCB Congeners in Groundwater Monitoring Wells - 2019 and 2022

Location Name			MW1-2		MW1-18	MW1-64	MW1-65	MW1-67	MW1-69	MW1-70	MW1-71	MW1-72		MW1-73	MW1-74	MW1-75
Sample Name			MW1-2-191029	FD-191029-01	MW1-18-191021	MW1-64-191024	MW1-65-191021	MW1-67-191028	MW1-69-220511	MW1-70-220502	MW1-71-220512	MW1-72-220512	FD-220512-02	MW1-73-220513	MW1-74-2200718	MW1-75-220718
Sample Collection Date			10/29/2019	10/29/2019	10/21/2019	10/24/2019	10/21/2019	10/28/2019	5/11/2022	5/2/2022	5/12/2022	5/12/2022	5/12/2022	5/13/2022	7/18/2022	7/18/2022
Screened Interval (ft bgs)			12.5 - 17.5	12.5 - 17.5	12 - 17	45 - 55	53 - 63	5 - 15	42 - 52	70 - 80	95 - 100	60 - 70	60 - 70	90 - 100	45 - 55	75 - 80
Sample Type			P	FD	N	N	N	N	N	N	N	P	FD	N	N	N
Analyte	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
PCB-001	pg/L	NA	9.5 U	9.5 U	9.5 U	8.1 J	11 J	520	69 U	**4.8 J**	700 U	68 U	68 U	68 U	67 U	69 U
PCB-002	pg/L	NA	19 U	19 U	1.8 J	19 U	19 U	38 J	49 U	**1.6 J**	500 U	49 U	48 U	49 U	48 U	49 U
PCB-003	pg/L	NA	9.5 U	9.5 U	0.9 J	9.5 U	1.7 J	77 J	39 U	**5 J**	400 U	39 U	39 U	39 U	38 U	39 U
PCB-004	pg/L	NA	24 U	24 U	24 U	26 J	24 U	1,900	**130**	48 U	**300 J**	43 U	43 U	43 U	42 U	43 U
PCB-005	pg/L	NA	24 U	24 U	24 U	24 U	24 U	49 J	39 U	19 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-006	pg/L	NA	24 U	24 U	24 U	24 U	24 U	410	**21 J**	19 U	**550**	35 U	35 U	35 U	34 U	35 U
PCB-007	pg/L	NA	24 U	24 U	24 U	24 U	24 U	51 J	34 U	19 U	350 U	34 U	34 U	34 U	33 U	34 U
PCB-008	pg/L	NA	24 U	24 U	24 U	11 J	24 U	710	**61**	**61 J**	**200 J**	32 U	32 U	32 U	32 U	32 U
PCB-009	pg/L	NA	47 U	48 U	47 U	48 U	48 U	81 J	34 U	29 U	350 U	34 U	34 U	34 U	33 U	34 U
PCB-010	pg/L	NA	47 U	48 U	47 U	48 U	48 U	110 J	43 U	29 U	440 U	43 U	43 U	43 U	42 U	43 U
PCB-011	pg/L	NA	24 U	24 U	24 U	16 U	24 U	24 U	270 U	**110 J**	2,800 U	270 U	270 U	270 U	260 U	270 U
PCB-012 AND 013	pg/L	NA	38 U	38 U	38 U	38 U	39 U	37 J	69 U	96 U	700 U	68 U	68 U	68 U	67 U	69 U
PCB-014	pg/L	NA	24 U	24 U	24 U	24 U	24 U	24 U	39 U	19 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-015	pg/L	NA	19 U	19 U	19 U	19 U	19 U	110 J	39 U	19 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-016	pg/L	NA	47 U	48 U	47 U	9.3 J	5.7 J	230	**44**	**38 J**	**240 J**	29 U	29 U	29 U	29 U	30 U
PCB-017	pg/L	NA	9.5 U	9.5 U	9.5 U	11 J	5.1 J	270	**38 J**	**38 J**	**420**	29 U	29 U	29 U	29 U	30 U
PCB-018 AND 030	pg/L		-- --	-- --	-- --	-- --	-- --	-- --	**76 J**	**71 J**	**5,400**	49 U	48 U	49 U	48 U	49 U
PCB-019	pg/L	NA	9.5 U	9.5 U	9.5 U	6.8 J	3.5 J	200	**34 J**	**11 J**	**310 J**	29 U	29 U	29 U	29 U	30 U
PCB-020 AND 028	pg/L		-- --	-- --	-- --	-- --	-- --	-- --	**43 J**	**110 J**	**470 J**	58 U	58 U	58 U	57 U	59 U
PCB-021 AND 033	pg/L	NA	38 U	38 U	38 U	5.3 J	3.7 J	90 J	59 U	**73 J**	600 U	58 U	58 U	58 U	57 U	59 U
PCB-022	pg/L	NA	9.5 U	9.5 U	9.5 U	3.4 J	1.6 J	76 J	**14 J**	**39 J**	300 U	29 U	29 U	29 U	29 U	30 U
PCB-023	pg/L	NA	19 U	19 U	19 U	19 U	19 U	19 U	30 U	19 U	300 U	29 U	29 U	29 U	29 U	30 U
PCB-024	pg/L	NA	19 U	19 U	19 U	19 U	19 U	7.5 J	34 U	19 U	350 U	34 U	34 U	34 U	33 U	34 U
PCB-025	pg/L	NA	19 U	19 U	19 U	19 U	19 U	90 J	30 U	**8.1 J**	**760**	29 U	29 U	29 U	29 U	30 U
PCB-026 AND 029	pg/L	NA	38 U	38 U	38 U	3.5 J	1.8 J	230 J	71 U	**20 J**	**3,200**	70 U	70 U	70 U	69 U	71 U
PCB-027	pg/L	NA	19 U	19 U	19 U	2.6 J	19 U	64 J	25 U	**6.7 J**	**380 J**	24 U	24 U	24 U	24 U	25 U
PCB-028 AND 020	pg/L	NA	38 U	38 U	3 J	12 U	7 J	280 J	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
PCB-030 AND 018	pg/L	NA	47 U	48 U	2.2 J	20 J	11 J	530	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
PCB-031	pg/L	NA	19 U	19 U	19 U	12 U	19 U	310	**43**	**150 J**	**770**	29 U	29 U	29 U	29 U	30 U
PCB-032	pg/L	NA	9.5 U	9.5 U	9.5 U	5.9 J	3.3 J	130 J	**33 J**	**25 J**	**330 J**	19 U	19 U	19 U	19 U	20 U
PCB-034	pg/L	NA	19 U	19 U	19 U	19 U	19 U	19 U	34 U	19 U	350 U	34 U	34 U	34 U	33 U	34 U
PCB-035	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	38 U	**3.1 J**	390 U	38 U	38 U	38 U	37 U	38 U
PCB-036	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	30 U	19 U	300 U	29 U	29 U	29 U	29 U	30 U
PCB-037	pg/L	NA	9.5 U	9.5 U	9.5 U	2.4 J	1.4 J	23 J	20 U	**29 J**	200 U	19 U	19 U	19 U	19 U	20 U
PCB-038	pg/L	NA	19 U	19 U	19 U	19 U	19 U	19 U	34 U	19 U	350 U	34 U	34 U	34 U	33 U	34 U
PCB-039	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	35 U	29 U	360 U	35 U	35 U	35 U	34 U	35 U
PCB-040 AND 071	pg/L	NA	19 U	19 U	19 U	3.1 J	2.8 J	84 J	59 U	**61 J**	**2,000**	58 U	58 U	58 U	57 U	59 U
PCB-041	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	39 U	**12 J**	400 U	39 U	39 U	39 U	38 U	39 U
PCB-042	pg/L	NA	19 U	19 U	19 U	2.5 J	3.7 J	77 J	39 U	**34 J**	**910**	39 U	39 U	39 U	38 U	39 U
PCB-043	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.9 J	39 U	**5.4 J**	**210 J**	39 U	39 U	39 U	38 U	39 U
PCB-044 AND 047 AND 065	pg/L	NA	71 U	71 U	71 U	14 U	72 U	370 J	**54 J**	**290 J**	**4,100**	**44 J**	**49 J**	**97 J**	**67 J**	**37 J**
PCB-045	pg/L	NA	19 U	19 U	19 U	2 J	1.2 J	61 J	39 U	**22 J**	400 U	39 U	39 U	39 U	38 U	39 U
PCB-046	pg/L	NA	19 U	19 U	19 U	19 U	19 U	31 J	39 U	**8.6 J**	**710 J**	39 U	39 U	39 U	38 U	39 U
PCB-048	pg/L	NA	19 U	19 U	19 U	19 U	1.1 J	25 J	30 U	**26 J**	**150 J**	29 U	29 U	29 U	29 U	30 U
PCB-049 AND 069	pg/L		-- --	-- --	-- --	-- --	-- --	-- --	69 U	**110 J**	**4,000**	68 U	68 U	68 U	67 U	69 U
PCB-050 AND 053	pg/L	NA	38 U	38 U	0.69 J	1.9 J	1.3 J	66 J	200 U	**27 J**	**2,900 J**	190 U	190 U	190 U	190 U	200 U
PCB-051	pg/L	NA	19 U	0.76 J	1.6 J	2.3 J	1 J	18 J	**17 J**	**67 J**	**350 J**	**25 J**	**25 J**	**55 J**	**63 J**	**28 J**
PCB-052	pg/L	NA	19 U	19 U	19 U	13 J	39 J	700	**33 J**	**420**	**9,500**	**13 J**	**13 J**	39 U	38 U	39 U
PCB-054	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	2.8 J	39 U	29 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-055	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	39 U	19 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-056	pg/L	NA	19 U	19 U	0.54 J	1.3 J	2 J	30 J	39 U	**65 J**	**570 J**	39 U	39 U	39 U	38 U	39 U

Table D-19. PCB Congeners in Groundwater Monitoring Wells - 2019 and 2022

Location Name			MW1-2		MW1-18	MW1-64	MW1-65	MW1-67	MW1-69	MW1-70	MW1-71	MW1-72		MW1-73	MW1-74	MW1-75
Sample Name			MW1-2-191029	FD-191029-01	MW1-18-191021	MW1-64-191024	MW1-65-191021	MW1-67-191028	MW1-69-220511	MW1-70-220502	MW1-71-220512	MW1-72-220512	FD-220512-02	MW1-73-220513	MW1-74-2200718	MW1-75-220718
Sample Collection Date			10/29/2019	10/29/2019	10/21/2019	10/24/2019	10/21/2019	10/28/2019	5/11/2022	5/2/2022	5/12/2022	5/12/2022	5/12/2022	5/13/2022	7/18/2022	7/18/2022
Screened Interval (ft bgs)			12.5 - 17.5	12.5 - 17.5	12 - 17	45 - 55	53 - 63	5 - 15	42 - 52	70 - 80	95 - 100	60 - 70	60 - 70	90 - 100	45 - 55	75 - 80
Sample Type			P	FD	N	N	N	N	N	N	N	P	FD	N	N	N
Analyte	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
PCB-057	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	2.3 J	39 U	19 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-058	pg/L	NA	19 U	19 U	19 U	19 U	19 U	19 U	39 U	19 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-059 AND 062 AND 075	pg/L	NA	57 U	57 U	57 U	57 U	58 U	27 J	99 U	**11 J**	1,000 U	97 U	97 U	97 U	96 U	98 U
PCB-060	pg/L	NA	19 U	19 U	19 U	19 U	19 U	9.8 J	30 U	**37 J**	**120 J**	29 U	29 U	29 U	29 U	30 U
PCB-061 AND 070 AND 074 AND 076	pg/L	NA	38 U	38 U	38 U	7.2 U	15 J	220 J	120 U	**400 J**	**6,200**	120 U	120 U	120 U	110 U	120 U
PCB-063	pg/L	NA	19 U	19 U	19 U	19 U	19 U	7.4 J	39 U	**5.2 J**	400 U	39 U	39 U	39 U	38 U	39 U
PCB-064	pg/L	NA	19 U	19 U	0.78 J	3.3 U	3.7 J	82 J	**13 J**	**83 J**	**1,200**	39 U	39 U	39 U	38 U	39 U
PCB-066	pg/L	NA	9.5 U	9.5 U	1.5 J	3.1 U	9 J	120 J	**15 J**	**130 J**	**2,900**	39 U	39 U	39 U	38 U	39 U
PCB-067	pg/L	NA	19 U	19 U	19 U	19 U	19 U	6.3 J	39 U	19 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-068	pg/L	NA	19 U	19 U	19 U	19 U	19 U	4 J	**29 J**	**46 J**	**180 J**	**37 J**	**41 J**	**63 J**	**66 J**	**27 J**
PCB-069 AND 049	pg/L	NA	38 U	38 U	1.9 J	5.8 J	18 J	310 J	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
PCB-072	pg/L	NA	19 U	19 U	19 U	19 U	19 U	5.5 J	30 U	19 U	**210 J**	29 U	29 U	29 U	29 U	30 U
PCB-073	pg/L	NA	19 U	19 U	19 U	19 U	19 U	19 U	39 U	19 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-077	pg/L	NA	9.5 U	9.5 U	1.2 J	9.5 U	9.6 U	3.3 J	39 U	**13 J**	400 U	39 U	39 U	39 U	38 U	39 U
PCB-078	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	39 U	19 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-079	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	39 U	**13 J**	400 U	39 U	39 U	39 U	38 U	39 U
PCB-080	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	39 U	29 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-081	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	39 U	19 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-082	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	1.4 J	15 J	39 U	**52 J**	**1,100 J**	39 U	39 U	39 U	38 U	39 U
PCB-083	pg/L	NA	19 U	19 U	19 U	19 U	3.3 J	22 J	39 U	**25 J**	**840**	39 U	39 U	39 U	38 U	39 U
PCB-084	pg/L	NA	3.3 J	3.5 J	19 U	3.4 J	7.5 J	120 J	59 U	**150 J**	**3,600**	58 U	58 U	58 U	57 U	59 U
PCB-085 AND 116 AND 117	pg/L	NA	-- --	-- --	-- --	-- --	-- --	-- --	130 U	**77 J**	**1,900 J**	130 U	130 U	130 U	120 U	130 U
PCB-086 AND 087 AND 097 AND 109 AND 119 AND 125	pg/L	NA	-- --	-- --	-- --	-- --	-- --	-- --	300 U	**340 J**	**7,600**	290 U	290 U	290 U	290 U	300 U
PCB-088	pg/L	NA	-- --	-- --	-- --	-- --	-- --	-- --	39 U	-- --	400 U	39 U	39 U	39 U	38 U	39 U
PCB-088 AND 091	pg/L	NA	19 U	19 UJ	1.2 J	1.2 J	3 J	61 J	-- --	**68 J**	-- --	-- --	-- --	-- --	-- --	-- --
PCB-089	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	39 U	29 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-090 AND 101 AND 113	pg/L	NA	-- --	-- --	-- --	-- --	-- --	-- --	120 U	**470 J**	**13,000**	120 U	120 U	120 U	110 U	120 U
PCB-091	pg/L	NA	-- --	-- --	-- --	-- --	-- --	-- --	39 U	-- --	**1,800**	39 U	39 U	39 U	38 U	39 U
PCB-092	pg/L	NA	9.5 U	9.5 U	9.5 U	1.8 J	5.1 J	66 J	39 U	**78 J**	**2,600**	39 U	39 U	39 U	38 U	39 U
PCB-093 AND 100	pg/L	NA	19 U	19 U	19 U	19 U	19 U	19 U	79 U	38 U	800 U	78 U	78 U	78 U	77 U	79 U
PCB-094	pg/L	NA	19 U	19 U	19 U	19 U	19 U	19 U	39 U	29 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-095	pg/L	NA	19 U	19 U	5.2 J	9.6 U	23 J	390	**15 J**	**400**	**10,000**	**12 J**	39 U	39 U	38 U	39 U
PCB-096	pg/L	NA	19 U	19 U	19 U	19 U	19 U	2.9 J	39 U	**2.5 J**	400 U	39 U	39 U	39 U	38 U	39 U
PCB-098 AND 102	pg/L	NA	19 U	19 U	19 U	19 U	19 U	9.8 J	99 U	**8.8 J**	**430 J**	97 U	97 U	97 U	96 U	98 U
PCB-099	pg/L	NA	19 U	19 U	19 U	3.9 U	10 J	110 J	39 U	**170 J**	**6,800**	39 U	39 U	39 U	38 U	39 U
PCB-103	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	39 U	29 U	**140 J**	39 U	39 U	39 U	38 U	39 U
PCB-104	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	39 U	29 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-105	pg/L	NA	19 U	19 U	19 U	1.6 U	19 U	35	39 U	**160**	**3,300 J**	39 U	39 U	39 U	38 U	39 U
PCB-106	pg/L	NA	19 U	19 U	19 U	19 U	19 U	19 U	39 U	19 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-107	pg/L	NA	-- --	-- --	-- --	-- --	-- --	-- --	39 U	-- --	**1,000**	39 U	39 U	39 U	38 U	39 U
PCB-107 AND 124	pg/L	NA	19 U	19 U	19 U	19 U	19 U	19 U	-- --	**16 J**	-- --	-- --	-- --	-- --	-- --	-- --
PCB-108 AND 119 AND 086 AND 097 AND 125 AND 087	pg/L	NA	57 U	57 U	57 U	5.9 U	58 U	140 J	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
PCB-108 AND 124	pg/L	NA	-- --	-- --	-- --	-- --	-- --	-- --	79 U	-- --	**330 J**	78 U	78 U	78 U	77 U	79 U
PCB-109	pg/L	NA	1 J	9.5 U	9.5 U	9.5 U	1.5 J	13 J	-- --	**24 J**	-- --	-- --	-- --	-- --	-- --	-- --
PCB-110 AND 115	pg/L	NA	19 U	19 U	19 U	9.3 U	20 J	270 J	99 U	**520**	**16,000**	97 U	97 U	97 U	96 U	98 U
PCB-111	pg/L	NA	19 U	19 U	19 U	19 U	19 U	19 U	39 U	19 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-112	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	39 U	19 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-113 AND 090 AND 101	pg/L	NA	28 U	29 U	28 U	8.1 U	22 J	270 J	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
PCB-114	pg/L	NA	9.5 U	9.5 U	1 J	9.5 U	9.6 U	9.5 U	39 U	**9.1 J**	**260 J**	39 U	39 U	39 U	38 U	39 U
PCB-117 AND 116 AND 085	pg/L	NA	57 U	57 U	57 U	1.2 J	58 U	24 J	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --

Table D-19. PCB Congeners in Groundwater Monitoring Wells - 2019 and 2022

Location Name			MW1-2		MW1-18	MW1-64	MW1-65	MW1-67	MW1-69	MW1-70	MW1-71	MW1-72		MW1-73	MW1-74	MW1-75
Sample Name			MW1-2-191029	FD-191029-01	MW1-18-191021	MW1-64-191024	MW1-65-191021	MW1-67-191028	MW1-69-220511	MW1-70-220502	MW1-71-220512	MW1-72-220512	FD-220512-02	MW1-73-220513	MW1-74-2200718	MW1-75-220718
Sample Collection Date			10/29/2019	10/29/2019	10/21/2019	10/24/2019	10/21/2019	10/28/2019	5/11/2022	5/2/2022	5/12/2022	5/12/2022	5/12/2022	5/13/2022	7/18/2022	7/18/2022
Screened Interval (ft bgs)			12.5 - 17.5	12.5 - 17.5	12 - 17	45 - 55	53 - 63	5 - 15	42 - 52	70 - 80	95 - 100	60 - 70	60 - 70	90 - 100	45 - 55	75 - 80
Sample Type			P	FD	N	N	N	N	N	N	N	P	FD	N	N	N
Analyte	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
PCB-118	pg/L	NA	9.5 U	9.5 U	9.5 U	8.4 U	17 U	170	39 U	**350**	**11,000 J**	39 U	39 U	39 U	38 U	39 U
PCB-120	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	39 U	19 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-121	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	39 U	19 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-122	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	39 U	19 U	**150 J**	39 U	39 U	39 U	38 U	39 U
PCB-123	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	69 U	**4.9 J**	700 U	68 U	68 U	68 U	67 U	69 U
PCB-126	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	69 U	19 U	700 U	68 U	68 U	68 U	67 U	69 U
PCB-127	pg/L	NA	19 U	19 U	19 U	19 U	19 U	19 U	20 U	19 U	200 U	19 U	19 U	19 U	19 U	20 U
PCB-128 AND 166	pg/L	NA	1.9 J	2.1 J	2.4 J	1.4 U	0.96 J	15 J	69 U	**45 J**	**1,900**	68 U	68 U	68 U	67 U	69 U
PCB-129 AND 138 AND 163	pg/L		-- --	-- --	-- --	-- --	-- --	-- --	110 U	**260 J**	**9,900**	110 U	110 U	110 U	110 U	110 U
PCB-130	pg/L	NA	9.5 U	9.5 U	1.1 J	9.5 U	9.6 U	5.3 J	39 U	**18 J**	**770 J**	39 U	39 U	39 U	38 U	39 U
PCB-131	pg/L	NA	19 U	19 U	19 U	19 U	19 U	19 U	39 U	**4.3 J**	**160 J**	39 U	39 U	39 U	38 U	39 U
PCB-132	pg/L	NA	19 U	19 U	3.4 J	2 U	3.5 J	35 J	39 U	**92 J**	**4,100**	39 U	39 U	39 U	38 U	39 U
PCB-133	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	39 U	**2.5 J**	**140 J**	39 U	39 U	39 U	38 U	39 U
PCB-134	pg/L	NA	-- --	-- --	-- --	-- --	-- --	-- --	39 U	-- --	400 U	39 U	39 U	39 U	38 U	39 U
PCB-134 AND 143	pg/L	NA	38 U	38 U	38 U	38 U	0.64 J	7.4 J	-- --	38 U	-- --	-- --	-- --	-- --	-- --	-- --
PCB-135 AND 151	pg/L	NA	-- --	-- --	-- --	-- --	-- --	-- --	99 U	**59 J**	**2,100**	97 U	97 U	97 U	96 U	98 U
PCB-136	pg/L	NA	9.5 U	9.5 U	0.6 J	1.2 J	1.1 J	18 J	39 U	**29 J**	**1,100**	39 U	39 U	39 U	38 U	39 U
PCB-137	pg/L	NA	19 U	19 U	0.5 J	19 U	19 U	4.6 J	39 U	**16 J**	**720 J**	39 U	39 U	39 U	38 U	39 U
PCB-138 AND 163 AND 129	pg/L	NA	57 U	57 U	57 U	7.8 U	7.7 U	87 J	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
PCB-139 AND 140	pg/L	NA	19 U	19 U	19 U	19 U	19 U	2 J	69 U	**4.7 J**	**240 J**	68 U	68 U	68 U	67 U	69 U
PCB-141	pg/L	NA	9.5 U	9.5 U	1.4 J	1.3 U	0.72 J	11 J	20 U	**45 J**	**1,400**	19 U	19 U	19 U	19 U	20 U
PCB-142	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	30 U	19 U	300 U	29 U	29 U	29 U	29 U	30 U
PCB-143	pg/L	NA	-- --	-- --	-- --	-- --	-- --	-- --	39 U	-- --	**600 J**	39 U	39 U	39 U	38 U	39 U
PCB-144	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	4.3 J	49 U	**9.1 J**	**280 J**	49 U	48 U	49 U	48 U	49 U
PCB-145	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	49 U	9.6 U	500 U	49 U	48 U	49 U	48 U	49 U
PCB-146	pg/L	NA	19 U	19 UJ	1.6 J	0.72 U	1 J	13 J	39 U	**23 J**	**1,200**	39 U	39 U	39 U	38 U	39 U
PCB-147 AND 149	pg/L	NA	38 U	38 U	38 U	4.7 U	39 U	79 J	79 U	**160 J**	**6,600**	78 U	78 U	78 U	77 U	79 U
PCB-148	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	39 U	19 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-150	pg/L	NA	19 U	19 U	19 U	19 U	19 U	19 U	39 U	19 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-151 AND 135	pg/L	NA	38 U	38 UJ	38 U	1.8 U	39 U	31 J	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
PCB-152	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	39 U	9.6 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-153 AND 168	pg/L	NA	38 U	38 U	38 U	5.3 U	39 U	68 J	79 U	**150 J**	**6,400**	78 U	78 U	78 U	77 U	79 U
PCB-154	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	99 U	19 U	1,000 U	97 U	97 U	97 U	96 U	98 U
PCB-155	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	39 U	29 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-156 AND 157	pg/L	NA	19 U	19 UJ	19 U	1.2 U	19 U	19 U	79 U	**53 J**	**1,500 J**	78 U	78 U	78 U	77 U	79 U
PCB-158	pg/L	NA	19 U	19 U	1 J	0.72 U	0.88 J	8.7 J	39 U	**29 J**	**930**	39 U	39 U	39 U	38 U	39 U
PCB-159	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	49 U	**1.2 J**	500 U	49 U	48 U	49 U	48 U	49 U
PCB-160	pg/L	NA	19 U	19 U	19 U	19 U	19 U	19 U	39 U	19 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-161	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	39 U	19 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-162	pg/L	NA	19 U	19 U	19 U	19 U	19 U	19 U	30 U	**1.1 J**	300 U	29 U	29 U	29 U	29 U	30 U
PCB-164	pg/L	NA	19 U	19 U	19 U	19 U	19 U	5.6 J	20 U	**19 J**	**700 J**	19 U	19 U	19 U	19 U	20 U
PCB-165	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	39 U	19 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-167	pg/L	NA	9.5 U	9.5 U	1.3 J	0.44 U	0.7 J	4.1 J	39 U	**16 J**	**430 J**	39 U	39 U	39 U	38 U	39 U
PCB-169	pg/L	NA	9.5 U	9.5 U	1.4 J	9.5 U	0.42 J	9.5 U	39 U	19 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-170	pg/L	NA	19 U	19 U	19 U	1.7 U	19 UJ	8.2 J	39 U	**53 J**	**910**	39 U	39 U	39 U	38 U	39 U
PCB-171 AND 173	pg/L	NA	19 U	0.69 J	19 U	19 U	19 U	2.2 J	49 U	**15 J**	**280 J**	49 U	48 U	49 U	48 U	49 U
PCB-172	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	30 U	**7.6 J**	**130 J**	29 U	29 U	29 U	29 U	30 U
PCB-174	pg/L	NA	19 U	19 U	19 U	1.2 U	19 U	7.1 J	39 U	**48 J**	**540 J**	39 U	39 U	39 U	38 U	39 U
PCB-175	pg/L	NA	19 U	19 U	19 U	19 U	19 U	19 U	39 U	**0.77 J**	400 U	39 U	39 U	39 U	38 U	39 U
PCB-176	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	1.1 J	20 U	**4.4 J**	**99 J**	19 U	19 U	19 U	19 U	20 U

Table D-19. PCB Congeners in Groundwater Monitoring Wells - 2019 and 2022

Location Name			MW1-2		MW1-18	MW1-64	MW1-65	MW1-67	MW1-69	MW1-70	MW1-71	MW1-72		MW1-73	MW1-74	MW1-75
Sample Name			MW1-2-191029	FD-191029-01	MW1-18-191021	MW1-64-191024	MW1-65-191021	MW1-67-191028	MW1-69-220511	MW1-70-220502	MW1-71-220512	MW1-72-220512	FD-220512-02	MW1-73-220513	MW1-74-2200718	MW1-75-220718
Sample Collection Date			10/29/2019	10/29/2019	10/21/2019	10/24/2019	10/21/2019	10/28/2019	5/11/2022	5/2/2022	5/12/2022	5/12/2022	5/12/2022	5/13/2022	7/18/2022	7/18/2022
Screened Interval (ft bgs)			12.5 - 17.5	12.5 - 17.5	12 - 17	45 - 55	53 - 63	5 - 15	42 - 52	70 - 80	95 - 100	60 - 70	60 - 70	90 - 100	45 - 55	75 - 80
Sample Type			P	FD	N	N	N	N	N	N	N	P	FD	N	N	N
Analyte	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
PCB-177	pg/L	NA	19 U	0.72 J	1.1 J	19 U	19 U	4 J	30 U	**23 J**	**370 J**	29 U	29 U	29 U	29 U	30 U
PCB-178	pg/L	NA	9.5 U	9.5 U	9.5 U	0.39 U	9.6 U	9.5 U	59 U	**5.2 J**	600 U	58 U	58 U	58 U	57 U	59 U
PCB-179	pg/L	NA	19 U	0.52 J	0.57 J	0.25 U	19 U	2.8 J	30 U	**12 J**	**170 J**	29 U	29 U	29 U	29 U	30 U
PCB-180 AND 193	pg/L	NA	38 U	38 U	38 U	2.9 U	39 U	14 J	69 U	**100 J**	**1,200 J**	68 U	68 U	68 U	67 U	69 U
PCB-181	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	30 U	19 U	300 U	29 U	29 U	29 U	29 U	30 U
PCB-182	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	39 U	19 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-183	pg/L	NA	19 U	19 U	19 U	1.5 U	19 U	19 U	-- --	**23 J**	-- --	-- --	-- --	-- --	-- --	-- --
PCB-183 AND 185	pg/L	NA	-- --	-- --	-- --	-- --	-- --	-- --	79 U	-- --	**400 J**	78 U	78 U	78 U	77 U	79 U
PCB-184	pg/L	NA	19 U	19 U	19 U	19 U	19 U	19 U	39 U	19 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-185	pg/L	NA	19 U	19 U	0.31 J	0.32 U	19 U	0.67 J	-- --	**4.9 J**	-- --	-- --	-- --	-- --	-- --	-- --
PCB-186	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	39 U	19 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-187	pg/L	NA	19 U	19 U	1.4 J	1.1 U	1.1 J	7.5 J	39 U	**28 J**	**470 J**	39 U	39 U	39 U	38 U	39 U
PCB-188	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	180 U	29 U	1,800 U	180 U	170 U	180 U	170 U	180 U
PCB-189	pg/L	NA	9.5 U	9.5 U	1.1 J	9.5 U	9.6 U	9.5 U	39 U	**2.6 J**	400 U	39 U	39 U	39 U	38 U	39 U
PCB-190	pg/L	NA	19 U	19 U	19 U	19 U	19 U	1.3 J	39 U	**7.9 J**	**160 J**	39 U	39 U	39 U	38 U	39 U
PCB-191	pg/L	NA	19 U	19 U	19 U	19 U	19 U	19 U	30 U	**2.1 J**	300 U	29 U	29 U	29 U	29 U	30 U
PCB-192	pg/L	NA	19 U	19 U	19 U	19 U	19 U	19 U	30 U	9.6 U	300 U	29 U	29 U	29 U	29 U	30 U
PCB-194	pg/L	NA	19 U	19 U	19 U	1.5 U	19 U	2.7 J	39 U	**22 J**	400 U	39 U	39 U	39 U	38 U	39 U
PCB-195	pg/L	NA	19 U	19 U	0.29 J	19 U	0.3 J	0.73 J	49 U	**7.1 J**	500 U	49 U	49 U	49 U	48 U	49 U
PCB-196	pg/L	NA	19 U	19 U	0.4 J	0.59 U	19 U	1.7 J	39 U	**9.5 J**	400 U	39 U	39 U	39 U	38 U	39 U
PCB-197	pg/L	NA	19 U	19 U	19 U	19 U	19 U	19 U	-- --	**0.43 J**	-- --	-- --	-- --	-- --	-- --	-- --
PCB-197 AND 200	pg/L	NA	-- --	-- --	-- --	-- --	-- --	-- --	49 U	-- --	500 U	49 U	48 U	49 U	48 U	49 U
PCB-198 AND 199	pg/L	NA	19 U	19 U	19 U	1.5 U	0.42 J	3 J	49 U	**18 J**	500 U	49 U	48 U	49 U	48 U	49 U
PCB-200	pg/L	NA	19 U	19 U	19 U	19 U	19 U	0.64 J	-- --	**2.4 J**	-- --	-- --	-- --	-- --	-- --	-- --
PCB-201	pg/L	NA	19 U	19 U	19 U	19 U	19 U	0.72 J	190 U	**3 J**	1,900 U	190 U	180 U	180 U	180 U	190 U
PCB-202	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	30 U	**5 J**	300 U	29 U	29 U	29 U	29 U	30 U
PCB-203	pg/L	NA	19 U	0.28 J	0.59 J	0.82 U	19 U	1.6 J	49 U	**12 J**	500 U	49 U	48 U	49 U	48 U	49 U
PCB-204	pg/L	NA	19 U	19 U	19 U	19 U	19 U	19 U	39 U	19 U	400 U	39 U	39 U	39 U	38 U	39 U
PCB-205	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	20 U	**0.87 J**	200 U	19 U	19 U	19 U	19 U	20 U
PCB-206	pg/L	NA	9.5 U	9.5 U	9.5 U	4.3 U	9.6 U	2.3 J	20 U	**8.8 J**	200 U	19 U	19 U	19 U	19 U	20 U
PCB-207	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	39 U	**5.6 J**	400 U	39 U	39 U	39 U	38 U	39 U
PCB-208	pg/L	NA	9.5 U	9.5 U	9.5 U	9.5 U	9.6 U	9.5 U	110 U	**2.4 J**	1,100 U	110 U	110 U	110 U	110 U	110 U
PCB-209	pg/L	NA	19 UJ	19 U	19 U	5.7 U	19 U	19 U	740 U	**2.5 J**	7,500 U	730 U	730 U	730 U	720 U	740 U
Total Monochlorobiphenyls	pg/L	NA	-- --	-- --	-- --	-- --	-- --	-- --	39 U	-- --	400 U	39 U	39 U	39 U	38 U	39 U
Total Dichlorobiphenyls	pg/L	NA	-- --	-- --	-- --	-- --	-- --	-- --	**210 J**	-- --	**1,100 J**	31 U	31 U	31 U	31 U	31 U
Total Trichlorobiphenyls	pg/L	NA	-- --	-- --	-- --	-- --	-- --	-- --	**330 J**	-- --	**12,000 J**	19 U	19 U	19 U	19 U	20 U
Total Tetrachlorobiphenyls	pg/L	NA	-- --	-- --	-- --	-- --	-- --	-- --	**160 J**	-- --	**36,000 J**	**120 J**	**130 J**	**220 J**	**200 J**	**92 J**
Total Pentachlorobiphenyls	pg/L	NA	-- --	-- --	-- --	-- --	-- --	-- --	**15 J**	-- --	**82,000 J**	**12 J**	19 U	19 U	19 U	20 U
Total Hexachlorobiphenyls	pg/L	NA	-- --	-- --	-- --	-- --	-- --	-- --	20 U	-- --	**41,000 J**	19 U	19 U	19 U	19 U	20 U
Total Heptachlorobiphenyls	pg/L	NA	-- --	-- --	-- --	-- --	-- --	-- --	20 U	-- --	**4,700 J**	19 U	19 U	19 U	19 U	20 U
Total Nonachlorobiphenyls	pg/L	NA	-- --	-- --	-- --	-- --	-- --	-- --	30 U	-- --	200 U	19 U	19 U	19 U	19 U	20 U
Total Octachlorobiphenyls	pg/L	NA	-- --	-- --	-- --	-- --	-- --	-- --	20 U	-- --	200 U	19 U	19 U	19 U	19 U	20 U
TOTAL PCBs	pg/L	7	6.2	**8.6**	**44**	**156**	**263**	**11,076**	**710 J**	**7,100 J**	**180,000 J**	**130 J**	**130 J**	**220 J**	**200 J**	**92 J**

Notes:
FD – Field duplicate
J - The reported value is an estimated concentration.
N – Sample is not part of a field duplicate pair
NA - Not applicable
P – Parent sample of field duplicate
PCB - polychlorinated biphenyls
U - The analyte was not detected at or above the limit of detection (LOD). (sometimes validators will elevate the limit due to the "B" qualifier using the 5x/10x rule so this definition is different than the lab description).
Bolded values indicate that the reported concentration exceeds the PAL.

Table D-20. Total PCBs (Congeners) in Groundwater - 2019 and 2022

Location Name	Sample Name	Sample type	Total PCBs (Sum of congeners with ND as null) Result (pg/L)	Total number of PCB congeners detected
		PAL	7	
MW1-2	MW1-2-191029	P	6.2	4
MW1-2	FD-191029-01	FD	**8.6**	9
MW1-18	MW1-18-191021	N	**44**	38
MW1-64	MW1-64-191024	N	**156**	35
MW1-65	MW1-65-191021	N	**263**	62
MW1-67	MW1-67-191028	N	**11,076**	114
MW1-69	MW1-69-220511	N	**713**	18
MW1-70	MW1-70-220502	N	**7,090**	111
MW1-71	MW1-71-220512	N	**177,289**	80
MW1-72	MW1-72-220512	N	**131**	5
MW1-73	MW1-73-220513	N	**215**	3
MW1-74	MW1-74-220718	N	**196**	3
MW1-75	MW1-75-220718	N	**92**	3

Notes:
FD – Field duplicate
N – Sample is not part of a field duplicate pair
P – Parent sample of field duplicate
U - The analyte was not detected at or above the limit of detection (LOD). (sometimes validators will elevate the limit due to the "B" qualifier using the 5x/10x rule so this definition is different than the lab description).
PCB - polychlorinated biphenyls
Bolded values indicate that the reported concentration exceeds the PAL.
pg/L - picograms per liter

Table D-21. 1,4-Dioxane in Groundwater Monitoring Wells - 2019 and 2022

Location Name	Sample Name	Sample Collection Date	Screened Interval (ft bgs)	Sample Type	PAL (µg/L)	1,4-Dioxane (µg/L)
MW1-42	MW1-42-191022	10/22/2019	15 - 25	N	0.44	0.6 U
MW1-43	MW1-43-191023	10/23/2019	15 - 25	N	0.44	**0.6 J**
MW1-44	MW1-44-191024	10/24/2019	18 - 28	N	0.44	0.6 U
MW1-45	MW1-45-191022	10/22/2019	15 - 25	N	0.44	**1.1**
MW1-46	MW1-46-191025	10/25/2019	24 - 34	P	0.44	**40**
	FD-191025-01	10/25/2019	24 - 34	FD	0.44	**46**
MW1-47	MW1-47-191025	10/25/2019	15 - 25	N	0.44	**32**
MW1-48	MW1-48-191028	10/28/2019	15 - 25	N	0.44	**2.5**
MW1-62	MW1-62-191024	10/24/2019	31 - 41	N	0.44	**15**
MW1-63	MW1-63-191025	10/25/2019	30 - 40	N	0.44	**110**
MW1-64	MW1-64-191024	10/24/2019	45 - 55	N	0.44	**43**
MW1-65	MW1-65-191021	10/21/2019	53 - 63	N	0.44	**6.3**
MW1-67	MW1-67-191028	10/28/2019	5 - 15	N	0.44	0.6 U
MW1-69	MW1-69-220511	5/11/2022	42 - 52	N	0.44	0.053 UJ
MW1-70	MW1-70-220502	5/2/2022	70 - 80	N	0.44	0.51 U
MW1-71	MW1-71-220512	5/12/2022	95 - 100	N	0.44	0.056 UJ
MW1-72	MW1-72-220512	5/12/2022	60 - 70	P	0.44	1.8 UJ
	FD-220512-02	5/12/2022	60 - 70	FD	0.44	1.8 UJ
MW1-73	MW1-73-220513	5/13/2022	90 - 100	N	0.44	0.055 UJ
MW1-74	MW1-74-220718	7/18/2022	45 - 55	N	0.44	**2.2 J**
MW1-75	MW1-75-220718	7/18/2022	75 - 80	N	0.44	0.17 J

Notes:
Samples analyzed using EPA Method 8270D.
FD - Field Duplicate
J - The reported value is an estimated concentration.
N – Sample is not part of a field duplicate pair
P – Parent sample of field duplicate
PAL - Project Action Limit
U - The analyte was not detected at or above the stated limit. (sometimes validators will elevate the limit due to the "B" qualifier using the 5x/10x rule so this definition is different than the lab description).
Underlined values represent analytes not detected at or above the stated limit, which exceeds the PAL.
Bolded values indicate that the reported concentration exceeds the PAL.
µg/L – micrograms per liter

Table D-22. PFAS Compounds in Groundwater Monitoring Wells - 2019 and 2022

Location Name			MW1-59	MW1-61		MW1-62	MW1-64	MW1-69
Sample Name			MW1-59-191023	MW1-61-191028	FD-191028-01	MW1-62-191024	MW1-64-191024	MW1-69-220511
Sample Collection Date			10/23/2019	10/28/2019	10/28/2019	10/24/2019	10/24/2019	5/11/2022
Screened Interval (ft bgs)			60 - 70	3 - 13	3 - 13	31 - 41	45 - 55	42 - 52
Sample Type			N	P	FD	N	N	N
Analyte Name	**Units**	**PAL [a]**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Perfluorooctane sulfonate (PFOS)	ng/L	4	0.86U	**4.21J**	3.92J	1.32J	1.32J	2.3UJ
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	NE	0.86U	1.04U	1.04U	0.86U	0.83U	2.3UJ
N-methylperfluorooctane sulfonamidoacetic acid (NMeFOSAA)	ng/L	NE	0.86U	1.04U	1.04U	0.86U	0.83U	2.3UJ
Perfluorobutanesulfonic acid (PFBS)	ng/L	601	0.43U	2.34J	2.12J	1.99J	3.27J	2.3UJ
Perfluorodecanoic acid (PFDA)	ng/L	NE	0.43U	0.44J	0.40J	0.43U	0.42U	2.3UJ
Perfluoroheptanoic acid (PFHpA)	ng/L	NE	0.86U	1.74J	1.63J	0.57J	2.01J	2.3UJ
Perfluorohexanesulfonic acid (PFHxS)	ng/L	39	0.34U	1.74J	1.61J	1.95J	2.46J	2.3UJ
Perfluorononanoic acid (PFNA)	ng/L	6	0.86U	0.87J	0.89J	0.86U	0.32J	2.3UJ
Perfluorooctanoic acid (PFOA)	ng/L	6	1.29U	4.36J	4.46J	1.93J	4.70	2.3UJ
Perfluorotetradecanoic acid (PFTeDA)	ng/L	NE	1.72U	2.08U	2.08U	1.72U	1.67U	2.3UJ
Perfluorotridecanoic acid (PFTrDA)	ng/L	NE	0.43U	0.52U	0.52U	0.43U	0.42U	2.3UJ
Perfluoroundecanoic acid (PFUnA)	ng/L	NE	0.43U	0.52U	0.52U	0.43U	0.42U	4.32J
Perfluorododecanoic acid (PFDoA)	ng/L	NE	0.43U	0.52U	0.52U	0.43U	0.42U	2.3UJ
Perfluorohexanoic acid (PFHxA)	ng/L	NE	1.29U	2.72J	2.69J	1.61J	4.33	2.3UJ

Table D-22. PFAS Compounds in Groundwater Monitoring Wells - 2019 and 2022 (continued)

Location Name			MW1-70	MW1-71	MW1-72		MW1-73	MW1-74
Sample Name			MW1-70-220502	MW1-71-220512	MW1-72-220512	FD-220512-02	MW1-73-220513	MW1-74-220718
Sample Collection Date			5/2/2022	5/12/2022	5/12/2022	5/12/2022	5/13/2022	7/18/2022
Screened Interval (ft bgs)			70 - 80	95 - 100	60 - 70	60 - 70	90 - 100	45 - 55
Sample Type			N	N	P	FD	N	N
Analyte Name	**Units**	**PAL [a]**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Perfluorooctane sulfonate (PFOS)	ng/L	4	2.25 U	2.56 UJ	2.45 UJ	2.39 UJ	2.36 UJ	2.25 U
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	NE	2.25 U	2.56 UJ	2.45 UJ	2.39 UJ	2.36 UJ	2.25 U
N-methylperfluorooctane sulfonamidoacetic acid (NMeFOSAA)	ng/L	NE	2.25 U	2.56 UJ	2.45 UJ	2.39 UJ	2.36 UJ	1.18 J
Perfluorobutanesulfonic acid (PFBS)	ng/L	601	2.25 U	2.56 UJ	2.45 UJ	2.39 UJ	2.36 UJ	2.25 U
Perfluorodecanoic acid (PFDA)	ng/L	NE	2.25 U	2.56 UJ	2.45 UJ	2.39 UJ	2.36 UJ	2.25 U
Perfluoroheptanoic acid (PFHpA)	ng/L	NE	2.25 U	2.56 UJ	2.45 UJ	2.39 UJ	2.36 UJ	2.25 U
Perfluorohexanesulfonic acid (PFHxS)	ng/L	39	2.25 UJ	2.56 UJ	2.45 UJ	2.39 UJ	2.36 UJ	2.25 U
Perfluorononanoic acid (PFNA)	ng/L	6	2.32 UJ	2.56 UJ	2.45 UJ	2.39 UJ	2.36 UJ	2.25 U
Perfluorooctanoic acid (PFOA)	ng/L	6	2.25 R	2.56 UJ	2.45 UJ	2.39 UJ	2.36 UJ	2.25 U
Perfluorotetradecanoic acid (PFTeDA)	ng/L	NE	2.25 U	2.56 UJ	2.45 UJ	2.39 UJ	2.36 UJ	2.25 U
Perfluorotridecanoic acid (PFTrDA)	ng/L	NE	2.25 U	2.56 UJ	2.45 UJ	2.39 UJ	2.36 UJ	2.25 U
Perfluoroundecanoic acid (PFUnA)	ng/L	NE	2.25 U	2.56 UJ	2.45 UJ	2.39 UJ	2.36 UJ	1.38 J
Perfluorododecanoic acid (PFDoA)	ng/L	NE	2.25 U	2.56 UJ	2.45 UJ	2.39 UJ	2.36 UJ	1.31 J
Perfluorohexanoic acid (PFHxA)	ng/L	NE	2.25 U	2.56 UJ	2.45 UJ	2.39 UJ	2.36 UJ	2.25 U

Table D-22. PFAS Compounds in Groundwater Monitoring Wells - 2019 and 2022 (continued)

Location Name			MW1-75	
Sample Name			MW1-75-220718	MW1-75-220718
Sample Collection Date			7/18/2022	7/18/2022
Screened Interval (ft bgs)			45 - 55	75 - 80
Sample Type			P	FD
Analyte Name	**Units**	**PAL [a]**	**Result**	**Result**
Perfluorooctane sulfonate (PFOS)	ng/L	4	2.21 U	2.22 U
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	NE	2.21 U	2.22 U
N-methylperfluorooctane sulfonamidoacetic acid (NMeFOSAA)	ng/L	NE	2.21 U	2.22 U
Perfluorobutanesulfonic acid (PFBS)	ng/L	601	2.21 U	2.22 U
Perfluorodecanoic acid (PFDA)	ng/L	NE	2.21 U	2.22 U
Perfluoroheptanoic acid (PFHpA)	ng/L	NE	2.21 U	2.22 U
Perfluorohexanesulfonic acid (PFHxS)	ng/L	39	2.21 U	2.22 U
Perfluorononanoic acid (PFNA)	ng/L	6	2.21 U	2.22 U
Perfluorooctanoic acid (PFOA)	ng/L	6	2.21 U	2.22 U
Perfluorotetradecanoic acid (PFTeDA)	ng/L	NE	2.21 U	2.22 U
Perfluorotridecanoic acid (PFTrDA)	ng/L	NE	2.21 U	2.22 U
Perfluoroundecanoic acid (PFUnA)	ng/L	NE	2.21 U	2.22 U
Perfluorododecanoic acid (PFDoA)	ng/L	NE	2.21 U	2.22 U
Perfluorohexanoic acid (PFHxA)	ng/L	NE	2.21 U	2.22 U

Notes:
PFAS compounds analyzed by DoD QSM 5.1
FD - Field Duplicate
J - The reported value is an estimated concentration.
N – Sample is not part of a field duplicate pair
NE - Not established.
P – Parent sample of field duplicate.
PAL - Project action limit as established in the sampling and analysis plan.
R - The reported value is unusable, rejected.
U - The analyte was not detected at or above the stated limit. (sometimes validators will elevate the limit due to the "B" qualifier using the 5x/10x rule so this definition is different than the lab description).
UJ - The analyte was not detected at the stated sample quantitation limit, which is an estimated value.
Bold text indicates that the result or the LOD exceeds the PAL.
ng/L - nanograms per liter
[a] PALs updated based on July 6, 2022 update to DoD memorandum (DoD, 2022). PAL values set to residential scenario screening levels for tap water with a hazard quotient of 0.1.

Table D-23. Laboratory MNA Parameters - 2019

Location Name		MW1-42	MW1-43	MW1-44	MW1-45	MW1-46		MW1-47
Sample Name		MW1-42-191022	MW1-43-191023	MW1-44-191024	MW1-45-191022	MW1-46-191025	FD-191025-01	MW1-47-191025
Sample Collection Date		10/22/2019	10/23/2019	10/24/2019	10/22/2019	10/25/2019	10/25/2019	10/25/2019
Screened Interval (ft bgs)		15 - 25	15 - 25	18 - 28	15 - 25	24 - 34	24 - 34	15 - 25
Sample Type		N	N	N	N	P	FD	N
Analyte Name	**Units**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Sulfide	µg/L	1,600 J	1,060 J	2,000 R	1,330 J	1,350 J	1,410 J	1,160 J
Nitrite	µg/L	53 J	481	623	40 U	1,050 J	1,100 J	130 UJ
Sulfate	µg/L	220 J	27,800	15,800	21,500	65,500	71,200	1,590
Nitrate	µg/L	40	40 U	40 U	40 U	180 UJ	180 UJ	180 UJ
Chloride	µg/L	28,100	325,000	332,000	108,000	210,000	210,000	24,100
Dissolved Organic Carbon (DOC)	µg/L	5,750	6,500	5,740	9,640	9,150	9,150	25,100
Ethane	µg/L	23	25	1.4 J	28	39 J	91 J	170
Ethene	µg/L	21	82	3.4 J	1.8 U	79	75	57
Methane	µg/L	3,600	7,300	2,500	6,300	6,300	4,100	17,000

Location Name		MW1-48	MW1-49		MW1-50	MW1-51	MW1-52	MW1-53
Sample Name		MW1-48-191028	MW1-49-191022	FD-191022-01	MW1-50-191023	MW1-51-191021	MW1-52-191021	MW1-53-191023
Sample Collection Date		10/28/2019	10/22/2019	10/22/2019	10/23/2019	10/21/2019	10/21/2019	10/23/2019
Screened Interval (ft bgs)		15 - 25	5 - 15	5 - 15	5 - 15	10 - 20	7 - 17	5 - 15
Sample Type		N	P	FD	N	N	N	N
Analyte Name	**Units**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Sulfide	µg/L	1,390 J	2,100	1,640 J	607 J	1,620 J	1,390 J	1,600 J
Nitrite	µg/L	40 UJ	40 UJ	40 UJ	40 UJ	40 UJ	40 U	40 U
Sulfate	µg/L	363 J	10,800	11,000	8,470	3,390	713 J	210 J
Nitrate	µg/L	40 UJ	35 J	35 J	225 UJ	40 UJ	40 U	38 J
Chloride	µg/L	21,700	5,850	6,990	4,710	3,220	3,760	5,170
Dissolved Organic Carbon (DOC)	µg/L	17,400	1,040	1,070	578 J	1,300	1,760	3,500 J
Ethane	µg/L	130	0.88 J	0.79 J	1.7 UJ	0.73 J	4.5 J	6.0
Ethene	µg/L	1.8 U	4.0 J	4.1 J	1.8 UJ	7.0	15	18
Methane	µg/L	15,000	46	40	28 J	340	3,000	7,500

Table D-23. Laboratory MNA Parameters – 2019 (continued)

Location Name		MW1-54	MW1-55	MW1-56	MW1-56	MW1-57	MW1-57	MW1-57
Sample Name		MW1-54-191021	MW1-55-191024	MW1-56-12-191023	MW1-56-24-191023	MW1-57-10-191022	MW1-57-16-191022	MW1-57-32-191022
Sample Collection Date		10/21/2019	10/24/2019	10/23/2019	10/23/2019	10/22/2019	10/22/2019	10/22/2019
Screened Interval (ft bgs)		29 - 39	26.5 - 36.5	8 - 12	20 - 24	6 - 10.5	12 - 16	26 - 31
Sample Type		N	N	N	N	N	N	N
Analyte Name	**Units**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Sulfide	µg/L	1,540 J	1,060 J	1,000 J	1,250 J	1,160 J	906 J	1,480 J
Nitrite	µg/L	40 UJ	130 R	112 J	100 J	40 U	82 J	40 UJ
Sulfate	µg/L	5,050	332 J	41,800	2,880	5,620	306 J	234 J
Nitrate	µg/L	1,010 J	180 R	40 U	39 J	40 U	40 UJ	40 UJ
Chloride	µg/L	4,250	3,250	58,700	34,400	182,000	43,300	5,880
Dissolved Organic Carbon (DOC)	µg/L	834	1,270	37,500	6,790	25,700	9,950	3,970
Ethane	µg/L	1.7 U	1.1 J	12	3.6 J	48	5.1	3.8 J
Ethene	µg/L	1.8 U	1.1 J	71	1.4 J	120	5.6	27
Methane	µg/L	0.5 J	160	8,400	7,000	2,200	7,700	3,800

Location Name		MW1-58	MW1-58	MW1-58	MW1-59	MW1-61	MW1-62	MW1-63
Sample Name		MW1-58-9-191024	MW1-58-19-191024	MW1-58-39.5-191024	MW1-59-191023	MW1-61-191028	MW1-62-191024	MW1-63-191025
Sample Collection Date		10/24/2019	10/24/2019	10/24/2019	10/23/2019	10/28/2019	10/24/2019	10/25/2019
Screened Interval (ft bgs)		5 - 9	15 - 19	31 - 35	60 - 70	3 - 13	31 - 41	30 - 40
Sample Type		N	N	N	N	N	N	N
Analyte Name	**Units**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Sulfide	µg/L	1,950 J	1,350 J	1,430 J	1,370 J	1,450 J	1,450 J	1,640 J
Nitrite	µg/L	242	130 R	224 J	40 UJ	40 UJ	355 J	475 J
Sulfate	µg/L	352 J	198 U	44,800	620 J	697 J	11,900	8,670
Nitrate	µg/L	40 U	250 J	180 R	35 J	36 J	180 R	180 UJ
Chloride	µg/L	99,500	4,580	31,000	1,790	4,320	67,200 J	84,500
Dissolved Organic Carbon (DOC)	µg/L	16,500	6,590	2,580	2,210	5,840	7,100	12,100
Ethane	µg/L	190	24	4.2 J	1.2 J	8.8	5.6	67
Ethene	µg/L	830	0.91 J	1.1 J	0.47 J	8.8	11 J	40
Methane	µg/L	6,700	7,500	8,500	5,700	10,000	390	8,100

Table D-23. Laboratory MNA Parameters – 2019 (continued)

Location Name		MW1-64	MW1-65	MW1-67	MW1-68
Sample Name		MW1-64-191024	MW1-65-191021	MW1-67-191028	MW1-68-191028
Sample Collection Date		10/24/2019	10/21/2019	10/28/2019	10/28/2019
Screened Interval (ft bgs)		45 - 55	53 - 63	5 - 15	37 - 47
Sample Type		N	N	N	N
Analyte Name	**Units**	**Result**	**Result**	**Result**	**Result**
Sulfide	µg/L	2,180	983 J	1,160 J	1,480 J
Nitrite	µg/L	114 J	40 UJ	40 UJ	40 UJ
Sulfate	µg/L	14,200	37,200	624 J	430 J
Nitrate	µg/L	40 R	40 UJ	40 UJ	39 J
Chloride	µg/L	63,600	380,000	20,900	1,890
Dissolved Organic Carbon (DOC)	µg/L	11,100	5,920	11,600	2,850
Ethane	µg/L	22	4.3 J	6.5	6.5
Ethene	µg/L	21	8.2	1.8 U	7.3
Methane	µg/L	3,700	2,200	19,000	7,600

Notes:
*No PALs designated for these compounds
FD - Field Duplicate
J - The reported value is an estimated concentration.
P – Parent sample of field duplicate
MNA - Monitored Natural Attenuation
N – Sample is not part of a field duplicate pair
R - The reported value is unusable, rejected.
U - The analyte was not detected at or above the stated limit. (sometimes validators will elevate the limit due to the "B" qualifier using the 5x/10x rule so this definition is different than the lab description).
UJ - The analyte was not detected at the stated sample quantitation limit, which is an estimated value

Table D-24. Field MNA Parameters - 2019 and 2022

Location Name		MW1-2	MW1-18	MW1-42	MW1-43	MW1-44	MW1-45	MW1-46	MW1-47	MW1-48	MW1-49
Sample Name		MW1-2-191029	MW1-18-191021	MW1-42-191022	MW1-43-191023	MW1-44-191024	MW1-45-191022	MW1-46-191025	MW1-47-191025	MW1-48-191028	MW1-49-191022
Sample Collection Date		10/29/2019	10/21/2019	10/22/2019	10/23/2019	10/24/2019	10/22/2019	10/25/2019	10/25/2019	10/28/2019	10/22/2019
Screened Interval (ft bgs)		12.5 - 17.5	12 - 17	15 - 25	15 - 25	18 - 28	15 - 25	24 - 34	15 - 25	15 - 25	5 - 15
Analyte	**Units**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Dissolved oxygen	mg/L	0	0	0.20	0.06	0	0	0	0	0.75	0.08
Oxidation Reduction Potential	mV	-30	-115	-126	-134	-210	-221	-133	-54	-31	-87
pH	pH	6.73	7.05	7.38	7.66	8.80	8.84	7.23	6.37	6.35	7.51
Conductivity	mS/cm	0.787	0.709	0.586	1.91	1.69	1.35	2.11	1.06	0.683	0.247
Temperature	Deg_C	11.04	13.45	15.09	13.19	14.17	15.11	15.28	15.09	12.21	11.77
Turbidity	NTU	4.0	14.3	0	9.8	5.9	94.7	71.0	47.8	26.3	3.3

Location Name		MW1-50	MW1-51	MW1-52	MW1-53	MW1-54	MW1-55	MW1-56	MW1-56	MW1-57	MW1-57
Sample Name		MW1-50-191023	MW1-51-191021	MW1-52-191021	MW1-53-191023	MW1-54-191021	MW1-55-191024	MW1-56-12-191023	MW1-56-24-191023	MW1-57-10-191022	MW1-57-16-191022
Sample Collection Date		10/23/2019	10/21/2019	10/21/2019	10/23/2019	10/21/2019	10/24/2019	10/23/2019	10/23/2019	10/22/2019	10/22/2019
Screened Interval (ft bgs)		5 - 15	10 - 20	7 - 17	5 - 15	29 - 39	26.5 - 36.5	8 - 12	20 - 24	6 - 10.5	12 - 16
Analyte	**Units**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Dissolved oxygen	mg/L	2.25	0	0	0	0.69	0	0.01	0	8.96	0
Oxidation Reduction Potential	mV	36	-171	-181	-131	253	4	-23	215	-2	-3
pH	pH	7.45	8.68	8.75	8.23	6.93	7.15	6.63	6.79	6.56	6.36
Conductivity	mS/cm	0.235	0.334	0.347	0.378	0.194	0.263	0.852	0.467	1.09	0.445
Temperature	Deg_C	11.59	12.28	12.47	13.00	12.55	14.00	11.87	14.04	14.15	15.4
Turbidity	NTU	1.1	9.8	9.6	9.6	194	59.8	9.1	26.0	170	20.8

Table D-24. Field MNA Parameters - 2019 and 2022 (continued)

Location Name		MW1-57	MW1-58	MW1-58	MW1-58	MW1-59	MW1-60	MW1-61	MW1-62	MW1-63	MW1-64
Sample Name		MW1-57-32-191022	MW1-58-9-191024	MW1-58-19-191024	MW1-58-39.5-191024	MW1-59-191023	MW1-60-191023	MW1-61-191028	MW1-62-191024	MW1-63-191025	MW1-64-191024
Sample Collection Date		10/22/2019	10/24/2019	10/24/2019	10/24/2019	10/23/2019	10/23/2019	10/28/2019	10/24/2019	10/25/2019	10/24/2019
Screened Interval (ft bgs)		26 - 31	5 - 9	15 - 19	31 - 35	60 - 70	15 - 25	3 - 13	31 - 41	30 - 40	45 - 55
Analyte	**Units**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Dissolved oxygen	mg/L	0.32	6.87	0.26	0.03	0	0	0	0	0	0.05
Oxidation Reduction Potential	mV	-46	-47	-82	-151	-230	-158	-92	-136	-61	-78
pH	pH	7.01	6.52	6.94	7.60	8.62	8.08	7.40	7.31	6.77	6.81
Conductivity	mS/cm	0.381	0.880	0.395	0.382	0.268	0.333	0.438	0.899	1.20	1.09
Temperature	Deg_C	14.66	14.86	14.33	13.57	11.14	11.82	13.94	15.53	11.85	11.29
Turbidity	NTU	5.1	49.1	7.8	19.7	233	124	42.2	10.0	73.9	145

Location Name		MW1-65	MW1-66	MW1-67	MW1-68	MW1-69	MW1-70	MW1-71	MW1-72	MW1-73	MW1-74	MW1-75
Sample Name		MW1-65-191021	MW1-66-191024	MW1-67-191028	MW1-68-191028	MW1-69-220511	MW1-70-220502	MW1-71-220512	MW1-72-220512	MW1-73-220513	MW1-74-220718	MW1-75-220718
Sample Collection Date		10/21/2019	10/24/2019	10/28/2019	10/28/2019	5/11/2022	5/2/2022	5/12/2022	5/12/2022	5/13/2022	7/18/2022	7/18/2022
Screened Interval (ft bgs)		53 - 63	5 - 20	5 - 15	37 - 47	42 - 52	70 - 80	95 - 100	60 - 70	90 - 100	45 - 55	75 - 80
Analyte	**Units**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Dissolved oxygen	mg/L	0	0	0.02	0	0	6.98	0	0	0	0.73	0.71
Oxidation Reduction Potential	mV	-247	-105	-203	-212	-389	-425	-142	-376	-291	0	10
pH	pH	7.53	6.25	8.55	8.41	7.4	8.05	7.49	7.43	7.78	3.21	2.62
Conductivity	mS/cm	2.26	0.434	1.29	0.289	0.275	0.315	0.319	2.00	1.21	0.895	1.60
Temperature	Deg_C	12.29	15.17	9.10	11.75	11.98	11.79	13.1	12.48	11.55	16.38	16.61
Turbidity	NTU	57.0	148	5.0	75.6	9.7	0	995	3.2	7.9	34.2	236

Notes:
Deg_C - degrees celsius
mg/L - milligrams per liter
MNA - Monitored Natural Attenuation
mS/cm - millisiemens per centimeter
mV - millivolts
NTU - nephelometric turbidity units
*Fe^2 and sulfite not analyzed during field activities

Table D-25. Microbial Data for Groundwater Monitoring Wells - 2019

Location Name			MW1-42		MW1-45		MW1-46		MW1-46		MW1-47		MW1-48		MW1-50		MW1-50	
Sample Name			MW1-42-191022		MW1-45-191022		MW1-46-191025		FD-191025-01		MW1-47-191025		MW1-48-191028		MW1-50-191023		FD-191023-01	
Sample Collection Date			10/22/2019		10/22/2019		10/25/2019		10/25/2019		10/25/2019		10/28/2019		10/23/2019		10/23/2019	
Screened Interval (ft bgs)			15 - 25		15 - 25		24 - 34		24 - 34		15 - 25		15 - 25		5 - 15		5 - 15	
Sample Type			N		N		P		FD		N		N		P		FD	
Analyte Name	**Units**	**PAL**	**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
Vinyl Chloride Reductase (VCR)	cells/mL	NA	3,700		35.5		956		861		178		560		0.5	U	0.5	U
Phenol Hydroxylase (PHE)	cells/mL	NA	1,230		12.3	U	264		289		10		110		5.0	U	18	
Toluene Dioxygenase (TOD)	cells/mL	NA	27		12.3	U	4.8	U	4.7	U	5.0	U	4.7	U	5.0	U	5.0	U
BAV1 Vinyl Chloride Reductase (BVC)	cells/mL	NA	666		0.3	J	753		666		537		15		0.5	U	0.2	J
Dehalobacter spp. (DHBt)	cells/mL	NA	4,520		79.3		1,860		1,670		2,220		4.7	U	5.0	U	5.0	U
Desulfitobacterium spp. (DSB)	cells/mL	NA	723		12.3	U	1,880		2,890		2,060		2,020		1,170	J	4,760	J
Desulfuromonas spp. (DSM)	cells/mL	NA	38		12.3	U	19		19		5.0	U	2.5	J	294	J	4.5	J
Total Eubacteria (EBAC)	cells/mL	NA	2,150,000		15,600		738,000		894,000		1,570,000		15,700,000		91,100		127,000	
Methanogens (MGN)	cells/mL	NA	1,690		12.3	U	63		51		180		12,200		5.0	U	5.0	U
Soluble Methane Monooxygenase (SMMO)	cells/mL	NA	2,830		12.3	U	4.8	U	4.7	U	5.0	U	4.7	U	5.0	U	5.0	U
tceA Reductase (TCE)	cells/mL	NA	36		1.2	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Sulfate Reducing Bacteria (APS)	cells/mL	NA	6,810		266		70,600		72,900		45,300		109,000		3,180	J	1,850	J
cerA Reductase (CER)	cells/mL	NA	17		12.3	U	11		1.0	J	5.0	U	4.7	U	5.0	U	5.0	U
Chloroform Reductase (CFR)	cells/mL	NA	5.0	U	12.3	U	4.8	U	4.7	U	5.0	U	4.7	U	5.0	U	5.0	U
1,1 DCA Reductase (DCA)	cells/mL	NA	5.0	U	12.3	U	4.8	U	4.7	U	5.0	U	4.7	U	5.0	U	5.0	U
1,2 DCA Reductase (DCAR)	cells/mL	NA	5.0	U	12.3	U	4.8	U	4.7	U	5.0	U	4.7	U	5.0	U	5.0	U
Dehalobacter DCM (DCM)	cells/mL	NA	5.0	U	12.3	U	4.8	U	4.7	U	5.0	U	4.7	U	5.0	U	5.0	U
Dichloromethane Dehalogenase (DCMA)	cells/mL	NA	5.0	U	12.3	U	4.8	U	4.7	U	5.0	U	4.7	U	5.0	U	5.0	U
Dehalobium chlorocoercia (DECO)	cells/mL	NA	5,010		12.3	U	5,940		5,780		4,910		28,500		5.0	U	101	
Dehalococcoides (DHC)	cells/mL	NA	20,600		72.2		10,700		9,400		8,920		5,780		4.5	J	16	J
Dehalogenimonas spp. (DHG)	cells/mL	NA	14,000		590		52,500		42,500		4,200		4.7	U	5.0	U	246	
Ethene Monooxygenase (EtnC)	cells/mL	NA	21		12.3	U	865		968		5	U	62		5.0	U	5.0	U
Epoxyalkane Transferase (EtnE)	cells/mL	NA	62		12.3	U	5,130		7,090		111		4.7	U	53		5.0	U
PCE Reductase (PCE-1)	cells/mL	NA	17		12.3	U	4.8	U	4.7	U	5.0	U	4.7	U	5.0	U	5.0	U
PCE Reductase (PCE-2)	cells/mL	NA	5.0	U	12.3	U	4.8	U	4.7	U	5.0	U	4.7	U	5.0	U	5.0	U
Toluene Monooxygenase 2 (RDEG)	cells/mL	NA	5.0	U	12.3	U	105		109		5.0	U	305		20		5.0	U
Toluene Monooxygenase (RMO)	cells/mL	NA	7,170		12.3	U	4,150		3,220		5.0	U	1,850		274		5.0	U
Trichlorobenzene Dioxygenase (TCBO)	cells/mL	NA	5.0	U	12.3	U	4.8	U	4.7	U	5.0	U	4.7	U	5.0	U	5.0	U
trans-1,2-DCE Reductase (TDR)	cells/mL	NA	29,400		12.3	U	23,400	J	12,200	J	5.0	U	4.7	U	5.0	U	5.0	U

Table D-25. Microbial Data for Groundwater Monitoring Wells – 2019 (continued)

Location Name			MW1-51		MW1-52		MW1-57		MW1-57		MW1-57		MW1-58		MW1-59									
Sample Name			MW1-51-191022		MW1-52-191021		MW1-57-10-191022		MW1-57-16-191022		MW1-57-32-191022		MW1-58-9-191024		MW1-59-191023									
Sample Collection Date			10/22/2019		10/21/2019		10/22/2019		10/22/2019		10/22/2019		10/24/2019		10/23/2019									
Screened Interval (ft bgs)			10 - 20		7 - 17		6 - 10.5		12 - 16		26 - 31		5 - 9		60 - 70									
Sample Type			N		N		N		N		N		N		N									
Analyte Name	**Units**	**PAL**	**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**									
Vinyl Chloride Reductase (VCR)	cells/mL	NA	2.1		26		1.3		11		730		445		1.1	U								
Phenol Hydroxylase (PHE)	cells/mL	NA	10	U	4.2		7.2	U	1,170		5,120		27		11	U								
Toluene Dioxygenase (TOD)	cells/mL	NA	0.2	J	3.5	U	7.2	U	5.0	U	4.5	U	5.0	U	11	U								
BAV1 Vinyl Chloride Reductase (BVC)	cells/mL	NA	1.0	U	11		0.5	J	27		200		4,180		1.1	U								
Dehalobacter spp. (DHBt)	cells/mL	NA	10	U	79		182		2,010		6,960		1,190		11	U								
Desulfitobacterium spp. (DSB)	cells/mL	NA	10	U	35		178		2,690		5,500		1,390		11	U								
Desulfuromonas spp. (DSM)	cells/mL	NA	10	U	118		7.2	U	1,060		39,800		13		11	U								
Total Eubacteria (EBAC)	cells/mL	NA	1,760		165,000		34,100		5,620,000		1,470,000		669,000		2,760									
Methanogens (MGN)	cells/mL	NA	10	U	20		28		16,400		8,730		662		11	U								
Soluble Methane Monooxygenase (SMMO)	cells/mL	NA	10	U	101		7.2	U	5.0	U	4.5	U	5.0	U	11	U								
tceA Reductase (TCE)	cells/mL	NA	1.0	U	5.0		0.7	U	0.5	U	0.5	U	0.5	U	1.1	U								
Sulfate Reducing Bacteria (APS)	cells/mL	NA	10	U	6,660		7.2	U	4,070		33,100		16,500		11	U								
cerA Reductase (CER)	cells/mL	NA	10	U	3.5	U	7.2	U	5.0	U	4.5	U	0	J	11	U								
Chloroform Reductase (CFR)	cells/mL	NA	10	U	3.5	U	7.2	U	5.0	U	4.5	U	5.0	U	11	U								
1,1 DCA Reductase (DCA)	cells/mL	NA	10	U	3.5	U	7.2	U	5.0	U	4.5	U	5.0	U	11	U								
1,2 DCA Reductase (DCAR)	cells/mL	NA	10	U	3.5	U	7.2	U	5.0	U	4.5	U	5.0	U	11	U								
Dehalobacter DCM (DCM)	cells/mL	NA	10	U	3.5	U	7.2	U	5.0	U	4.5	U	5.0	U	11	U								
Dichloromethane Dehalogenase (DCMA)	cells/mL	NA	10	U	3.5	U	7.2	U	5.0	U	4.5	U	5.0	U	11	U								
Dehalobium chlorocoercia (DECO)	cells/mL	NA	10	U	749		64		939		9,750		2,970		11	U								
Dehalococcoides (DHC)	cells/mL	NA	26		594		14		428		10,200		187,000		1.3									
Dehalogenimonas spp. (DHG)	cells/mL	NA	10	U	11,800		7.2	U	5.0	U	199		2,510		11	U								
Ethene Monooxygenase (EtnC)	cells/mL	NA	10	U	28		7.2	U	5.0	U	519		5.0	U	11	U								
Epoxyalkane Transferase (EtnE)	cells/mL	NA	10	U	30		7.2	U	5.0	U	3,490		5.0	U	11	U								
PCE Reductase (PCE-1)	cells/mL	NA	10	U	3.5	U	238		124,000		378		5.0	U	11	U								
PCE Reductase (PCE-2)	cells/mL	NA	10	U	3.5	U	7.2	U	5.0	U	86		5.0	U	11	U								
Toluene Monooxygenase 2 (RDEG)	cells/mL	NA	10	U	79		7.2	U	272		2,050		61		11	U								
Toluene Monooxygenase (RMO)	cells/mL	NA	10	U	3.5	U	7.2	U	21		7,300		5.0	U	11	U								
Trichlorobenzene Dioxygenase (TCBO)	cells/mL	NA	10	U	3.5	U	7.2	U	5.0	U	4.5	U	5.0	U	11	U								
trans-1,2-DCE Reductase (TDR)	cells/mL	NA	10	U	3.5	U	7.2	U	5.0	U	4.5	U	2,320		11	U								

Table D-25. Microbial Data for Groundwater Monitoring Wells – 2019 (continued)

		Location Name	MW1-68	
		Sample Name	MW1-68-191028	
		Sample Collection Date	10/28/2019	
		Screened Interval (ft bgs)	37 - 47	
		Sample Type	N	
Analyte Name	**Units**	**PAL**	**Result**	
Vinyl Chloride Reductase (VCR)	cells/mL	NA	0.1	J
Phenol Hydroxylase (PHE)	cells/mL	NA	3,970	
Toluene Dioxygenase (TOD)	cells/mL	NA	24	
BAV1 Vinyl Chloride Reductase (BVC)	cells/mL	NA	0.5	U
Dehalobacter spp. (DHBt)	cells/mL	NA	4,360	
Desulfitobacterium spp. (DSB)	cells/mL	NA	933	
Desulfuromonas spp. (DSM)	cells/mL	NA	2.5	J
Total Eubacteria (EBAC)	cells/mL	NA	4,840,000	
Methanogens (MGN)	cells/mL	NA	4.6	U
Soluble Methane Monooxygenase (SMMO)	cells/mL	NA	4.6	U
tceA Reductase (TCE)	cells/mL	NA	0.5	U
Sulfate Reducing Bacteria (APS)	cells/mL	NA	4.6	U
cerA Reductase (CER)	cells/mL	NA	4.6	U
Chloroform Reductase (CFR)	cells/mL	NA	4.6	U
1,1 DCA Reductase (DCA)	cells/mL	NA	4.6	U
1,2 DCA Reductase (DCAR)	cells/mL	NA	4.6	U
Dehalobacter DCM (DCM)	cells/mL	NA	4.6	U
Dichloromethane Dehalogenase (DCMA)	cells/mL	NA	4.6	U
Dehalobium chlorocoercia (DECO)	cells/mL	NA	1,220	
Dehalococcoides (DHC)	cells/mL	NA	28	
Dehalogenimonas spp. (DHG)	cells/mL	NA	4.6	U
Ethene Monooxygenase (EtnC)	cells/mL	NA	4.6	U
Epoxyalkane Transferase (EtnE)	cells/mL	NA	117	
PCE Reductase (PCE-1)	cells/mL	NA	4.6	U
PCE Reductase (PCE-2)	cells/mL	NA	4.6	U
Toluene Monooxygenase 2 (RDEG)	cells/mL	NA	2,550	
Toluene Monooxygenase (RMO)	cells/mL	NA	468	
Trichlorobenzene Dioxygenase (TCBO)	cells/mL	NA	4.6	U
trans-1,2-DCE Reductase (TDR)	cells/mL	NA	4.6	U

Table D-25. Microbial Data for Groundwater Monitoring Wells – 2019 (continued)

Notes:
*Samples analyzed using Microbial Insights QuantArray®-Chlor
FD - Field Duplicate
J - The reported value is an estimated concentration.
P – Parent sample of field duplicate
PAL - Project Action Limit
N – Sample is not part of the field duplicate pair
NA - Not Applicable
U - Not detected above the associated LOQ shown

Table D-26. Target VOCs in Porewater – 2019

		Location Name	PW1-11	PW1-12	PW1-15	PW1-16	PW1-17	PW1-18	PW1-20
		Sample Name	PW1-11-190606	PW1-12-190606	PW1-15-190606	PW1-16-190606	PW1-17-190606	PW1-18-190606	PW1-20-190605
		Sample Collection Date	6/6/2019	6/6/2019	6/6/2019	6/6/2019	6/6/2019	6/6/2019	6/5/2019
		Sample Type	N	N	N	N	N	N	N
Analyte Name	**Units**	**PAL [a]**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/L	8.9	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Tetrachloroethene	µg/L	2.4	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
cis-1,2-Dichloroethene	µg/L	200	64	160	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
trans-1,2-Dichloroethene	µg/L	200	0.51 J	0.97 J	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,1,1-Trichloroethane	µg/L	20,000	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Chloroethane	µg/L	700	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl Chloride	µg/L	0.02	**26**	**110**	0.015 U	0.015 U	0.015 U	0.015 U	**0.23**
1,1-Dichloroethane	µg/L	700	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,1-Dichloroethene	µg/L	700	0.5 U	0.82 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	µg/L	0.3	0.3 U	**2.5**	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U

		Location Name	PW1-21	PW1-22	PW1-23	PW1-24		PW1-28	PW1-29
		Sample Name	PW1-21-190605	PW1-22-190605	PW1-23-190605	PW1-24-190605	FD-190605-01	PW1-28-190606	PW1-29-190606
		Sample Collection Date	6/5/2019	6/5/2019	6/5/2019	6/5/2019	6/5/2019	6/6/2019	6/6/2019
		Sample Type	N	N	N	P	FD	N	N
Analyte Name	**Units**	**PAL [a]**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/L	8.9	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Tetrachloroethene	µg/L	2.4	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
cis-1,2-Dichloroethene	µg/L	200	1.4	0.3 U	2.3	0.71 J	0.78 J	27	52
trans-1,2-Dichloroethene	µg/L	200	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,1,1-Trichloroethane	µg/L	20,000	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Chloroethane	µg/L	700	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl Chloride	µg/L	0.02	**0.14**	0.015 U	**0.92**	**1.5**	**1.5**	**7.5**	**11**
1,1-Dichloroethane	µg/L	700	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,1-Dichloroethene	µg/L	700	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	**0.39 J**	**2**

Table D-26. Target VOCs in Porewater – 2019 (continued)

		Location Name	PW1-30		PW1-31		PW1-32					
		Sample Name	PW1-30-191018		PW1-31-191018		PW1-32-191018			FD-191018-01		
		Sample Collection Date	10/18/2019		10/18/2019		10/18/2019			10/18/2019		
		Sample Type	N		N		P			FD		
Analyte Name	**Units**	**PAL [a]**	**Result**		**Result**		**Result**			**Result**		
1,2-Dichloroethane	µg/L	8.9	0.3	U	0.3	U	0.3	U		0.3	U	
Tetrachloroethene	µg/L	2.4	0.3	U	0.3	U	0.3	U		0.3	U	
cis-1,2-Dichloroethene	µg/L	200	0.3	U	0.3	U	0.3	UJ		0.3	U	
trans-1,2-Dichloroethene	µg/L	200	0.3	U	0.3	U	0.3	U		0.3	U	
1,1,1-Trichloroethane	µg/L	20,000	0.3	U	0.3	U	0.3	U		0.3	U	
Chloroethane	µg/L	700	0.5	U	0.5	U	0.5	U		0.5	U	
Vinyl Chloride	µg/L	0.02	0.015	U	0.015	U	0.015	U		0.015	U	
1,1-Dichloroethane	µg/L	700	0.3	U	0.3	U	0.3	U		0.3	U	
1,1-Dichloroethene	µg/L	700	0.5	U	0.5	U	0.5	U		0.5	U	
Trichloroethene	µg/L	0.3	0.3	U	0.3	U	0.3	UJ		0.3	U	

Notes
[a] PALs updated from 2018 SAP (U.S. Navy, 2018) and are based on EPA Human Health Surface Water Criteria (40 CFR 131.45). Surrogates were used for cis-1,2-dichloroethene, chloroethane, 1,1-dichloroethane. State of Washington surface water criteria was used for vinyl chloride.
FD - Field Duplicate
J - The reported value is an estimated concentration.
N – Sample is not part of a field duplicate pair
P – Parent sample of field duplicate
PAL - Project Action Limit
U - The analyte was not detected at or above the stated limit. (sometimes validators will elevate the limit due to the "B" qualifier using the 5x/10x rule so this definition is different than the lab description).
Underlined values represent analytes not detected at or above the stated limit, which exceeds the PAL.
Bolded values indicate that the reported concentration exceeds the PAL.
µg/L - micrograms per liter

Table D-27. PCB Congeners in Porewater - 2019

Location Name			PW1-25		PW1-26		PW1-27			
Sample Name			PW1-25-190604		PW1-26-190604		PW1-27-190604		FD-190604-02	
Sample Collection Date			6/4/2019		6/4/2019		6/4/2019		6/4/2019	
Sample Type			N		N		P		FD	
Analyte	**Units**	**PAL**	**Result**		**Result**		**Result**		**Result**	
PCB-001	pg/L	NA	23	J	40	J	150	J	140	J
PCB-002	pg/L	NA	19	U	19	U	19	U	19	U
PCB-003	pg/L	NA	2.6	J	2.4	J	2.6	J	2	J
PCB-004	pg/L	NA	92	J	420		220		210	
PCB-005	pg/L	NA	24	U	24	U	24	U	24	U
PCB-006	pg/L	NA	24	U	69	J	91	J	91	J
PCB-007	pg/L	NA	24	U	24	U	24	U	24	U
PCB-008	pg/L	NA	24	U	100	J	100	J	98	J
PCB-009	pg/L	NA	48	U	48	U	48	U	48	U
PCB-010	pg/L	NA	48	U	48	U	48	U	48	U
PCB-011	pg/L	NA	24	U	24	U	24	U	24	U
PCB-012 AND 013	pg/L	NA	38	U	39	U	38	U	38	U
PCB-014	pg/L	NA	24	U	24	U	24	U	24	U
PCB-015	pg/L	NA	19	U	19	U	19	U	19	U
PCB-016	pg/L	NA	18	J	150	J	130	J	120	J
PCB-017	pg/L	NA	20	J	220		120	J	130	J
PCB-019	pg/L	NA	21	J	120	J	70	J	72	J
PCB-021 AND 033	pg/L	NA	7.4	J	76	J	38	J	39	J
PCB-022	pg/L	NA	5.1	J	56	J	37	J	41	J
PCB-023	pg/L	NA	19	U	19	U	19	U	19	U
PCB-024	pg/L	NA	19	U	19	U	4.6	J	4	J

Table D-27. PCB Congeners in Porewater – 2019 (continued)

Location Name			PW1-25		PW1-26		PW1-27			
Sample Name			PW1-25-190604		PW1-26-190604		PW1-27-190604		FD-190604-02	
Sample Collection Date			6/4/2019		6/4/2019		6/4/2019		6/4/2019	
Sample Type			N		N		P		FD	
Analyte	**Units**	**PAL**	**Result**		**Result**		**Result**		**Result**	
PCB-025	pg/L	NA	8.1	J	91	J	47	J	52	J
PCB-026 AND 029	pg/L	NA	24	J	350	J	160	J	170	J
PCB-027	pg/L	NA	12	J	70	J	21	J	24	J
PCB-028 AND 020	pg/L	NA	27	J	200	J	120	J	130	J
PCB-030 AND 018	pg/L	NA	51	J	350	J	230	J	230	J
PCB-031	pg/L	NA	28	J	180	J	110	J	120	J
PCB-032	pg/L	NA	12	J	100	J	63	J	63	J
PCB-034	pg/L	NA	19	U	19	U	19	U	19	U
PCB-035	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-036	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-037	pg/L	NA	9.6	U	12	J	5.3	J	7.1	J
PCB-038	pg/L	NA	19	U	19	U	19	U	19	U
PCB-039	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-040 AND 071	pg/L	NA	13	U	190	J	49	J	49	J
PCB-041	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-042	pg/L	NA	5.8	J	160	J	40	J	43	J
PCB-043	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-044 AND 047 AND 065	pg/L	NA	110	J	820		250	J	290	J
PCB-045	pg/L	NA	5.3	J	46	J	29	J	31	J
PCB-046	pg/L	NA	3.8	J	48	J	13	J	12	J

Table D-27. PCB Congeners in Porewater – 2019 (continued)

Location Name			PW1-25		PW1-26		PW1-27			
Sample Name			PW1-25-190604		PW1-26-190604		PW1-27-190604		FD-190604-02	
Sample Collection Date			6/4/2019		6/4/2019		6/4/2019		6/4/2019	
Sample Type			N		N		P		FD	
Analyte	**Units**	**PAL**	**Result**		**Result**		**Result**		**Result**	
PCB-048	pg/L	NA	2.8	J	35	J	8.5	J	8.8	J
PCB-050 AND 053	pg/L	NA	15	J	110	J	27	J	31	J
PCB-051	pg/L	NA	51	J	190		67	J	72	J
PCB-052	pg/L	NA	79	J	1200		380		410	
PCB-054	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-055	pg/L	NA	9.6	U	2.9	J	9.6	U	1.5	J
PCB-056	pg/L	NA	2.4	U	41	J	15	J	15	J
PCB-057	pg/L	NA	9.6	U	9.7	U	2.4	J	2.4	J
PCB-058	pg/L	NA	19	U	18	J	7	J	5.8	J
PCB-059 AND 062 AND 075	pg/L	NA	3.2	J	79	J	16	J	15	J
PCB-060	pg/L	NA	19	U	19	U	19	U	19	U
PCB-061 AND 070 AND 074 AND 076	pg/L	NA	19	U	280	J	86	J	82	J
PCB-063	pg/L	NA	19	U	10	J	2.1	J	2.2	J
PCB-064	pg/L	NA	6.7	U	130	J	39	J	38	J
PCB-066	pg/L	NA	13	U	200		52	J	50	J
PCB-067	pg/L	NA	19	U	11	J	6.5	J	7.2	J
PCB-068	pg/L	NA	34	J	170	J	45	J	53	J
PCB-069 AND 049	pg/L	NA	32	J	810		200	J	210	J
PCB-072	pg/L	NA	19	U	14	J	4.6	J	4.7	J

Table D-27. PCB Congeners in Porewater – 2019 (continued)

Location Name			PW1-25		PW1-26		PW1-27			
Sample Name			PW1-25-190604		PW1-26-190604		PW1-27-190604		FD-190604-02	
Sample Collection Date			6/4/2019		6/4/2019		6/4/2019		6/4/2019	
Sample Type			N		N		P		FD	
Analyte	**Units**	**PAL**	**Result**		**Result**		**Result**		**Result**	
PCB-073	pg/L	NA	19	U	11	J	19	U	19	U
PCB-077	pg/L	NA	9.6	U	6.5	J	2.2	J	2.2	J
PCB-078	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-079	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-080	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-081	pg/L	NA	9.6	U	4.5	J	9.6	U	9.6	U
PCB-082	pg/L	NA	2.9	J	9.7	U	11	J	11	J
PCB-083	pg/L	NA	19	U	15	J	8.7	J	7	J
PCB-084	pg/L	NA	12	J	210		88	J	92	J
PCB-088 AND 091	pg/L	NA	7.2	J	200	J	44	J	44	J
PCB-089	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-092	pg/L	NA	7.3	J	95	J	47	J	43	J
PCB-093 AND 100	pg/L	NA	19	U	12	J	19	U	4.1	J
PCB-094	pg/L	NA	19	U	19	U	19	U	19	U
PCB-095	pg/L	NA	46	J	670		280		280	
PCB-096	pg/L	NA	19	U	5.5	J	2.1	J	19	U
PCB-098 AND 102	pg/L	NA	19	U	35	J	6.6	J	6.7	J
PCB-099	pg/L	NA	18	J	310		72	J	74	J
PCB-103	pg/L	NA	9.6	U	19	J	3.8	J	9.6	U
PCB-104	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U

Table D-27. PCB Congeners in Porewater – 2019 (continued)

Location Name			PW1-25		PW1-26		PW1-27			
Sample Name			PW1-25-190604		PW1-26-190604		PW1-27-190604		FD-190604-02	
Sample Collection Date			6/4/2019		6/4/2019		6/4/2019		6/4/2019	
Sample Type			N		N		P		FD	
Analyte	**Units**	**PAL**	**Result**		**Result**		**Result**		**Result**	
PCB-105	pg/L	NA	8.3	J	37		20		17	J
PCB-106	pg/L	NA	19	U	19	U	19	U	19	U
PCB-107 AND 124	pg/L	NA	19	U	19	U	19	U	19	U
PCB-108 AND 119 AND 086 AND 097 AND 125 AND 087	pg/L	NA	18	J	190	J	89	J	85	J
PCB-109	pg/L	NA	9.6	U	20	J	7.4	J	6.1	J
PCB-110 AND 115	pg/L	NA	37	J	490		190	J	190	J
PCB-111	pg/L	NA	19	U	19	U	19	U	19	U
PCB-112	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-113 AND 090 AND 101	pg/L	NA	35	J	490	J	160	J	160	J
PCB-114	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-117 AND 116 AND 085	pg/L	NA	5.3	J	24	J	20	J	20	J
PCB-118	pg/L	NA	23		250		75		68	
PCB-120	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-121	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-122	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-123	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-126	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-127	pg/L	NA	19	U	19	U	19	U	19	U
PCB-128 AND 166	pg/L	NA	2.6	U	20	J	8.5	J	7.3	J

Table D-27. PCB Congeners in Porewater – 2019 (continued)

Location Name			PW1-25		PW1-26		PW1-27			
Sample Name			PW1-25-190604		PW1-26-190604		PW1-27-190604		FD-190604-02	
Sample Collection Date			6/4/2019		6/4/2019		6/4/2019		6/4/2019	
Sample Type			N		N		P		FD	
Analyte	**Units**	**PAL**	**Result**		**Result**		**Result**		**Result**	
PCB-130	pg/L	NA	9.6	U	6.2	J	4.8	J	4.5	J
PCB-131	pg/L	NA	19	U	19	U	19	U	19	U
PCB-132	pg/L	NA	5.6	J	36	J	24	J	21	J
PCB-133	pg/L	NA	9.6	U	3	J	9.6	U	9.6	U
PCB-134 AND 143	pg/L	NA	1.1	J	8.1	J	4.7	J	4.8	J
PCB-136	pg/L	NA	2.2	U	32	J	12	J	12	J
PCB-137	pg/L	NA	19	U	3.8	J	2.1	J	19	U
PCB-138 AND 163 AND 129	pg/L	NA	17	J	120	J	57	J	48	J
PCB-139 AND 140	pg/L	NA	19	U	2.3	J	1.2	J	1.3	J
PCB-141	pg/L	NA	9.6	U	11	J	5.4	J	6.2	J
PCB-142	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-144	pg/L	NA	9.6	U	2.5	J	2.2	J	2	J
PCB-145	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-146	pg/L	NA	2.3	J	22	J	7.8	J	7.5	J
PCB-147 AND 149	pg/L	NA	13	J	150	J	51	J	48	J
PCB-148	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-150	pg/L	NA	19	U	19	U	19	U	19	U
PCB-151 AND 135	pg/L	NA	3.9	U	41	J	20	J	18	J
PCB-152	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-153 AND 168	pg/L	NA	14	U	120	J	42	J	36	J

Table D-27. PCB Congeners in Porewater – 2019 (continued)

Location Name			PW1-25		PW1-26		PW1-27			
Sample Name			PW1-25-190604		PW1-26-190604		PW1-27-190604		FD-190604-02	
Sample Collection Date			6/4/2019		6/4/2019		6/4/2019		6/4/2019	
Sample Type			N		N		P		FD	
Analyte	**Units**	**PAL**	**Result**		**Result**		**Result**		**Result**	
PCB-154	pg/L	NA	9.6	U	4.7	J	1.4	J	9.6	U
PCB-155	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-156 AND 157	pg/L	NA	2.6	J	11	J	5.7	J	3.7	J
PCB-158	pg/L	NA	2	J	11	J	5.8	J	3.9	J
PCB-159	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-160	pg/L	NA	19	U	19	U	19	U	19	U
PCB-161	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-162	pg/L	NA	19	U	19	U	19	U	19	U
PCB-164	pg/L	NA	0.72	J	7.8	J	3.8	J	3.1	J
PCB-165	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-167	pg/L	NA	1.4	J	5.2	J	2.2	J	1.5	J
PCB-169	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-170	pg/L	NA	19	U	8.1	J	19	U	2	J
PCB-171 AND 173	pg/L	NA	19	U	2.2	J	19	U	19	U
PCB-172	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-174	pg/L	NA	0.96	J	4.7	J	1.9	J	3.1	J
PCB-175	pg/L	NA	19	U	19	U	19	U	19	U
PCB-176	pg/L	NA	9.6	U	1	J	9.6	U	9.6	U
PCB-177	pg/L	NA	19	U	4.9	J	1.7	J	1.2	J
PCB-178	pg/L	NA	9.6	U	9.7	U	1.7	J	9.6	U

Table D-27. PCB Congeners in Porewater – 2019 (continued)

Location Name			PW1-25		PW1-26		PW1-27			
Sample Name			PW1-25-190604		PW1-26-190604		PW1-27-190604		FD-190604-02	
Sample Collection Date			6/4/2019		6/4/2019		6/4/2019		6/4/2019	
Sample Type			N		N		P		FD	
Analyte	**Units**	**PAL**	**Result**		**Result**		**Result**		**Result**	
PCB-179	pg/L	NA	19	U	3.1	J	1.6	J	19	U
PCB-180 AND 193	pg/L	NA	38	U	14	J	7.1	J	5.8	J
PCB-181	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-182	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-183	pg/L	NA	1.6	U	5.5	J	2.1	J	1.9	J
PCB-184	pg/L	NA	19	U	19	U	19	U	19	U
PCB-185	pg/L	NA	19	U	19	U	19	U	19	U
PCB-186	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-187	pg/L	NA	19	U	9.3	J	6.3	J	19	U
PCB-188	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-189	pg/L	NA	9.6	U	0.78	J	9.6	U	9.6	U
PCB-190	pg/L	NA	19	U	19	U	19	U	19	U
PCB-191	pg/L	NA	19	U	19	U	19	U	19	U
PCB-192	pg/L	NA	19	U	19	U	19	U	19	U
PCB-194	pg/L	NA	19	U	2.6	J	1.4	J	19	U
PCB-195	pg/L	NA	19	U	19	U	19	U	19	U
PCB-196	pg/L	NA	19	U	0.91	J	1.1	J	19	U
PCB-197	pg/L	NA	19	U	19	U	19	U	19	U
PCB-198 AND 199	pg/L	NA	19	U	1.6	J	0.98	J	0.87	J
PCB-200	pg/L	NA	19	U	19	U	19	U	19	U

Table D-27. PCB Congeners in Porewater – 2019 (continued)

Location Name			PW1-25		PW1-26		PW1-27			
Sample Name			PW1-25-190604		PW1-26-190604		PW1-27-190604		FD-190604-02	
Sample Collection Date			6/4/2019		6/4/2019		6/4/2019		6/4/2019	
Sample Type			N		N		P		FD	
Analyte	**Units**	**PAL**	**Result**		**Result**		**Result**		**Result**	
PCB-201	pg/L	NA	19	U	19	U	19	U	19	U
PCB-202	pg/L	NA	9.6	U	0.55	J	9.6	U	9.6	U
PCB-203	pg/L	NA	19	U	1.6	J	0.76	J	1.1	J
PCB-204	pg/L	NA	19	U	19	U	19	U	19	U
PCB-205	pg/L	NA	9.6	U	9.7	U	9.6	U	9.6	U
PCB-206	pg/L	NA	9.6	U	1	J	2.5	J	0.91	J
PCB-207	pg/L	NA	9.6	U	9.7	U	0.29	J	9.6	U
PCB-208	pg/L	NA	9.6	U	9.7	U	0.39	J	9.6	U
PCB-209	pg/L	NA	0.61	U	1.1	U	2.7	J	0.92	U
TOTAL PCBs	pg/L	7	**960**		**10,945**		**4,480**		**4,532**	

Notes:
*PAL not established in SAP (U.S. Navy, 2018); PAL used is EPA Human Health Surface Water Criteria (40 CFR 131.45)
FD – Field duplicate
J - The reported value is an estimated concentration.
N – Sample is not part of a field duplicate pair
NA - Not applicable
P – Parent sample of field duplicate
PAL - Project Action Limit
PCB - polychlorinated biphenyls
U - The analyte was not detected at or above the limit of detection (LOD). (sometimes validators will elevate the limit due to the "B" qualifier using the 5x/10x rule so this definition is different than the lab description).
Bolded values indicate that the reported concentration exceeds the PAL.
pg/L - picograms per liter

Table D-28. Total PCBs (Congeners) in Porewater - 2019

Location Name	Sample Name	Sample type	Total PCBs (Sum of congeners with ND as null) Result (pg/L)	Total number of PCB congeners detected
Surface Water Criterion[1]			**7**	**--**
PW1-25	PW1-25-190604	N	**960**	69
PW1-26	PW1-26-190604	N	**10,945**	129
PW1-27	PW1-27-190604	N	**4,480**	124

Notes:
[1] EPA Human Health Surface Water Criteria (40 CFR 131.45)
All samples analyzed using analytical method 1668C.
N – Sample is not part of a field duplicate pair
PCB - polychlorinated biphenyl
Bolded values indicate that the reported concentration exceeds the PAL.
pg/L - picograms per liter

Table D-29. Target VOCs in Surface Water - 2019

Location Name			SW1-13	SW1-14	SW1-15	SW1-16	SW1-17	
Sample Name			SW1-13-190604	SW1-14-190603	SW1-15-190603	SW1-16-190603	SW1-17-190603	FD-190603-02
Sample Collection Date			6/4/2019	6/3/2019	6/3/2019	6/3/2019	6/3/2019	6/3/2019
Sample Type			N	N	N	N	P	FD
Analyte	**Units**	**PAL [a]**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
1,2-Dichloroethane	µg/L	8.9	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Tetrachloroethene	µg/L	2.4	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
cis-1,2-Dichloroethene	µg/L	200	140	2.5	2.5	2.3	2.2 J	2.4
trans-1,2-Dichloroethene	µg/L	200	1	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,1,1-Trichloroethane	µg/L	20,000	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Chloroethane	µg/L	700	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl Chloride	µg/L	0.02	**9.3**	**0.14**	**0.18**	**0.13**	**0.093**	**0.13**
1,1-Dichloroethane	µg/L	700	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,1-Dichloroethene	µg/L	700	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	µg/L	0.3	**10**	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U

Notes:
[a] PALs updated from 2018 SAP (U.S. Navy, 2018) and are based on EPA Human Health Surface Water Criteria (40 CFR 131.45). Surrogates were used for cis-1,2-dichloroethene, chloroethane, 1,1-dichloroethane. State of Washington surface water criteria was used for vinyl chloride.
FD - Duplicate
J - The reported value is an estimated concentration. N - Sample is not part of a field duplicate pair. P - Parent Sample of field duplicate
PAL - Project Action Limit
U - The analyte was not detected at or above the stated limit. (Sometimes validators will elevate the limit due to the "B" qualifier using the 5x/10x rule so this definition is different than the lab description).
Underlined values represent analytes not detected at or above the stated limit, which exceeds the PAL.
Bolded values indicate that the reported concentration exceeds the PAL.
µg/L - micrograms per liter

Table D-30. PCB Congeners in Surface Water – 2019

Location Name			SW1-18		SW1-19	SW1-20
Sample Name			SW1-18-190603	FD-190603-01	SW1-19-190603	SW1-20-190603
Sample Collection Date			6/3/2019	6/3/2019	6/3/2019	6/3/2019
Sample Type			P	FD	N	N
Analyte	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**
PCB-001	pg/L	NA	14 J	12 J	300	11 J
PCB-002	pg/L	NA	19 U	20 U	23 J	20 U
PCB-003	pg/L	NA	1.9 J	1.5 J	100 J	1.9 J
PCB-004	pg/L	NA	120 J	130 J	4,200	130 J
PCB-005	pg/L	NA	24 U	25 U	23 U	25 U
PCB-006	pg/L	NA	49 J	46 J	1,700	47 J
PCB-007	pg/L	NA	24 U	25 U	31 J	25 U
PCB-008	pg/L	NA	88 J	78 J	1,800	80 J
PCB-009	pg/L	NA	48 U	50 U	54 J	51 U
PCB-010	pg/L	NA	48 U	50 U	110 J	51 U
PCB-011	pg/L	NA	24 U	25 U	51 J	16 J
PCB-012 AND 013	pg/L	NA	38 U	40 U	150 J	11 J
PCB-014	pg/L	NA	24 U	25 U	23 U	25 U
PCB-015	pg/L	NA	30 J	29 J	560	28 J
PCB-016	pg/L	NA	38 J	40 J	560	41 J
PCB-017	pg/L	NA	56 J	51 J	670	51 J
PCB-019	pg/L	NA	24 J	24 J	600	24 J
PCB-021 AND 033	pg/L	NA	40 J	38 J	160 J	30 J
PCB-022	pg/L	NA	21 J	17 J	160 J	17 J
PCB-023	pg/L	NA	19 U	20 U	19 U	20 U

Table D-30. PCB Congeners in Surface Water – 2019 (continued)

Location Name			SW1-18		SW1-19	SW1-20
Sample Name			SW1-18-190603	FD-190603-01	SW1-19-190603	SW1-20-190603
Sample Collection Date			6/3/2019	6/3/2019	6/3/2019	6/3/2019
Sample Type			P	FD	N	N
Analyte	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**
PCB-024	pg/L	NA	19 U	2.6 J	13 J	1.9 J
PCB-025	pg/L	NA	19 J	15 J	220	15 J
PCB-026 AND 029	pg/L	NA	46 J	39 J	440	46 J
PCB-027	pg/L	NA	19 J	17 J	410	17 J
PCB-028 AND 020	pg/L	NA	100 J	97 J	640	94 J
PCB-030 AND 018	pg/L	NA	110 J	100 J	1,700	110 J
PCB-031	pg/L	NA	80 J	76 J	460	77 J
PCB-032	pg/L	NA	23 J	22 J	350	23 J
PCB-034	pg/L	NA	19 U	20 U	9.3 J	20 U
PCB-035	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-036	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-037	pg/L	NA	8.7 J	8 J	50 J	7.8 J
PCB-038	pg/L	NA	19 U	20 U	19 U	20 U
PCB-039	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-040 AND 071	pg/L	NA	18 J	19 J	120 J	20 J
PCB-041	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-042	pg/L	NA	10 J	11 J	80 J	12 J
PCB-043	pg/L	NA	1.1 J	9.9 U	12 J	10 U
PCB-044 AND 047 AND 065	pg/L	NA	52 J	53 J	350 J	54 J
PCB-045	pg/L	NA	11 J	9.6 J	72 J	10 J

Table D-30. PCB Congeners in Surface Water – 2019 (continued)

Location Name			SW1-18		SW1-19	SW1-20
Sample Name			SW1-18-190603	FD-190603-01	SW1-19-190603	SW1-20-190603
Sample Collection Date			6/3/2019	6/3/2019	6/3/2019	6/3/2019
Sample Type			P	FD	N	N
Analyte	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**
PCB-046	pg/L	NA	4.9 J	3.9 J	67 J	4.6 J
PCB-048	pg/L	NA	10 J	11 J	40 J	9.5 J
PCB-050 AND 053	pg/L	NA	15 J	17 J	220 J	19 J
PCB-051	pg/L	NA	3 J	3.7 J	32 J	3.3 J
PCB-052	pg/L	NA	94 J	97 J	670	100 J
PCB-054	pg/L	NA	9.5 U	9.9 U	7.5 J	10 U
PCB-055	pg/L	NA	9.5 U	9.9 U	1.5 J	10 U
PCB-056	pg/L	NA	6.3 J	5.9 J	28 J	6.2 J
PCB-057	pg/L	NA	9.5 U	1.9 J	2.1 J	10 U
PCB-058	pg/L	NA	19 U	20 U	19 U	1.2 J
PCB-059 AND 062 AND 075	pg/L	NA	6.3 J	6.1 J	59 J	7.1 J
PCB-060	pg/L	NA	3.2 J	3.2 J	7.5 J	3.6 J
PCB-061 AND 070 AND 074 AND 076	pg/L	NA	39 J	41 J	160 J	39 J
PCB-063	pg/L	NA	1.6 J	20 U	5.3 J	20 U
PCB-064	pg/L	NA	14 J	15 J	90 J	15 J
PCB-066	pg/L	NA	28 J	30 J	90 J	29 J
PCB-067	pg/L	NA	19 U	1.3 J	7.4 J	1.1 J
PCB-068	pg/L	NA	19 U	1.2 U	3.7 U	20 U
PCB-069 AND 049	pg/L	NA	43 J	44 J	310 J	47 J
PCB-072	pg/L	NA	19 U	1.3 J	5.6 J	0.97 J

Table D-30. PCB Congeners in Surface Water – 2019 (continued)

Location Name			SW1-18		SW1-19	SW1-20
Sample Name			SW1-18-190603	FD-190603-01	SW1-19-190603	SW1-20-190603
Sample Collection Date			6/3/2019	6/3/2019	6/3/2019	6/3/2019
Sample Type			P	FD	N	N
Analyte	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**
PCB-073	pg/L	NA	19 U	1.1 J	19 U	1.2 J
PCB-077	pg/L	NA	2.7 J	2.1 J	7.1 J	2.3 J
PCB-078	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-079	pg/L	NA	9.5 U	1.1 J	9.3 U	10 U
PCB-080	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-081	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-082	pg/L	NA	3.7 J	4 J	12 J	3.2 J
PCB-083	pg/L	NA	1.8 J	20 U	7.3 J	2.8 J
PCB-084	pg/L	NA	14 J	14 J	77 J	14 J
PCB-088 AND 091	pg/L	NA	8.5 J	9.5 J	36 J	9.3 J
PCB-089	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-092	pg/L	NA	10 J	8.7 J	37 J	11 J
PCB-093 AND 100	pg/L	NA	19 U	20 U	3.5 J	20 U
PCB-094	pg/L	NA	19 U	20 U	19 U	20 U
PCB-095	pg/L	NA	50 J	59 J	220	53 J
PCB-096	pg/L	NA	19 U	20 U	3.1 J	0.36 J
PCB-098 AND 102	pg/L	NA	1.5 J	20 U	8.6 J	2.8 J
PCB-099	pg/L	NA	29 J	34 J	80 J	27 J
PCB-103	pg/L	NA	9.5 U	9.9 U	3.4 J	10 U
PCB-104	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U

Table D-30. PCB Congeners in Surface Water – 2019 (continued)

Location Name			SW1-18		SW1-19	SW1-20
Sample Name			SW1-18-190603	FD-190603-01	SW1-19-190603	SW1-20-190603
Sample Collection Date			6/3/2019	6/3/2019	6/3/2019	6/3/2019
Sample Type			P	FD	N	N
Analyte	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**
PCB-105	pg/L	NA	16 J	20	32	16 J
PCB-106	pg/L	NA	19 U	20 U	19 U	20 U
PCB-107 AND 124	pg/L	NA	19 U	20 U	19 U	20 U
PCB-108 AND 119 AND 086 AND 097 AND 125 AND 087	pg/L	NA	29 J	32 J	85 J	30 J
PCB-109	pg/L	NA	2.3 J	3.5 J	6.2 J	2.9 J
PCB-110 AND 115	pg/L	NA	53 J	60 J	160 J	55 J
PCB-111	pg/L	NA	19 U	20 U	19 U	20 U
PCB-112	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-113 AND 090 AND 101	pg/L	NA	53 J	61 J	150 J	58 J
PCB-114	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-117 AND 116 AND 085	pg/L	NA	9.2 U	11 U	21 J	11 U
PCB-118	pg/L	NA	46	55	99	52
PCB-120	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-121	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-122	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-123	pg/L	NA	9.5 U	9.9 U	2.6 J	1.1 J
PCB-126	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-127	pg/L	NA	19 U	20 U	19 U	20 U
PCB-128 AND 166	pg/L	NA	7.6 J	8.5 J	14 J	8.6 J

Table D-30. PCB Congeners in Surface Water – 2019 (continued)

Location Name			SW1-18		SW1-19	SW1-20
Sample Name			SW1-18-190603	FD-190603-01	SW1-19-190603	SW1-20-190603
Sample Collection Date			6/3/2019	6/3/2019	6/3/2019	6/3/2019
Sample Type			P	FD	N	N
Analyte	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**
PCB-130	pg/L	NA	3.4 J	3.6 J	5 J	3.2 J
PCB-131	pg/L	NA	19 U	1 J	1 J	0.89 J
PCB-132	pg/L	NA	10 J	15 J	23 J	11 J
PCB-133	pg/L	NA	9.5 U	9.9 U	1 J	10 U
PCB-134 AND 143	pg/L	NA	2.2 J	2 J	4.1 J	1.2 J
PCB-136	pg/L	NA	2.8 J	5 J	11 J	3.8 J
PCB-137	pg/L	NA	1.9 J	2.1 J	3.8 J	2.3 J
PCB-138 AND 163 AND 129	pg/L	NA	47 J	57 J	80 J	55 J
PCB-139 AND 140	pg/L	NA	19 U	1 J	1.4 J	0.96 J
PCB-141	pg/L	NA	4.6 J	4.9 J	8.7 J	5.1 J
PCB-142	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-144	pg/L	NA	9.5 U	1.3 J	2.8 J	1.1 J
PCB-145	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-146	pg/L	NA	5.4 J	5.8 J	9.6 J	5.1 J
PCB-147 AND 149	pg/L	NA	23 J	27 J	52 J	26 J
PCB-148	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-150	pg/L	NA	19 U	20 U	19 U	20 U
PCB-151 AND 135	pg/L	NA	7.9 J	8.5 J	19 J	6.7 J
PCB-152	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-153 AND 168	pg/L	NA	31 J	35 J	53 J	31 J

Table D-30. PCB Congeners in Surface Water – 2019 (continued)

Location Name			SW1-18		SW1-19	SW1-20
Sample Name			SW1-18-190603	FD-190603-01	SW1-19-190603	SW1-20-190603
Sample Collection Date			6/3/2019	6/3/2019	6/3/2019	6/3/2019
Sample Type			P	FD	N	N
Analyte	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**
PCB-154	pg/L	NA	9.5 U	1.1 J	1.2 J	1 J
PCB-155	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-156 AND 157	pg/L	NA	6.3 J	7.8 J	12 J	5.3 J
PCB-158	pg/L	NA	4.5 J	5.8 J	7.6 J	5.5 J
PCB-159	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-160	pg/L	NA	19 U	20 U	19 U	20 U
PCB-161	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-162	pg/L	NA	19 U	20 U	19 U	20 U
PCB-164	pg/L	NA	2.5 J	2.6 J	5 J	2.8 J
PCB-165	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-167	pg/L	NA	2.3 J	2.5 J	3.7 J	2.2 J
PCB-169	pg/L	NA	9.5 U	9.9 U	0.7 J	10 U
PCB-170	pg/L	NA	4.2 J	5.5 J	7.6 J	3.5 J
PCB-171 AND 173	pg/L	NA	19 U	2 J	19 U	1.4 J
PCB-172	pg/L	NA	9.5 U	9.9 U	1.1 J	10 U
PCB-174	pg/L	NA	2.2 J	1.9 J	4.7 J	2.2 J
PCB-175	pg/L	NA	19 U	20 U	19 U	20 U
PCB-176	pg/L	NA	9.5 U	9.9 U	9.3 U	0.48 J
PCB-177	pg/L	NA	2 J	1.2 J	3.6 J	2.1 J
PCB-178	pg/L	NA	9.5 U	9.9 U	1.4 J	10 U

Table D-30. PCB Congeners in Surface Water – 2019 (continued)

Location Name			SW1-18		SW1-19	SW1-20
Sample Name			SW1-18-190603	FD-190603-01	SW1-19-190603	SW1-20-190603
Sample Collection Date			6/3/2019	6/3/2019	6/3/2019	6/3/2019
Sample Type			P	FD	N	N
Analyte	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**
PCB-179	pg/L	NA	1.2 J	1.5 J	2 J	0.65 J
PCB-180 AND 193	pg/L	NA	5.3 J	6.2 J	11 J	5.2 J
PCB-181	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-182	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-183	pg/L	NA	2.9 U	3.3 U	4.9 U	2.4 U
PCB-184	pg/L	NA	19 U	20 U	19 U	20 U
PCB-185	pg/L	NA	19 U	20 U	19 U	20 U
PCB-186	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-187	pg/L	NA	4.1 J	3 J	6.9 J	3.4 J
PCB-188	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-189	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-190	pg/L	NA	19 U	0.87 J	1 J	20 U
PCB-191	pg/L	NA	19 U	20 U	19 U	20 U
PCB-192	pg/L	NA	19 U	20 U	19 U	20 U
PCB-194	pg/L	NA	19 U	0.99 J	2.1 J	0.92 J
PCB-195	pg/L	NA	19 U	1.3 J	0.98 J	20 U
PCB-196	pg/L	NA	0.52 J	20 U	19 U	0.54 J
PCB-197	pg/L	NA	19 U	20 U	19 U	20 U
PCB-198 AND 199	pg/L	NA	0.71 U	1 U	2.1 U	0.87 U
PCB-200	pg/L	NA	19 U	0.21 J	19 U	0.29 J

Table D-30. PCB Congeners in Surface Water – 2019 (continued)

Location Name			SW1-18		SW1-19	SW1-20
Sample Name			SW1-18-190603	FD-190603-01	SW1-19-190603	SW1-20-190603
Sample Collection Date			6/3/2019	6/3/2019	6/3/2019	6/3/2019
Sample Type			P	FD	N	N
Analyte	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**
PCB-201	pg/L	NA	19 U	20 U	0.62 J	20 U
PCB-202	pg/L	NA	9.5 U	9.9 U	9.3 U	0.43 U
PCB-203	pg/L	NA	0.71 J	0.47 J	1 J	1.1 J
PCB-204	pg/L	NA	19 U	20 U	19 U	20 U
PCB-205	pg/L	NA	9.5 U	9.9 U	0.77 J	10 U
PCB-206	pg/L	NA	1.2 J	1.1 J	1.9 J	0.68 J
PCB-207	pg/L	NA	9.5 U	9.9 U	9.3 U	10 U
PCB-208	pg/L	NA	9.5 U	9.9 U	0.4 J	10 U
PCB-209	pg/L	NA	1.9 U	1.4 U	2.3 U	2 U
TOTAL PCBs	pg/L	7	**1,752**	**1,807**	**19,376**	**1,805**

Notes:
*PAL not established in SAP (U.S. Navy, 2018); PAL used is EPA Human Health Surface Water Criteria (40 CFR 131.45)
FD – Field duplicate
P – Parent sample of field duplicate
N – Sample is not part of a field duplicate pair
J - The reported value is an estimated concentration.
U - The analyte was not detected at or above the limit of detection (LOD). (sometimes validators will elevate the limit due to the "B" qualifier using the 5x/10x rule so this definition is different than the lab description).
PCB - polychlorinated biphenyls
NA - Not applicable; NE - Not established
Bolded values indicate that the reported concentration exceeds the PAL.
pg/L - picograms per liter

Table 31. Total PCBs (Congeners) in Surface Water - 2019

Location Name	Sample Name	Sample type	Total PCBs (Sum of congeners with ND as null) Result (pg/L)	Total number of PCB congeners detected
Surface Water Criterion[1]			7	--
SW1-18	SW1-18-190603	P	**1,752**	110
SW1-18 (dup)	FD-190603-01	FD	**1,807**	125
SW1-19	SW1-19-190603	N	**19,376**	146
SW1-20	SW1-20-190603	N	**1,805**	128

Notes:
[1] EPA Human Health Surface Water Criteria (40 CFR 131.45)
FD – Field duplicate
N – Sample is not part of a field duplicate pair
P – Parent sample of field duplicate
PCB - polychlorinated biphenyl
Bolded values indicate that the reported concentration exceeds the PAL.
pg/L - picograms per liter

Table D-32. PCB Aroclors in Sediment - 2019

		Location Name	MA-19	MA-21	MA22	MA-23		TF-18	TF-20	TF-21
		Sample Name	SED-MA19-190604	SED-MA21-190604	SED-MA22-190604	SED-MA23-190604	FD-190604-01	SED-TF18-190605	SED-TF20-190604	SED-TF21-190604
		Sample Collection Date	6/4/2019	6/4/2019	6/4/2019	6/4/2019	6/4/2019	6/4/2019	6/4/2019	6/4/2019
		Sample Type	N	N	N	P	FD	N	N	N
Analyte	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
AROCLOR-1016	µg/kg	NA	99 U	98 U	97 U	98 U	99 U	97 U	98 U	96 U
AROCLOR-1221	µg/kg	NA	150 U	150 U	140 U	150 U	150 U	140 U	150 U	140 U
AROCLOR-1232	µg/kg	NA	200 U	200 U	190 U	200 U	200 U	190 U	200 U	190 U
AROCLOR-1242	µg/kg	NA	200 U	200 U	190 U	200 U	200 U	190 U	200 U	190 U
AROCLOR-1248	µg/kg	NA	150 U	150 U	140 U	150 U	150 U	140 U	150 U	140 U
AROCLOR-1254	µg/kg	NA	99 U	98 U	55 J	70 J	52 J	97 U	98 U	96 U
AROCLOR-1260	µg/kg	NA	99 U	98 U	97 U	98 U	99 U	97 U	98 U	96 U
AROCLOR-1262	µg/kg	NA	200 U	200 U	190 U	200 U	200 U	190 U	200 U	190 U
AROCLOR-1268	µg/kg	NA	200 U	200 U	190 U	200 U	200 U	190 U	200 U	190 U
Total PCBs (Aroclor)[1]	µg/kg	12,000	200 U	200 U	55 J	70 J	52 J	190 U	200 U	190 U

Notes:
[1] Total PCB (Aroclor) are derived based on the sum of the concentrations of Aroclors® 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262, and 1268.
When all chemicals in a group are undetected, only the single highest individual chemical quantitation limit in a group should be reported and appropriately qualified. If some concentrations were detected and others were not, only the detected concentrations are included in the sum.
FD – Field duplicate
J - The reported value is an estimated concentration.
N – Sample is not part of a field duplicate pair
P – Parent Sample of field duplicate
U - The analyte was analyzed but not detected at or above LOD. (sometimes validators will elevate the limit due to the "B" qual using the 5x/10x rule so this definition is different than the lab description).
Bolded values indicate that the reported concentration exceeds the PAL.
µg/kg - micrograms per kilogram

Table D-33. PCB Congeners in Sediment – 2019

		Location Name	MA-19	MA-21	MA22	MA-23		TF-18	TF-20	TF-21
		Sample Name	SED-MA19-190604	SED-MA21-190604	SED-MA22-190604	SED-MA23-190604	FD-190604-01	SED-TF18-190605	SED-TF20-190604	SED-TF21-190604
		Sample Collection Date	6/4/2019	6/4/2019	6/4/2019	6/4/2019	6/4/2019	6/5/2019	6/4/2019	6/4/2019
		Sample Type	N	N	N	P	FD	N	N	N
Analyte	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
PCB-001	pg/g	NA	39	6.4 J	51	19 J	21	6.5 J	4.1 J	9.7 J
PCB-002	pg/g	NA	28	38	110	68	80	52	34	81
PCB-003	pg/g	NA	1.7 J	4 J	34	19 J	16 J	6.8 J	2.7 J	8.8 J
PCB-004	pg/g	NA	100	36	280	110	140	8 J	2.5 J	19 J
PCB-005	pg/g	NA	5 U	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U	5 U
PCB-006	pg/g	NA	8.4 J	31	280	100	140	4.9 J	4.9 U	27
PCB-007	pg/g	NA	5 U	4.9 U	13 J	4.9 U	4.9 U	4.9 U	4.9 U	5.2 J
PCB-008	pg/g	NA	14 J	50	440	170	200	25	8.2 J	54
PCB-009	pg/g	NA	5 U	4.9 U	11 J	4.9 U	4.9 U	4.9 U	4.9 U	5 U
PCB-010	pg/g	NA	3.4 J	4.9 U	12 J	6 J	7.1 J	4.9 U	4.9 U	5 U
PCB-011	pg/g	NA	9.1 J	20 U	45	27	31	18 J	9.6 J	28
PCB-012 AND 013	pg/g	NA	5 J	9.8 U	72	37 J	42	4.4 J	9.8 U	12 J
PCB-014	pg/g	NA	5 U	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U	5 U
PCB-015	pg/g	NA	29	87	490	250	300	35	14 J	65
PCB-016	pg/g	NA	8.6 J	35	220	94	120	4.8 J	2 U	17 J
PCB-017	pg/g	NA	11 J	49	310	150	180	14 J	4.4 J	38
PCB-019	pg/g	NA	3.3 J	20	110	51	64	2 J	2 U	13 J
PCB-021 AND 033	pg/g	NA	14 J	33 J	180	89	94	18 J	5.6 J	46
PCB-022	pg/g	NA	10 J	32	150	75	88	8.9 J	3.1 J	20
PCB-023	pg/g	NA	0.99 U	0.98 U	0.99 U	0.99 U	0.99 U	0.98 U	0.98 U	1 U
PCB-024	pg/g	NA	0.99 U	0.98 U	0.99 U	0.99 U	0.99 U	0.98 U	0.98 U	1 U
PCB-025	pg/g	NA	16 J	41	250	140	160	8.7 J	2.6 J	51
PCB-026 AND 029	pg/g	NA	39 J	78	530	320	360	12 J	3.9 J	110
PCB-027	pg/g	NA	6.4 J	29	170	84	100	5.1 J	0.98 U	49
PCB-028 AND 020	pg/g	NA	63	170	850	450	520	67	23 J	140
PCB-030 AND 018	pg/g	NA	21 J	92	620	270	370	13 J	3.6 J	63
PCB-031	pg/g	NA	54	140	720	390	430	41	13 J	110
PCB-032	pg/g	NA	7.2 J	29	200	110	130	21	5.2 J	38
PCB-034	pg/g	NA	0.99 U	0.98 U	0.99 U	0.99 U	0.99 U	0.98 U	0.98 U	1 U
PCB-035	pg/g	NA	1.1 J	0.98 U	0.99 U	0.99 U	0.99 U	3 J	0.95 J	4.4 J
PCB-036	pg/g	NA	0.99 U	0.98 U	0.99 U	0.99 U	0.99 U	0.98 U	0.98 U	1 U

Table D-33. PCB Congeners in Sediment – 2019 (continued)

Location Name			MA-19	MA-21	MA22	MA-23		TF-18	TF-20	TF-21
Sample Name			SED-MA19-190604	SED-MA21-190604	SED-MA22-190604	SED-MA23-190604	FD-190604-01	SED-TF18-190605	SED-TF20-190604	SED-TF21-190604
Sample Collection Date			6/4/2019	6/4/2019	6/4/2019	6/4/2019	6/4/2019	6/5/2019	6/4/2019	6/4/2019
Sample Type			N	N	N	P	FD	N	N	N
Analyte	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
PCB-037	pg/g	NA	17 J	35	140	83	100	29	10 J	40
PCB-038	pg/g	NA	0.99 U	0.98 U	0.99 U	0.99 U	0.99 U	0.98 U	0.98 U	1 U
PCB-039	pg/g	NA	0.99 U	0.98 U	0.99 U	0.99 U	0.99 U	0.98 U	0.98 U	1 U
PCB-040 AND 071	pg/g	NA	24 J	42	390	240	270	15 J	3.6 J	96
PCB-041	pg/g	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
PCB-042	pg/g	NA	9.8 J	27	170	100	120	11 J	2.6 J	34
PCB-043	pg/g	NA	1.4 J	4.4 J	36	13 J	19 J	1.1 J	0.98 U	4.7 J
PCB-044 AND 047 AND 065	pg/g	NA	56 J	120	870	570	630	51 J	11 J	190
PCB-045	pg/g	NA	4 J	13 J	78	46	51	1.7 U	0.57 U	9.2 J
PCB-046	pg/g	NA	2.3 J	8.9 J	49	26	32	1.3 J	0.98 U	7.9 J
PCB-048	pg/g	NA	4.7 J	10 J	63	37	42	4.6 J	1.2 J	13 J
PCB-050 AND 053	pg/g	NA	12 J	32 J	220	140	160	6.7 J	1.9 J	63
PCB-051	pg/g	NA	2.1 J	4.5 J	35	22	26	3 J	0.8 J	11 J
PCB-052	pg/g	NA	120	220	1,800	1,200	1,400	83	16 J	480
PCB-054	pg/g	NA	0.99 U	0.98 U	3.9 J	2.5 J	3.2 J	0.98 U	0.98 U	3.5 J
PCB-055	pg/g	NA	0.99 U	0.98 U	0.99 U	0.99 U	0.99 U	0.98 U	0.98 U	1 U
PCB-056	pg/g	NA	13 J	24	140	92	100	19 J	4.8 J	36
PCB-057	pg/g	NA	0.99 U	0.98 U	0.99 U	0.99 U	0.99 U	0.98 U	0.98 U	1 U
PCB-058	pg/g	NA	1.4 J	2.9 J	22	22	24	1.2 J	0.98 U	4.9 J
PCB-059 AND 062 AND 075	pg/g	NA	5.8 J	13 J	100	62	69	4.4 J	1 J	26 J
PCB-060	pg/g	NA	6.8 J	9.2 J	57	36	43	11 J	3.1 J	17 J
PCB-061 AND 070 AND 074 AND 076	pg/g	NA	58 J	110	870	370	540	80	18 J	190
PCB-063	pg/g	NA	1.2 J	2.2 J	17 J	7.6 J	9.5 J	1.7 J	0.4 J	3.4 J
PCB-064	pg/g	NA	13 J	30	190	120	140	13 J	3 J	39
PCB-066	pg/g	NA	58	93	730	360	440	80	18 J	170
PCB-067	pg/g	NA	1 J	2 J	17 J	7.4 J	8.9 J	1.2 J	0.98 U	2 J
PCB-068	pg/g	NA	1.4 J	2 J	15 J	11 J	11 J	1.7 J	0.45 U	4.9 J
PCB-069 AND 049	pg/g	NA	63	120	990	690	710	56	12 J	290
PCB-072	pg/g	NA	2 J	2.8 J	26	19 J	18 J	2.2 J	0.42 J	7.4 J

Table D-33. PCB Congeners in Sediment – 2019 (continued)

		Location Name	MA-19		MA-21		MA22		MA-23				TF-18		TF-20		TF-21	
		Sample Name	SED-MA19-190604		SED-MA21-190604		SED-MA22-190604		SED-MA23-190604		FD-190604-01		SED-TF18-190605		SED-TF20-190604		SED-TF21-190604	
		Sample Collection Date	6/4/2019		6/4/2019		6/4/2019		6/4/2019		6/4/2019		6/5/2019		6/4/2019		6/4/2019	
		Sample Type	N		N		N		P		FD		N		N		N	
Analyte	**Units**	**PAL**	**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
PCB-073	pg/g	NA	0.99	U	0.98	U	0.99	U	0.99	U	0.99	U	0.98	U	0.98	U	1	U
PCB-077	pg/g	NA	12		15		89		71		74		25		7.3		41	
PCB-078	pg/g	NA	0.99	U	0.98	U	0.99	U	0.99	U	0.99	U	0.98	U	0.98	U	1	U
PCB-079	pg/g	NA	1.8	J	6.2	J	19	J	19	J	22		1.9	J	0.98	U	5.6	J
PCB-080	pg/g	NA	0.94	J	1.9	J	9.7	J	13	J	13	J	1.1	J	0.98	U	3	J
PCB-081	pg/g	NA	0.99	U	0.98	U	0.99	U	0.99	U	0.99	U	0.98	U	0.98	U	1	U
PCB-082	pg/g	NA	13	J	24		170		200		210		14	J	2.5	J	42	
PCB-083	pg/g	NA	6	J	21		77		89		96		6.7	J	2.1	J	28	
PCB-084	pg/g	NA	25		56		460		220		460		21		3.2	J	95	
PCB-088 AND 091	pg/g	NA	16	J	31	J	300		2	U	240		16	J	2.5	J	61	
PCB-089	pg/g	NA	0.99	U	0.98	U	0.99	U	0.99	U	0.99	U	0.98	U	0.98	U	1	U
PCB-092	pg/g	NA	32		58		410		470		500		40		7.3	J	110	
PCB-093 AND 100	pg/g	NA	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
PCB-094	pg/g	NA	0.99	U	0.98	U	0.99	U	0.99	U	0.99	U	0.98	U	0.98	U	1	U
PCB-095	pg/g	NA	56		110		840		850		980		48		10	J	200	
PCB-096	pg/g	NA	0.59	J	1.3	J	13	J	11	J	12	J	0.71	J	0.17	J	3.3	J
PCB-098 AND 102	pg/g	NA	2	U	3.9	J	39		28	J	38	J	2	U	2	U	10	J
PCB-099	pg/g	NA	130		180		1,500		1,400		1,400		160		31		440	
PCB-103	pg/g	NA	0.99	U	0.98	U	0.99	U	0.99	U	0.99	U	0.98	U	0.98	U	7.5	J
PCB-104	pg/g	NA	0.99	U	0.98	U	0.58	J	0.54	J	0.53	J	0.98	U	0.26	J	0.32	J
PCB-105	pg/g	NA	110		140		1,000		830		930		120		26		300	
PCB-106	pg/g	NA	0.99	U	0.98	U	0.99	U	0.99	U	0.99	U	0.98	U	0.98	U	1	U
PCB-107 AND 124	pg/g	NA	5	J	8.2	J	59		47		59		6.3	J	1.2	J	18	J
PCB-108 AND 119 AND 086 AND 097 AND 125 AND 087	pg/g	NA	100	J	170		1,300		1,300		1,400		94	J	17	J	320	
PCB-109	pg/g	NA	19	J	24		180		160		160		28		5.4	J	58	
PCB-110 AND 115	pg/g	NA	210		340		2,500		2,900		3,000		200		33	J	630	
PCB-111	pg/g	NA	0.99	U	0.98	U	0.99	U	0.99	U	0.99	U	0.98	U	0.98	U	1	U
PCB-112	pg/g	NA	0.99	U	0.98	U	0.99	U	0.99	U	0.99	U	0.98	U	0.98	U	1	U
PCB-113 AND 090 AND 101	pg/g	NA	180		310		2,300		2,300		2,500		210		39	J	680	

Table D-33. PCB Congeners in Sediment – 2019 (continued)

		Location Name	MA-19	MA-21	MA22	MA-23		TF-18	TF-20	TF-21
		Sample Name	SED-MA19-190604	SED-MA21-190604	SED-MA22-190604	SED-MA23-190604	FD-190604-01	SED-TF18-190605	SED-TF20-190604	SED-TF21-190604
		Sample Collection Date	6/4/2019	6/4/2019	6/4/2019	6/4/2019	6/4/2019	6/5/2019	6/4/2019	6/4/2019
		Sample Type	N	N	N	P	FD	N	N	N
Analyte	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
PCB-114	pg/g	NA	3.9	4.5	36	27	38	3.7	0.75 J	10
PCB-117 AND 116 AND 085	pg/g	NA	38 J	55 J	430	420	430	41 J	7.9 J	110
PCB-118	pg/g	NA	290	400	3,100	2,400	2,700	350	70	870
PCB-120	pg/g	NA	0.99 U	0.98 U	0.99 U	0.99 U	0.99 U	0.98 U	0.98 U	4.9 J
PCB-121	pg/g	NA	0.99 U	0.98 U	0.99 U	0.99 U	0.99 U	0.98 U	0.98 U	1 U
PCB-122	pg/g	NA	2.9 J	4 J	26	29	36	3.2 J	0.98 U	6.6 J
PCB-123	pg/g	NA	4	6	45	31	43	4.2	1.2 J	10
PCB-126	pg/g	NA	0.99 U	0.98 U	0.99 U	0.99 U	0.99 U	0.98 U	0.67 J	1 U
PCB-127	pg/g	NA	0.99 U	0.98 U	0.99 U	0.99 U	0.99 U	0.98 U	0.98 U	1 U
PCB-128 AND 166	pg/g	NA	50	60	530	710	690	60	11 J	150
PCB-130	pg/g	NA	17 J	21	200	280	280	22	4.4 J	53
PCB-131	pg/g	NA	2.2 J	3.2 J	30	46	47	0.98 U	0.98 U	7.5 J
PCB-132	pg/g	NA	45	71	670	1,000	1,000	56	9.5 J	180
PCB-133	pg/g	NA	2.7 J	3.4 J	32	41	40	4.6 J	0.98 J	8.7 J
PCB-134 AND 143	pg/g	NA	9.4 J	12 J	130	170	190	8.5 J	1.8 J	31 J
PCB-136	pg/g	NA	14 J	20	220	290	300	17 J	4.1 J	61
PCB-137	pg/g	NA	13 J	18 J	160	240	230	12 J	2 J	41
PCB-138 AND 163 AND 129	pg/g	NA	270 _	330 _	2,900 _	3,900 _	3,900 _	340 _	66 _	830 _
PCB-139 AND 140	pg/g	NA	4.5 J	5.6 J	57	73	74	5 J	0.85 J	15 J
PCB-141	pg/g	NA	18 J	29	240	430	410	18 J	3.1 J	59
PCB-142	pg/g	NA	0.99 U	0.98 U	0.99 U	0.99 U	0.99 U	0.98 U	0.98 U	1 U
PCB-144	pg/g	NA	5.5 J	7.1 J	71	110	110	4.9 J	1.3 J	17 J
PCB-145	pg/g	NA	0.99 U	0.98 U	0.99 U	0.99 U	0.99 U	0.98 U	0.98 U	1 U
PCB-146	pg/g	NA	29	34	310	420	410	47	11 J	95
PCB-147 AND 149	pg/g	NA	120	150	1,500	2000	2,000	150	31 J	430
PCB-148	pg/g	NA	0.99 U	0.98 U	0.99 U	0.99 U	0.99 U	0.98 U	0.98 U	1 U
PCB-150	pg/g	NA	0.99 U	0.98 U	0.99 U	0.99 U	0.99 U	0.98 U	0.98 U	1 U
PCB-151 AND 135	pg/g	NA	35 J	49	460	670	670	50	12 J	130
PCB-152	pg/g	NA	0.99 U	0.98 U	0.99 U	0.99 U	0.99 U	0.98 U	0.98 U	1 U
PCB-153 AND 168	pg/g	NA	190	230	2,000	2,500	2,500	270	59	610

Table D-33. PCB Congeners in Sediment – 2019 (continued)

Location Name			MA-19	MA-21	MA22	MA-23		TF-18	TF-20	TF-21
Sample Name			SED-MA19-190604	SED-MA21-190604	SED-MA22-190604	SED-MA23-190604	FD-190604-01	SED-TF18-190605	SED-TF20-190604	SED-TF21-190604
Sample Collection Date			6/4/2019	6/4/2019	6/4/2019	6/4/2019	6/4/2019	6/5/2019	6/4/2019	6/4/2019
Sample Type			N	N	N	P	FD	N	N	N
Analyte	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
PCB-154	pg/g	NA	3 J	3.6 J	35	39	37	5.8 J	1.5 J	13 J
PCB-155	pg/g	NA	0.99 U	0.98 U	0.99 U	0.99 U	0.99 U	0.98 U	0.98 U	1 U
PCB-156 AND 157	pg/g	NA	43	49	390	450	470	44	8.4	120
PCB-158	pg/g	NA	28	32	310	400	410	25	4.4 J	76
PCB-159	pg/g	NA	0.99 U	0.54 J	3.3 J	7 J	6.2 J	0.48 J	0.98 U	0.88 J
PCB-160	pg/g	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
PCB-161	pg/g	NA	0.99 U	0.98 U	0.99 U	0.99 U	0.99 U	0.98 U	0.98 U	1 U
PCB-162	pg/g	NA	1.2 J	1.3 J	10 J	15 J	15 J	1.3 J	0.33 J	3 J
PCB-164	pg/g	NA	11 J	16 J	140	210	200	13 J	2.2 J	35
PCB-165	pg/g	NA	0.99 U	0.98 U	0.99 U	0.99 U	0.99 U	0.98 U	0.98 U	1 U
PCB-167	pg/g	NA	15	18	140	180	180	16	3.2	40
PCB-169	pg/g	NA	0.99 U	0.98 U	0.99 U	0.99 U	0.99 U	0.98 U	0.98 U	1 U
PCB-170	pg/g	NA	35	36	260	450	430	39	9.3 J	73
PCB-171 AND 173	pg/g	NA	9.2 J	11 J	85	130	130	13 J	3.2 J	26 J
PCB-172	pg/g	NA	3.7 J	5 J	35	62	59	6.3 J	1.6 J	11 J
PCB-174	pg/g	NA	13 J	19 J	130	260	250	19 J	4.6 J	38
PCB-175	pg/g	NA	1.1 J	1 J	11 J	16 J	16 J	2.3 J	0.59 J	3.5 J
PCB-176	pg/g	NA	2.4 J	2.7 J	27	44	44	3.8 J	1 J	7.7 J
PCB-177	pg/g	NA	13 J	15 J	110	180	180	23	6.1 J	38
PCB-178	pg/g	NA	4.7 J	5 J	46	62	63	13 J	3.7 J	18 J
PCB-179	pg/g	NA	5.6 J	6.7 J	65	110	100	12 J	3.6 J	20
PCB-180 AND 193	pg/g	NA	45	58	390	680	640	68	17 J	120
PCB-181	pg/g	NA	0.53 J	0.62 J	4.3 J	6.7 J	6 J	0.39 J	0.98 U	1.1 J
PCB-182	pg/g	NA	0.23 J	0.21 J	3.2 J	3.5 J	3.9 J	0.75 J	0.26 J	1 J
PCB-183	pg/g	NA	14 J	18 J	130	210	200	25	6.7 J	43
PCB-184	pg/g	NA	0.99 U	0.98 U	0.72 J	0.88 J	0.77 J	0.31 J	0.13 J	0.29 J
PCB-185	pg/g	NA	1.7 J	1.7 J	12 J	23	21	0.85 J	0.33 J	3.2 J
PCB-186	pg/g	NA	0.99 U	0.98 U	0.99 U	0.27 J	0.99 U	0.98 U	0.98 U	1 U
PCB-187	pg/g	NA	26	28	250	350	340	68	20	94
PCB-188	pg/g	NA	0.4 U	0.31 U	1.5 J	1.5 J	1.6 J	1 J	0.43 U	1.1 J
PCB-189	pg/g	NA	1.6 J	2	13	21	19	2.1	0.76 J	4.3

Table D-33. PCB Congeners in Sediment – 2019 (continued)

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Table D-34. Total PCBs (Congeners) in Sediment – 2019

Location Name	Sample Name	Sample type	Total PCBs (Sum of analyte value with ND as null) Result (pg/g)	Total number of PCBs detections
			Freshwater	
		SMS Sediment SCO	**110,000**	
		SMS Sediment CSL	**2,500,000**	
MA19	SED-MA19-190604	N	3,398	163
MA21	SED-MA21-190604	N	5,357	161
MA22	SED-MA22-190604	N	40,595	171
MA23	SED-MA23-190604	P	38,605	171
MA23 (dup)	FD-190604-01	FD	41,180	170
TF18	SED-TF18-190605	N	4,005	163
TF20	SED-TF20-190604	N	889	148
TF21	SED-TF21-190604	N	10,541	171

Notes:
All samples analyzed using analytical method 1668C.
CSL – cleanup screening level
DUP – Duplicate
FD - Field Duplicate
N – Sample is not part of a field duplicate pair
P – Parent sample of field duplicate
SCO - sediment cleanup objective
SMS - Sediment Management Standards (WAC 173-204-563)
Bolded values exceed the SCO
pg/g - picograms per gram

Table D-35. Slug Tests Results

Well Location	Date of Test	Screened Interval (ft bgs)	Test Type	Initial Displacement (ft)	K (ft/day)	Average K[1] (ft/day	Average K[1] (cm/s)	V[2] (ft/day)	Average V[2] (ft/day)	Average V[2] (cm/s)	USCS (of screened interval)
MW1-39	5/4/2022	27.5-32.5	Falling Head - Run 1	1.85	64.48	111.4266667	4.03E-03	1.488	2.571384615	9.07E-04	ML/GW-GM/SP
			Falling Head - Run 2	1.912	111.6			2.575384615			
			Falling Head - Run 3	1.855	158.2			3.650769231			
			Rising Head - Run 1	1.937	50.71	44.5	1.57E-02	1.170230769	1.026923077	3.62E-04	
			Rising Head - Run 2	1.918	38.29			0.883615385			
MW1-43	5/3/2022	15-25	Falling Head - Run 1	2.541	3.521	3.784	1.33E-03	0.081253846	0.087323077	3.08E-05	SP/ML
			Falling Head - Run 2	2.25	3.639			0.083976923			
			Falling Head - Run 3	2.872	4.192			0.096738462			
			Rising Head - Run 1	2.458	3.537	3.478333333	1.23E-03	0.081623077	0.080269231	2.83E-05	
			Rising Head - Run 2	2.876	3.569			0.082361538			
			Rising Head - Run 3	2.334	3.329			0.076823077			
MW1-44	5/3/2022	18-28	Falling Head - Run 1	2.593	2.379	2.742	9.67E-04	0.0549	0.063276923	2.23E-05	SM/ML
			Falling Head - Run 2	2.021	2.785			0.064269231			
			Falling Head - Run 3	2.14	3.062			0.070661538			
			Rising Head - Run 1	2.365	2.163	2.1565	7.61E-04	0.049915385	0.049765385	1.76E-05	
			Rising Head - Run 2	2.413	2.15			0.049615385			
MW1-46	7/15/2022	24-34	Falling Head - Run 1	2.746	5.776	5.8875	2.08E-03	0.133292308	0.135865385	4.79E-05	SP
			Falling Head - Run 2	2.527	5.999			0.138438462			
			Rising Head - Run 1	2.396	5.213	5.269	1.86E-03	0.1203	0.121592308	4.29E-05	
			Rising Head - Run 2	2.199	5.325			0.122884615			
MW1-47	6/24/2021	15 - 25	Falling Head - Run 1	3.009	4.063	4.1145	1.45E-03	0.093761538	0.09495	3.35E-05	SP/SM
			Falling Head - Run 2	3.32	4.166			0.096138462			
			Rising Head - Run 1	2.578	4.088	4.1765	1.47E-03	0.094338462	0.096380769	3.40E-05	
			Rising Head - Run 2	2.575	4.265			0.098423077			
MW1-49	4/29/2022	5-15	Falling Head - Run 1	2.307	18.88	20.56333333	7.25E-03	0.435692308	0.461653846	1.63E-04	SP
			Falling Head - Run 2	1.769	21.13			0.487615385			
			Falling Head - Run 3	2.187	21.68			0.500307692			
			Rising Head - Run 1	2.094	18.19	18.29666667	6.45E-03	0.419769231	0.422230769	1.49E-04	
			Rising Head - Run 2	1.923	17.75			0.409615385			
			Rising Head - Run 3	2.674	18.95			0.437307692			
MW1-50	7/15/2022	5-15	Falling Head - Run 1	0.5189	2.312	2.483	8.76E-04	0.053353846	0.0573	2.02E-05	SP
			Falling Head - Run 2	0.8537	2.654			0.061246154			
			Rising Head - Run 1	2.532	8.135	5.328	1.88E-03	0.187730769	0.122953846	4.34E-05	
			Rising Head - Run 2	4.531	2.521			0.058176923			

Table D-35. Slug Tests Results (continued)

Well Location	Date of Test	Screened Interval (ft bgs)	Test Type	Initial Displacement (ft)	K (ft/day)	Average K[1] (ft/day	Average K[1] (cm/s)	V[2] (ft/day)	Average V[2] (ft/day)	Average V[2] (cm/s)	USCS (of screened interval)
MW1-62	5/4/2022	31-41	Falling Head - Run 1	1.507	226.6	186.1333333	6.57E-02	5.229230769	4.295384615	1.52E-03	SW/GW/ML
			Falling Head - Run 2	2.048	215.6			4.975384615			
			Falling Head - Run 3	1.309	116.2			2.681538462			
			Rising Head - Run 1	0.8755	178.4	171.7	6.06E-02	4.116923077	3.962307692	1.40E-03	
			Rising Head - Run 2	1.055	176.3			4.068461538			
			Rising Head - Run 3	0.9469	160.4			3.701538462			
MW1-62	7/15/2022	31-41	Falling Head - Run 1	1.484	100.3	169.5	5.98E-02	2.314615385	3.911538462	1.38E-03	SW/GW/ML
			Falling Head - Run 2	1.475	238.7			5.508461538			
			Rising Head - Run 1	0.8842	160.4	191.8	6.77E-02	3.701538462	4.426153846	1.56E-03	
			Rising Head - Run 2	1.081	223.2			5.150769231			
MW1-63	6/24/2021	30 - 40	Falling Head - Run 1	1.233	172.1	235.9	8.32E-02	3.971538462	5.443846154	1.92E-03	GW
			Falling Head - Run 2	1.488	299.7			6.916153846			
			Rising Head - Run 1	1.157	140.9	152.7	5.39E-02	3.251538462	3.523846154	1.24E-03	
			Rising Head - Run 2	1.008	164.5			3.796153846			
MW1-64	5/4/2022	45-55	**Data unable to process**								SW/SP/MH
MW1-65	6/24/2021	53 - 63	Falling Head - Run 1	1.556	162.1	195.25	6.89E-02	3.740769231	4.505769231	1.59E-03	SW/GW
			Falling Head - Run 2	2.14	228.4			5.270769231			
			Rising Head - Run 1	1.583	237.9	237.9	8.39E-02	5.49	5.49	1.94E-03	
			Rising Head - Run 2	2.247	237.9			5.49			
MW1-66	4/29/2022	5-20	Falling Head - Run 1	1.349	4.631	4.465333333	1.58E-03	0.106869231	0.103046154	3.63E-05	SP
			Falling Head - Run 2	1.79	4.346			0.100292308			
			Falling Head - Run 3	1.82	4.419			0.101976923			
			Rising Head - Run 1	1.304	4.051	4.041666667	1.43E-03	0.093484615	0.093269231	3.29E-05	
			Rising Head - Run 2	1.556	4.078			0.094107692			
			Rising Head - Run 3	1.394	3.996			0.092215385			
MW1-68	4/29/2022	37-47	Falling Head - Run 1	2.589	63.5	67.31	2.37E-02	1.465384615	1.553307692	5.48E-04	CH/SM
			Falling Head - Run 2	1.754	64.42			1.486615385			
			Falling Head - Run 3	1.454	74.01			1.707923077			
			Rising Head - Run 1	1.771	55.96	57.49766667	2.03E-02	1.291384615	1.326869231	4.68E-04	
			Rising Head - Run 2	2.146	60.91			1.405615385			
			Rising Head - Run 3	2.164	55.623			1.283607692			
MW1-72	5/11/2022	60-70	Falling Head - Run 1	2.739	46.56	73.66	2.60E-02	1.074461538	1.699846154	6.00E-04	SP/GP/SW
			Falling Head - Run 2	3.709	75.13			1.733769231			
			Falling Head - Run 3	2.637	99.29			2.291307692			

Table D-35. Slug Tests Results (continued)

Well Location	Date of Test	Screened Interval (ft bgs)	Test Type	Initial Displacement (ft)	K (ft/day)	Average K[1] (ft/day	Average K[1] (cm/s)	V[2] (ft/day)	Average V[2] (ft/day)	Average V[2] (cm/s)	USCS (of screened interval)
			Rising Head - Run 1	1.581	94.7	96.29333333	3.40E-02	2.185384615	2.222153846	7.84E-04	
			Rising Head - Run 2	1.645	98.04			2.262461538			
			Rising Head - Run 3	1.643	96.14			2.218615385			
MW1-74	7/15/2022	45-55	Falling Head - Run 1	1.145	162.2	162.2	5.72E-02	3.743076923	3.743076923	1.32E-03	SP
			Rising Head - Run 1	1.444	58.84	58.84	2.08E-02	1.357846154	1.357846154	4.79E-04	

Notes:
[1] Average of rising head tests should be used for further calculations. Overall, results of multiple runs were more repeatable for rising head tests than falling head tests [initial displacement and K results]. Also, one outlier appears to exist for MW1-63 and MW1-65 falling head tests.)
[2] $V = K*i/n_e$
cm/s = centimeters per second
ft/day = feet per day
i = hydraulic gradient (=0.006, calculated from 2019 GW elevation data)
K - hydraulic conductivity
n_e = effective porosity
USCS - Unified Soil Classification System
V - groundwater velocity

Table D-36. Lithology and Hydraulic Parameters at OU 1 Monitoring Wells (Wells with Slug Tests or Physical Characterization in Screen Interval Only)

Well Location	Screened Interval (ft bgs)	HSU	Lithology			Hydraulic Parameters			Slug Test Results	
			Field Description [1]	USCS (field)	Mean Grain Size (Lab) - USCS/ASTM	Effective Porosity	Horizontal K (cm/s)	Vertical K (cm/s)	Average K (cm/s) [2]	Average V (fcm/s) [3]
MW1-39	27.5-32.5	N/A (Undifferentiated drift)	Silt with clay, very fine to medium sand with trace/little silt, sandy silt (all interbedded) to sandy (fine to very coarse) gravel with little silt	ML/GW-GM/SP	N/A	N/A	N/A	N/A	1.57E-02	3.62E-04
MW1-43/B77	15-25	Semi-confining unit	Silt with trace fine sand, 20% clay to fine sand with trace fines	SP/ML	N/A	N/A	N/A	N/A	1.23E-03	2.83E-05
MW1-44/B75	18-28	Semi-confining unit	Silty fine sand to silt with 20-30% clay and trace fine sand	SM/ML	N/A	N/A	N/A	N/A	7.61E-04	1.76E-05
MW1-46/B78	24-34	HSU #2	Fine sand (trace medium to coarse), trace fines, grades to coarse sand	SP	Fine Sand	30.1	7.18E-03	N/A	1.86E-03	4.29E-05
MW1-47/B79	15-25	Semi-confining unit & HSU #2	Fine sand with varying amounts of silt	SP/SM	Fine Sand	28.1	2.47E-05	N/A	1.47E-03	3.40E-05
MW1-48/B83	15-25	HSU #2	Fine sand with varying amounts of silt	SP-SM/SP/SM	Fine Sand	18.8	2.27E-05	N/A	N/A	N/A
MW1-49/B80	5-15	HSU #1 & Semi-confining unit	Fine sand (trace medium to coarse)	SP	N/A	N/A	N/A	N/A	6.45E-03	1.49E-04
MW1-50/B73	5-15	HSU #1 & Semi-confining unit	Fine to medium sand, trace fines	SP	Fine Sand	19.2	1.00E-03	N/A	1.88E-03	4.34E-05
MW1-52/B72	7-17	HSU #1 & Semi-confining unit	Fine to medium sand with trace silt and interbedded clay lenses	SP/CL/SP-SM	Fine Sand	23.3	8.92E-04	N/A	N/A	N/A
MW1-56	10 [4]	HSU #1	Fine sand, trace fines	SP	Fine Sand	25.1	1.20E-06	N/A	N/A	N/A
	22 [4]	HSU #2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	34 [4]	HSU #2	Fine sand, trace fines	SP	N/A	N/A	N/A	N/A	N/A	N/A
MW1-58	7 [4]	HSU #1	Silty gravel with sand	GM	Coarse Sand	33.5	2.93E-07	N/A	N/A	N/A
	17 [4]	Semi-confining unit and/or HSU #2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	36 [4]	HSU #2	Medium sand	SP	Medium Sand	20.5	3.15E-06	N/A	N/A	N/A
MW1-62/NP-B135	31-41	HSU #3 / Fine-grained Olympia	Sandy gravel to well graded gravelly sand to silt	GW/SW/ML	N/A	N/A	N/A	N/A	6.34E-02	1.46E-03
MW1-63/NP-B136	30-40	HSU #3	Well graded sandy gravel	GW	N/A	N/A	N/A	N/A	5.39E-02	1.24E-03
MW1-65/NP-B138	53-63	HSU #4	Sandy gravel to gravelly sand	SW/GW	N/A	N/A	N/A	N/A	8.39E-02	1.94E-03

Table D-36. Lithology and Hydraulic Parameters at OU 1 Monitoring Wells (Wells with Slug Tests or Physical Characterization in Screen Interval Only)

Well Location	Screened Interval (ft bgs)	HSU	Lithology			Hydraulic Parameters			Slug Test Results	
			Field Description [1]	USCS (field)	Mean Grain Size (Lab) - USCS/ASTM	Effective Porosity	Horizontal K (cm/s)	Vertical K (cm/s)	Average K (cm/s) [2]	Average V (fcm/s) [3]
MW1-66/SP-B139	5-20	HSU #2	Poorly graded sand	SP	N/A	N/A	N/A	N/A	1.43E-03	3.29E-05
MW1-68/SP-B144	37-47	Fine-grained Olympia / Top of HSU #4	Clay, with minor organic (peat) layers to silty fine sand (bottom 1-foot)	CH/SM	N/A	N/A	N/A	N/A	2.03E-02	4.68E-04
MW1-69/SP-B174	42-52	HSU #4	Sand and gravel with varying amounts of silt (trace to little)	SP/SW/GW	Medium Sand	32.02	6.76E-04	6.35E-04	N/A	N/A
MW1-72/NP-B177	60-70	HSU #4	Silty sandy gravel to well graded sand to silty sandy gravel to very fine to medium sand	GP/SW/SP	Fine Sand	N/A	N/A	N/A	3.40E-02	7.84E-04
MW1-74/DG-B179	45-55	HSU #3	Fine sand, trace fine gravel	SP	Medium Sand	N/A	4.48E-03 [5]	4.32E-02 [5]	2.08E-02	4.79E-04

Notes:
cm/s - centimeters per second
ft bgs - feet below ground surface
HSU - hydrostratigraphic unit
K - hydraulic conductivity
[1] Field description for screened interval of well; entries with multiple descriptions are described shallow to deep, within screened interval
[2] Average *K* is average of rising head tests (see Table X). Overall, results of multiple runs were more repeatable for rising head tests than falling head tests [initial displacement and K results].
[3] $V = K*i/n_e$; i = 0.006 (calculated from 2019 GW elevation data); ne = 0.26 (2017 data)
[4] Well screen is 6-inch in length, centered at number shown
[5] Value shown is average of samples collected from 45 and 55 feet bgs

Table D-37. ISM PCB and TOC Analytical Results

LOCATION_NAME		DU1		DU1		DU1		DU2		DU2		DU2		DU3		DU3		DU3	
Depth Range (feet)		0 - 0.3		0 - 0.3		0 - 0.3		0 - 0.3		0 - 0.3		0 - 0.3		0 - 0.3		0 - 0.3		0 - 0.3	
SAMPLE_NAME		DU1-SED-P-10-210623		DU1-SED-R1-10-210623		DU1-SED-R2-10-210623		DU2-SED-P-10-210623		DU2-SED-R1-10-210623		DU2-SED-R2-10-210623		DU3-SED-P-10-210623		DU3-SED-R1-10-210623		DU3-SED-R2-10-210623	
ANALYTE	UNITS	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q
TOTAL ORGANIC CARBON	MG_KG	14000		18000		14000		9300		10000		16000		10000		8000		8500	
PCB-001	NG_KG	60	J	42	J	40	J	140		39		47	J	16	U	12	U	21	U
PCB-002	NG_KG	47	J	100		80	J	80		37		76	J	43		39		46	
PCB-003	NG_KG	37	U	35	U	52	U	76	U	32	U	32	U	22	U	20	U	18	U
PCB-004	NG_KG	150		89	J	110		230		100		130		110	J	43		62	
PCB-005	NG_KG	24	U	24	U	24	U	4.7	U	4.7	U	24	U	10	U	4.9	U	4.6	U
PCB-006	NG_KG	230		240		440		610		230		170		74		49		69	
PCB-007	NG_KG	20	J	22	J	38	J	34		19		24	U	10	U	4.9	U	8.4	J
PCB-008	NG_KG	330		200		190		350		190		190		240		110		120	
PCB-009	NG_KG	20	J	15	J	23	J	26		13	J	24	U	10	U	4.9	U	7.1	J
PCB-010	NG_KG	8.9	J	5	J	24	U	13	J	6.7	J	24	U	10	U	4.9	U	4.5	J
PCB-011	NG_KG	72	J	69	J	130		190		210		59	J	39	J	45		49	
PCB-012 AND 013	NG_KG	65	J	68	J	130	J	120		120		48	U	20	U	29	J	31	J
PCB-014	NG_KG	24	U	24	U	24	U	4.7	U	4.7	U	24	U	10	U	4.9	U	4.6	U
PCB-015	NG_KG	320		230		200		260		180		220		170		150		130	
PCB-016	NG_KG	450		150		93	J	170		98		110		180		81		72	
PCB-017	NG_KG	660		380		850		640		370		220		220		110		100	
PCB-019	NG_KG	280		190		500		300		88		91	J	61	J	29		39	
PCB-021 AND 033	NG_KG	870		380		260		350		170		140	J	300		180		110	J
PCB-022	NG_KG	440		150		92	J	140		1.9	U	76	J	170		120		78	
PCB-023	NG_KG	4.8	U	4.9	U	4.8	U	0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-024	NG_KG	16	J	7.5	J	4.8	U	0.94	U	0.95	U	4.8	U	5.2	J	2.9	J	2.4	J
PCB-025	NG_KG	910		1100		3600		4200		1800		460		98		77		250	
PCB-026 AND 029	NG_KG	2900		3400		11000		12000		4100		1200		210		160		560	
PCB-027	NG_KG	290		340		850		630		280		160		53		34		55	
PCB-028 AND 020	NG_KG	1400		800		790		1400		560		470		540		360		350	
PCB-030 AND 018	NG_KG	1400		820		2500		1500		780		510		390		190		170	
PCB-031	NG_KG	1400		930		1700		2200		930		440		440		290		290	
PCB-032	NG_KG	670		460		1400		750		200		240		160		83		81	
PCB-034	NG_KG	4.8	U	4.9	U	4.8	U	0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-035	NG_KG	42	J	4.9	U	4.8	U	0.94	U	0.95	U	4.8	U	2	U	10	J	0.92	U
PCB-036	NG_KG	200		290		670		0.94	U	220		4.8	U	29	J	0.98	U	0.92	U
PCB-037	NG_KG	530		330		200		200		96	J	140		240		140		120	
PCB-038	NG_KG	4.8	U	4.9	U	4.8	U	0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-039	NG_KG	4.8	U	4.9	U	4.8	U	0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-040 AND 071	NG_KG	1900		2200		7300		4300		1800		1100		360		180		340	
PCB-041	NG_KG	9.6	U	9.7	U	9.6	U	1.9	U	1.9	U	9.7	U	43		2	U	1.8	U
PCB-042	NG_KG	580		830		590		1800		530		320		240		100		220	
PCB-043	NG_KG	4.8	U	4.9	U	4.8	U	0.94	U	0.95	U	4.8	U	28	J	0.98	U	0.92	U
PCB-044 AND 047 AND 065	NG_KG	4000		6000		7800		10000		4900		2200		990		440		1300	
PCB-045	NG_KG	290		180		4.8	U	0.94	U	170		4.8	U	92		47		57	
PCB-046	NG_KG	160		150		4.8	U	480		160		4.8	U	41		21		44	
PCB-048	NG_KG	240		210		4.8	U	0.94	U	0.95	U	4.8	U	99		46		62	
PCB-050 AND 053	NG_KG	1200		1500		5300		2800		790		660		160		91		160	
PCB-051	NG_KG	290		340		1100		690		210		140		35	J	17	J	31	
PCB-052	NG_KG	10000		16000		27000		27000		11000		5600		1700		890		2700	
PCB-054	NG_KG	29	J	31	J	87	J	44		7.9	J	11	J	2.4	J	1.3	J	1.5	J
PCB-055	NG_KG	210		4.9	U	96		0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-056	NG_KG	770		910		480		680		250		290		240		110		240	
PCB-057	NG_KG	100		71	J	62	J	280		0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-058	NG_KG	44	J	57	J	45	J	0.94	U	0.95	U	4.8	U	2	U	53		0.92	U
PCB-059 AND 062 AND 075	NG_KG	480		530		770		1600		1000		230	J	96	J	54	J	220	
PCB-060	NG_KG	370		340		170		180		75		110		110		49		84	
PCB-061 AND 070 AND 074 AND 076	NG_KG	6000		9200		5700		7500		2700		2800		1400		700		2200	

Table D-37. ISM PCB and TOC Analytical Results

LOCATION_NAME		DU1		DU1		DU1		DU2		DU2		DU2		DU3		DU3		DU3	
Depth Range (feet)		0 - 0.3		0 - 0.3		0 - 0.3		0 - 0.3		0 - 0.3		0 - 0.3		0 - 0.3		0 - 0.3		0 - 0.3	
SAMPLE_NAME		DU1-SED-P-10-210623		DU1-SED-R1-10-210623		DU1-SED-R2-10-210623		DU2-SED-P-10-210623		DU2-SED-R1-10-210623		DU2-SED-R2-10-210623		DU3-SED-P-10-210623		DU3-SED-R1-10-210623		DU3-SED-R2-10-210623	
ANALYTE	UNITS	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q
PCB-063	NG_KG	160		200		110		200		68		74	J	50		19	J	36	J
PCB-064	NG_KG	1000		1500		1300		1900		850		530		300		140		330	
PCB-066	NG_KG	3100		4300		3700		4800		1600		1700		900		440		990	
PCB-067	NG_KG	350		280		470		540		120		100		41		26		26	J
PCB-068	NG_KG	170		200		430		460		170		91	J	32	J	13	J	30	J
PCB-069 AND 049	NG_KG	5500		7600		17000		17000		7300		3000		950		440		1300	
PCB-072	NG_KG	340		400		890		840		340		160		52		23		59	
PCB-073	NG_KG	4.8	U	110		230		0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-077	NG_KG	430		530		340		370	J	130		220		120		70		140	
PCB-078	NG_KG	110		140		85	J	0.94	U	0.95	U	4.8	U	2	U	0.98	U	19	J
PCB-079	NG_KG	200		260		170		210		64		68	J	36	J	21		59	
PCB-080	NG_KG	4.8	U	4.9	U	4.8	U	99		32		4.8	U	21	J	13	J	35	
PCB-081	NG_KG	4.8	U	4.9	U	4.8	U	0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-082	NG_KG	1600		2200		1100		1200		440		670		300		200		580	
PCB-083	NG_KG	1200		1200		1000		820		260		410		240		120		300	
PCB-084	NG_KG	4500		6900		5200		6200		2600		2000		1000		520		1700	
PCB-088 AND 091	NG_KG	3200		4600		5800		6100		3200		1500		670		400		1100	
PCB-089	NG_KG	4.8	U	4.9	U	4.8	U	0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-092	NG_KG	3200		4500		2500		3100		1100		1400		750		460		1200	
PCB-093 AND 100	NG_KG	9.6	U	9.7	U	490		570		1.9	U	9.7	U	4	U	2	U	1.8	U
PCB-094	NG_KG	4.8	U	4.9	U	4.8	U	0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-095	NG_KG	13000	J	20000		17000		19000		8700		6500		3100		1700		4800	
PCB-096	NG_KG	130		180		300		240		86		65	J	25	J	11	J	34	
PCB-098 AND 102	NG_KG	860		1100		1600		1700		450		420		170		99		240	
PCB-099	NG_KG	9800	J	13000		9200		12000		3400		4400		2000		1300		2700	
PCB-103	NG_KG	4.8	U	4.9	U	560		650		260		140		2	U	29		0.92	U
PCB-104	NG_KG	6.4	J	7.3	J	22	J	17	J	4.7	J	2.5	J	2	U	0.37	J	0.76	J
PCB-105	NG_KG	6900		8400		4800		4400		1500		3000		950		700		1700	
PCB-106	NG_KG	4.8	U	4.9	U	4.8	U	0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-107 AND 124	NG_KG	600		670		410		560		200		270		94		79		220	
PCB-108 AND 119 AND 086 AND 097 AND 125 AND 087	NG_KG	12000		15000		9600		9900		4200		4500		2000		1400		4100	
PCB-109	NG_KG	1300		1600		920		1300		490		620		260		180		430	
PCB-110 AND 115	NG_KG	22000	J	30000		23000		26000		9100		9600		4300		3000		1.8	U
PCB-111	NG_KG	4.8	U	4.9	U	4.8	U	0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-112	NG_KG	4.8	U	4.9	U	4.8	U	0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-113 AND 090 AND 101	NG_KG	18000		25000		15000		17000		5400		7200		3600		2300		5200	
PCB-114	NG_KG	350		380		4.8	U	260		100		170		2	U	34		120	
PCB-117 AND 116 AND 085	NG_KG	2900		3200	J	1900		2900		880		1300		520		370		1000	J
PCB-118	NG_KG	20000		23000		14000		18000		5400		8800		3100		1900		4800	
PCB-120	NG_KG	4.8	U	4.9	U	4.8	U	0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-121	NG_KG	4.8	U	4.9	U	4.8	U	0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-122	NG_KG	4.8	U	4.9	U	4.8	U	0.94	U	0.95	U	140		2	U	37		99	
PCB-123	NG_KG	4.8	U	4.9	U	4.8	U	270		90		170		2	U	41		93	J
PCB-126	NG_KG	4.8	U	4.9	U	4.8	U	0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-127	NG_KG	4.8	U	4.9	U	4.8	U	0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-128 AND 166	NG_KG	5300		5300		3800		3200		1000		1900		860		580		1400	
PCB-130	NG_KG	2000		2100		1300		1200		390		720		350		230		570	

Table D-37. ISM PCB and TOC Analytical Results

LOCATION_NAME		DU1		DU1		DU1		DU2		DU2		DU2		DU3		DU3		DU3	
Depth Range (feet)		0 - 0.3		0 - 0.3		0 - 0.3		0 - 0.3		0 - 0.3		0 - 0.3		0 - 0.3		0 - 0.3		0 - 0.3	
SAMPLE_NAME		DU1-SED-P-10-210623		DU1-SED-R1-10-210623		DU1-SED-R2-10-210623		DU2-SED-P-10-210623		DU2-SED-R1-10-210623		DU2-SED-R2-10-210623		DU3-SED-P-10-210623		DU3-SED-R1-10-210623		DU3-SED-R2-10-210623	
ANALYTE	UNITS	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q
PCB-131	NG_KG	410		460		260		270		89		130		71		46		110	
PCB-132	NG_KG	7800		8500		4800		4900		1600		2500		1300		840		2200	
PCB-133	NG_KG	330		360		190		240		77		120		63		45		99	
PCB-134 AND 143	NG_KG	1200		1400		750		840		260		440		240		150		360	
PCB-136	NG_KG	2100		2500		2100		2100		790		730		380		210		570	
PCB-137	NG_KG	1700		1700		1200		980		310		620		290		180		470	
PCB-138 AND 163 AND 129	NG_KG	29000		29000		20000		15000		5500		9400		4500		3000		7000	
PCB-139 AND 140	NG_KG	680		730		520		500		160		250		120		76		170	
PCB-141	NG_KG	3200		3300		1900		1600		510		910		560		340		940	
PCB-142	NG_KG	4.8	U	4.9	U	4.8	U	0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-144	NG_KG	770		850		530		470		160		250		140		84		220	
PCB-145	NG_KG	4.8	U	4.9	U	4.8	U	0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-146	NG_KG	2600		2800		1800		1800		570		930		510		320		760	
PCB-147 AND 149	NG_KG	15000		16000		13000		13000		4000		5000		2600		1600		3900	
PCB-148	NG_KG	4.8	U	4.9	U	4.8	U	0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-150	NG_KG	4.8	U	4.9	U	65	J	61		24		4.8	U	2	U	0.98	U	0.92	U
PCB-151 AND 135	NG_KG	4300		4900		2800		3200		980		1500		900		560		1400	
PCB-152	NG_KG	4.8	U	4.9	U	4.8	U	0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-153 AND 168	NG_KG	18000		18000		13000		11000		3600		5800		2900		1900		4300	
PCB-154	NG_KG	300		310		380		400		130		120		56		36		71	
PCB-155	NG_KG	4.8	U	4.9	U	4.8	U	0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-156 AND 157	NG_KG	3800		3300		2200		2300		730		1200		490	J	350		910	
PCB-158	NG_KG	2900		2800		2100		1800		550		920		410		260		680	
PCB-159	NG_KG	74	J	75	J	54	J	27	J	11	J	16	J	12	J	8.7	J	21	
PCB-160	NG_KG	9.6	U	9.7	U	9.6	U	1.9	U	1.9	U	9.7	U	4	U	2	U	1.8	U
PCB-161	NG_KG	4.8	U	4.9	U	4.8	U	0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-162	NG_KG	110		110		65	J	64		21		36	J	17	J	13	J	35	
PCB-164	NG_KG	1900		2000		1300		1200		370		580		330		210		500	
PCB-165	NG_KG	4.8	U	4.9	U	4.8	U	0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-167	NG_KG	1200		1200		800		820		260		430		200	J	140		330	
PCB-169	NG_KG	4.8	U	4.9	U	4.8	U	0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-170	NG_KG	2700		2500		2100		1800		550		930		550		370		890	
PCB-171 AND 173	NG_KG	930		870		680		590		190		290		180		120		280	
PCB-172	NG_KG	460		430		320		260		88		130		93		67		160	
PCB-174	NG_KG	1700		1700		1200		1000		310		470		370		250		610	
PCB-175	NG_KG	140		130		110		74		23		40	J	25	J	16	J	40	
PCB-176	NG_KG	360		360		310		210		74		100		64		40		98	
PCB-177	NG_KG	1100		1000		810		720		230		350		240		170		380	
PCB-178	NG_KG	440		440		360		240		82		150		97		63		140	
PCB-179	NG_KG	700		710		560		380		120		220		150		90		210	
PCB-180 AND 193	NG_KG	3800		3700		2900		2400		730		1200		800		540		1300	
PCB-181	NG_KG	73	J	68	J	52	J	54		17	J	20	J	12	J	7.7	J	22	
PCB-182	NG_KG	39	J	33	J	31	J	22		7.5	J	10	J	6.3	J	2.9	J	8	J
PCB-183	NG_KG	1200		1100		92	J	730		240		340		210		140		340	
PCB-184	NG_KG	5.1	J	5.6	J	6.1	J	3.5	J	1.5	J	1.5	J	2	U	0.74	J	1.6	J
PCB-185	NG_KG	210		200		1300		210		45	J	65	J	63	J	41		95	
PCB-186	NG_KG	2.5	J	2.4	J	2.2	J	0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-187	NG_KG	1900		1900		1500		1100		360		660		430		270		600	
PCB-188	NG_KG	6.1	J	5.5	J	5.2	J	5.5	J	2.3	J	2.2	J	1.2	J	1.4	J	2.6	J
PCB-189	NG_KG	160		140		110		91		31		48		28		20		46	
PCB-190	NG_KG	430		400		350		260		86		140		86		60		140	
PCB-191	NG_KG	120		120		97		82		26		36	J	22	J	16	J	39	
PCB-192	NG_KG	4.8	U	4.9	U	4.8	U	0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-194	NG_KG	480		480		400		330		99		150		120		88		180	
PCB-195	NG_KG	190		180		160		120		38		56	J	45		32		70	

Table D-37. ISM PCB and TOC Analytical Results

LOCATION_NAME		DU1		DU1		DU1		DU2		DU2		DU2		DU3		DU3		DU3	
Depth Range (feet)		0 - 0.3		0 - 0.3		0 - 0.3		0 - 0.3		0 - 0.3		0 - 0.3		0 - 0.3		0 - 0.3		0 - 0.3	
SAMPLE_NAME		DU1-SED-P-10-210623		DU1-SED-R1-10-210623		DU1-SED-R2-10-210623		DU2-SED-P-10-210623		DU2-SED-R1-10-210623		DU2-SED-R2-10-210623		DU3-SED-P-10-210623		DU3-SED-R1-10-210623		DU3-SED-R2-10-210623	
ANALYTE	UNITS	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q	ANALYTE_VALUE	Q
PCB-196	NG_KG	350		360		290		210		62		110		86		57		120	
PCB-197	NG_KG	29	J	27	J	24	J	15	J	5.8	J	7.3	J	5.5	J	4.9	J	9.9	J
PCB-198 AND 199	NG_KG	550		600		460		320		100		180	J	180		110		240	
PCB-200	NG_KG	98		97		71	J	54		15	J	23	J	25	J	15	J	34	
PCB-201	NG_KG	97		100		80	J	58		20		29	J	27	J	18	J	39	
PCB-202	NG_KG	120		120		98		72		29		41	J	41		29		60	
PCB-203	NG_KG	370		370		310		210		66		120		110		69		140	
PCB-204	NG_KG	0.82	J	1.3	J	4.8	U	0.94	U	0.95	U	4.8	U	2	U	0.98	U	0.92	U
PCB-205	NG_KG	39	J	34	J	32	J	25		6.5	J	9.8	J	7.5	J	5.3	J	12	J
PCB-206	NG_KG	310		340		300		200		72		130		170		90		280	
PCB-207	NG_KG	46	J	49	J	40	J	28		9.4	J	18	J	21	J	13	J	33	
PCB-208	NG_KG	100		120		100		63		29		49	J	74		38		120	
PCB-209	NG_KG	220		270		210		140		69		140		200	J	93		300	

Notes;

PCB - polychlorinated biphenyls

mg/kg - milligrams per kilogram

ng/kg - nanograms per kilogram

Q - qualifier

J - estimated

U - undetected

Table D-38. ISM Total PCB Results Normalized to TOC

LOCATION_NAME		DU1	DU1	DU1	DU2	DU2	DU2	DU3	DU3	DU3
Depth Range (feet)		0 - 0.3	0 - 0.3	0 - 0.3	0 - 0.3	0 - 0.3	0 - 0.3	0 - 0.3	0 - 0.3	0 - 0.3
SAMPLE_NAME		DU1-SED-P-10-210623	DU1-SED-R1-10-210623	DU1-SED-R2-10-210623	DU2-SED-P-10-210623	DU2-SED-R1-10-210623	DU2-SED-R2-10-210623	DU3-SED-P-10-210623	DU3-SED-R1-10-210623	DU3-SED-R2-10-210623
GROUP	**RESULT_UNITS**	**ANALYTE_VALUE**	**ANALYTE_VALUE**	**ANALYTE_VALUE**	**ANALYTE_VALUE**	**ANALYTE_VALUE**	**ANALYTE_VALUE**	**ANALYTE_VALUE**	**ANALYTE_VALUE**	**ANALYTE_VALUE**
TOC	MG_KG	14000	18000	14000	9300	10000	16000	10000	8000	8500
Total PCB	NG_KG	297499.82	352471.6	311897.5	321542	118890.3	118598.3	56828.1	35343.21	77960.76
Total PCB TOC NORMALIZED	NG_KG	21249987.14	19581755.56	22278392.86	34574408.6	11889030	7412393.75	5682810	4417901.25	9171854.118

Notes:

TOC - total organic carbon

PCB - polychlorinated biphenyl

mg/kg - milligrams per kilogram

ng/kg - nanograms per kilogram

Total PCB is sum of PCB congeners where ND (U qualified values) are taken as zero.

Table D-39. Well/Piezometer Information and December 2021 Groundwater Elevations

Well ID	Northing (ft)	Easting (ft)	TOC Elevation (ft msl)	Date	Time	Depth to Water (ft)	Groundwater Elevation (ft msl)
1MW-1	259620.00	1558681.50	13.346	12/7/2021	9:45	5.50	7.85
1MW-4	260091.70	1558902.60	15.707	12/8/2021	13:33	6.14	9.57
MW1-2	259823.50	1558741.90	15.156	12/8/2021	10:28	6.95	8.21
MW1-3	259695.80	1559108.60	16.783	12/7/2021	14:48	2.91	13.87
MW1-4	259031.70	1558935.20	15.563	12/6/2021	12:50	6.31	9.25
MW1-5	259138.10	1558746.00	16.36	12/6/2021	14:55	8.20	8.16
MW1-6	259287.20	1558736.10	16.505	12/6/2021	10:45	8.19	8.32
MW1-09	259546.30	1558417.90	15.336	12/8/2021	13:08	6.05	9.29
MW1-10	259535.60	1558417.70	15.312	12/8/2021	12:23	4.71	10.60
MW1-11	259691.60	1559108.90	16.687	12/7/2021	15:57	51.51	-34.82
MW1-14	259823.60	1558873.00	17.877	12/8/2021	12:03	7.15	10.73
MW1-15	259560.40	1558848.50	16.575	12/7/2021	15:32	6.02	10.56
MW1-17	259499.60	1558679.60	12.725	12/6/2021	14:53	5.07	7.66
MW1-18	260036.50	1558861.90	15.361	12/8/2021	14:15	6.15	9.21
MW1-20	259059.70	1559112.80	13.748	12/7/2021	12:48	3.63	10.12
MW1-23	260443.50	1558863.20	19.305	12/8/2021	11:08	9.14	10.17
MW1-24	260259.30	1559041.40	16.927	12/8/2021	11:23	4.84	12.09
MW1-25	259891.10	1558671.40	15.269	12/8/2021	13:47	7.27	8.00
MW1-27	259691.38	1559104.23	16.453	12/7/2021	15:48	4.60	11.85
MW1-28	259783.90	1558591.77	16.518	12/8/2021	13:51	8.86	7.66
MW1-29	259676.50	1558514.10	16.048	12/8/2021	14:11	8.45	7.60
MW1-31	259431.50	1559138.40	15.996	12/7/2021	14:54	4.56	11.44
MW1-38	260261.87	1558354.67	13.231	12/8/2021	10:08	2.30	10.93
MW1-39	260266.50	1558358.03	13.218	12/8/2021	10:00	2.49	10.73
MW1-41	259731.50	1558880.50	18.512	12/8/2021	12:10	7.42	11.09
MW1-42	259497.02	1198819.77	12.77	12/7/2021	10:07	3.36	9.41
MW1-43	259456.23	1198809.41	12.69	12/6/2021	15:31	3.60	9.09
MW1-44	259394.52	1198806.50	12.24	12/6/2021	13:47	3.56	8.68
MW1-45	259325.26	1198822.32	12.99	12/7/2021	11:22	5.16	7.83
MW1-46	259508.60	1199026.27	16.71	12/7/2021	14:08	7.02	9.69
MW1-47	259466.25	1199023.85	16.44	12/7/2021	12:48	6.11	10.33
MW1-48	259416.03	1199082.01	15.8	12/6/2021	12:48	5.35	10.45
MW1-49	258986.91	1198907.63	14.17	12/6/2021	16:12	5.81	8.36
MW1-50	258988.47	1198967.28	16.75	12/7/2021	13:09	7.85	8.90
MW1-51	259088.54	1198979.37	17.23	12/6/2021	13:48	8.15	9.08
MW1-52	259050.35	1199004.93	17.11	12/6/2021	12:23	7.98	9.13
MW1-53	259067.70	1199065.84	13.4	12/6/2021	13:08	4.30	9.10
MW1-54	258949.79	1199050.16	15.57	12/6/2021	13:37	5.31	10.26
MW1-55	258977.68	1199101.47	15.6	12/6/2021	11:39	4.92	10.68
MW1-56, CH1	258984.05	1199144.30	15.82	12/7/2021	9:45	5.53	10.29
MW1-56, CH2	258984.05	1199144.30	15.82	12/7/2021	10:49	4.81	11.01
MW1-58, CH0	259057.79	1199138.21	16.84	12/7/2021	10:03	6.05	10.79
MW1-58, CH1	259057.79	1199138.21	16.84	12/7/2021	13:20	6.50	10.34
MW1-58, CH2	259057.79	1199138.21	16.84	12/7/2021	11:04	6.43	10.41
MW1-59	258934.36	1198963.99	12.68	12/7/2021	12:15	1.15	11.53
MW1-60	259345.11	1198555.91	18.01	12/8/2021	12:31	9.38	8.63
MW1-61	259195.56	1199035.84	13.47	12/6/2021	11:40	4.82	8.65
MW1-62	259592.91	1198976.33	19.46	12/7/2021	10:54	9.38	10.08
MW1-63	259664.43	1198921.44	18.17	12/7/2021	13:30	8.31	9.86
MW1-64	259759.23	1198871.21	17.13	12/8/2021	9:50	7.49	9.64
MW1-65	259780.55	1198937.41	16.77	12/8/2021	10:12	7.11	9.66
MW1-67	259780.68	1198935.04	16.6	12/8/2021	10:49	8.04	8.56
MW1-68	259010.62	1199148.31	14.99	12/6/2021	10:57	2.76	12.23
P1-01	259792.50	1558893.20	17.621	12/8/2021	11:32	7.09	10.53
P1-02	259769.50	1558825.70	17.031	12/7/2021	16:10	7.66	9.37
P1-03	259745.10	1558770.10	15.989	12/7/2021	14:33	7.65	8.34
P1-04	259665.80	1558755.50	15.824	12/7/2021	11:44	6.45	9.37
P1-09	259047.60	1558900.60	15.151	12/6/2021	15:54	6.22	8.93

Table D-40. Groundwater Field Parameters, December 2021

Well ID	Temperature (°C)	pH (S.U)	ORP (mv)	Spec. Cond. (ms/cm)	Turbidity (NTU)	DO (mg/L)	Salinity (ppt)
1MW-1	12.80	6.15	-3.20	0.24	7.97	0.16	0.12
1MW-4	13.00	7.03	-41.90	0.99	4.33	0.09	0.49
MW1-2	11.50	6.78	14.10	0.67	14.26	0.33	0.33
MW1-3	14.30	5.89	40.80	0.14	4.59	5.19	0.07
MW1-4	11.40	8.46	147.00	0.26	5.48	2.89	0.12
MW1-5	11.60	6.39	-66.90	0.32	30.34	3.87	0.15
MW1-6	13.50	6.37	39.80	0.76	33.46	0.11	0.38
MW1-09	12.10	7.03	-89.20	0.76	55.49	3.47	0.38
MW1-10	12.10	6.27	38.30	0.20	31.12	4.87	0.09
MW1-11	14.60	6.15	90.80	0.22	36.97	0.36	0.11
MW1-14	11.60	6.28	-30.40	0.65	12.97	0.48	0.32
MW1-15	16.70	6.20	-36.00	0.66	1.88	0.41	0.32
MW1-17	11.30	6.82	-80.90	0.46	7.37	0.38	0.22
MW1-18	10.90	6.62	-12.80	0.31	89.98	0.15	0.15
MW1-20	14.30	6.45	11.60	0.50	11.77	3.44	0.23
MW1-23	13.20	7.66	127.70	0.26	20.09	0.49	0.13
MW1-24	14.60	7.00	-95.40	0.22	106.75	3.18	0.11
MW1-25	12.10	6.79	13.70	0.99	2.23	0.49	0.49
MW1-27	15.20	6.76	-81.40	0.16	28.51	3.20	0.08
MW1-28	11.70	7.12	52.70	1.40	12.07	0.47	0.71
MW1-29	11.90	7.20	-68.60	2.15	10.01	3.46	1.11
MW1-31	15.60	6.14	85.00	0.23	17.69	0.29	0.11
MW1-38	13.40	7.66	-106.50	0.76	14.81	3.34	0.37
MW1-39	13.30	8.30	75.80	0.37	12.22	0.48	0.18
MW1-41	12.30	6.40	-38.00	0.90	5.92	0.07	0.45
MW1-42	15.00	7.40	-84.50	0.38	3.95	0.46	0.18
MW1-43	12.70	7.56	-116.20	1.96	7.34	0.45	1.02
MW1-44	4.05	12.90	8.65	-59.50	1.69	3.00	0.86
MW1-45	14.20	8.95	-82.50	0.73	6.66	0.42	0.36
MW1-46	15.60	7.13	-58.40	1.18	1.68	0.47	0.59
MW1-47	15.00	6.26	-29.10	0.59	6.00	0.46	0.29
MW1-48	15.70	6.32	-40.10	0.71	28.83	0.37	0.35
MW1-49	11.70	7.38	-28.40	0.26	2.84	3.88	0.12
MW1-50	11.60	7.45	85.80	0.23	8.01	0.29	0.11
MW1-51	11.40	8.55	10.50	0.29	3.59	3.86	0.14
MW1-52	11.00	8.52	-43.20	0.30	6.96	3.98	0.15
MW1-53	11.50	8.04	17.60	0.35	7.85	3.93	0.17
MW1-54	10.90	7.66	158.70	0.20	10.77	1.47	0.10
MW1-55	11.20	7.64	137.00	0.25	12.14	0.60	0.12
MW1-56, CH1	11.50	6.73	25.00	0.55	8.77	0.41	0.27
MW1-56, CH2	12.10	6.71	58.90	0.43	11.48	0.30	0.21
MW1-58, CH0	12.40	7.20	-127.00	0.32	46.50	3.67	0.15
MW1-58, CH1	11.60	6.36	158.10	0.89	541.24	7.49	0.44
MW1-58, CH2	13.20	6.60	-59.50	0.32	64.97	3.52	0.15
MW1-59	10.10	7.54	103.80	0.24	30.12	0.37	0.12
MW1-60	11.60	7.66	116.10	0.30	21.87	0.58	0.14
MW1-61	14.30	7.03	5.70	0.39	5.22	0.48	0.19
MW1-62	13.70	6.67	19.80	0.52	16.03	0.12	0.25
MW1-63	13.00	6.70	-21.00	0.95	10.07	0.08	0.47
MW1-64	11.50	6.69	-11.20	0.88	6.64	0.09	0.44
MW1-65	11.60	6.74	-35.90	0.80	8.54	0.47	0.40
MW1-67	11.00	6.79	-78.40	0.85	4.24	0.50	0.42
MW1-68	12.20	7.24	-118.90	0.28	131.28	3.82	0.13
P1-01	11.90	6.36	-44.30	0.83	13.89	0.06	0.41
P1-02	11.50	6.38	-23.00	1.72	32.23	0.05	0.87
P1-03	13.10	6.34	-25.00	0.78	4.11	0.09	0.38
P1-04	13.00	6.84	-28.90	0.68	4.20	0.13	0.33
P1-09	11.40	8.06	70.10	0.26	0.18	0.31	0.12

Notes:
°C = degrees Celsius
DO = dissolved oxygen
mg/L = milligrams per liter
ms/cm = milliSiemens per centimeter
mV = millivolts
ppt = parts per thousand
Spec. Cond. = specific conductivity
S.U. = standard units

Table D-41. Groundwater Analytical Results, December 2021

		Analyte	HFPO-DA		NEtFOSAA		NMeFOSAA		PFBS		PFDA		PFDoA		PFHpA		PFHxS		PFHxA		PFNA		PFOS		PFOA		PFTA		PFTrDA		PFUnA		11Cl-PF3OUdS		9Cl-PF3ONS		DONA	
		Screening Level	NS		NS		NS		0.60 [1]		NS		NS		NS		NS		NS		NS		0.040 [2]		0.040 [2]		NS		NS		NS		NS		NS		NS	
		2022 Screening Level [3]	0.0060 [1]		NS		NS		0.60 [1]		NS		NS		NS		0.039 [1]		NS		0.0060 [1]		0.0040 [1]		0.0060 [2]		NS		NS		NS		NS		NS		NS	
		Unit	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Well	Sample ID	Sample Date	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
1MW-1	GM-21-001	7-Dec-2021	0.00089	U	0.0014	J	0.0011	U	0.0015	J	0.00047	J	0.00089	U	0.0025		0.012		0.0045		0.00079	J	0.020		0.030		0.00089	U	0.00089	U	0.00089	U	0.00089	U	0.00089	U	0.00089	U
1MW-4	GM-21-002	8-Dec-2021	0.00052	J	0.00088	U	0.0011	U	0.0011	J	0.00088	U	0.00089	U	0.00099	J	0.00067	J	0.0023		0.00088	U	0.00088	U	0.0035		R		0.00089	U	0.00088	U	0.00088	U	0.00088	U	0.00088	U
1MW-4 (DUP)	GM-21-003	8-Dec-2021	0.00046	J	0.00088	U	0.0011	U	0.0012	J	0.00088	U	0.00088	U	0.00082	J	0.00069	J	0.0023		0.00088	U	0.00088	U	0.0037		0.00088	UJ	0.00088	U	0.00088	U	0.00088	U	0.00088	U	0.00088	U
MW1-02	GM-21-004	8-Dec-2021	0.00085	U	0.00085	U	0.0010	U	0.0014	J	0.00085	U	0.00085	U	0.0053		0.0026		0.011		0.0013	J	0.0025		0.014		0.00085	UJ	0.00085	U	0.00085	U	0.00085	U	0.00085	U	0.00085	U
MW1-03	GM-21-005	7-Dec-2021	0.00089	U	0.00089	U	0.0011	U	0.0024		0.00089	U	0.00089	U	0.0011	J	0.0024		0.00051	J	0.00089	U	0.0015	J	0.0028		0.00089	U	0.00089	U	0.00089	U	0.00089	U	0.00089	U	0.00089	U
MW1-04	GM-21-006	6-Dec-2021	0.0009	U	0.0009	U	0.0011	U	0.00090	U	0.00090	UJ	0.00090	U	0.00090	U	0.00090	U	0.00090	U	0.00090	U	0.00090	U	0.00090	U	0.00090	U	0.00090	U	0.00090	U	0.00090	UJ	0.00090	U	0.00090	U
MW1-05	GM-21-007	6-Dec-2021	0.00089	J	0.00090	U	0.0011	U	0.00080	J	0.00090	UJ	0.00090	U	0.00059	J	0.0023	J	0.00077	J	0.00090	U	0.0044	J	0.0020	J	0.00090	U	0.00090	U	0.00090	U	0.00090	UJ	0.00090	U	0.00090	U
MW1-06	GM-21-008	6-Dec-2021	0.0021	J	0.00094	U	0.0011	U	0.0051	J	0.00094	UJ	0.00094	U	0.0076	J	0.051	J	0.023	J	0.00091	J	**0.16**	J	**0.12**	J	R		0.00094	U	0.00094	U	0.00094	UJ	0.00094	U	0.00094	U
MW1-09	GM-21-009	8-Dec-2021	0.00089	U	0.00089	U	0.0011	U	0.00060	J	0.00089	U	0.00091	U	0.00089	U	0.00089	U	0.00089	U	0.00089	U	0.00048	J	0.0012	J	0.00091	UJ	0.00091	U	0.00091	U	0.00089	U	0.00089	U	0.00089	U
MW1-10	GM-21-010	8-Dec-2021	0.00087	U	0.00087	U	0.0010	U	0.00049	J	0.00087	U	0.00087	UJ	0.00087	U	0.00087	U	0.00087	U	0.00087	U	0.00068	J	0.00067	J	0.00087	UJ	0.00087	UJ	0.00087	U	0.00087	U	0.00087	U	0.00087	U
MW1-11	GM-21-011	7-Dec-2021	0.00091	U	0.00091	U	0.0011	U	0.00091	U	0.00091	U	0.00091	U	0.00091	U	0.00091	U	0.00091	U	0.00091	U	0.00088	J	0.00091	U	0.00091	UJ	0.00091	U	0.00091	U	0.00091	U	0.00091	U	0.00091	U
MW1-11 (DUP)	GM-21-012	7-Dec-2021	0.00054	J	0.00093	U	0.0011	U	0.00093	U	0.00093	UJ	0.00093	UJ	0.00093	U	0.00093	U	0.00093	U	0.00093	U	0.00096	J	0.00093	U	R		0.00093	UJ	0.00093	U	0.00093	U	0.00093	U	0.00093	U
MW1-14	GM-21-013	8-Dec-2021	0.0020	J	0.00092	U	0.0011	U	0.00093	J	0.00092	U	0.00092	U	0.0024		0.0024		0.0051		0.00049	J	0.0053		0.0098		R		0.00092	U	0.00092	U	0.00092	U	0.00092	U	0.00092	U
MW1-15	GM-21-014	7-Dec-2021	0.00096	U	0.00096	UJ	0.0012	UJ	0.0026	J	0.00096	UJ	R		0.0026	J	0.0085		0.0037	J	0.00065	J	0.014	J	0.020	J	R		R		R		0.00096	U	0.00096	U	0.00096	U
MW1-17	GM-21-015	6-Dec-2021	0.00050	J	0.0036	J	0.00090	J	0.00076	J	0.00093	UJ	0.00093	U	0.0012	J	0.0076	J	0.0023	J	0.00052	J	0.015	J	0.017	J	0.00093	UJ	0.00093	U	0.00093	U	0.00093	UJ	0.00093	U	0.00093	U
MW1-18	GM-21-016	8-Dec-2021	0.00090	U	R		R		0.0013	J	R		R		0.00056	J	0.0011	J	0.00085	J	R		R		0.0015	J	R		R		R		R		R		0.00090	U
MW1-20	GM-21-018	7-Dec-2021	0.00086	U	0.00086	U	0.0010	U	0.00047	J	0.00086	U	0.00086	U	0.00086	U	0.00066	J	0.00086	U	0.00086	U	0.0026		0.00059	J	0.00086	U	0.00086	U	0.00086	U	0.00086	U	0.00086	U	0.00086	U
MW1-23	GM-21-019	8-Dec-2021	0.00093	U	0.00093	U	0.0011	U	0.00053	J	0.00093	U	0.00093	U	0.00093	U	0.00093	U	0.00093	U	0.00093	U	0.00093	U	0.00093	U	0.00092	U	0.00093	U	0.00093	U	0.00093	U	0.00093	U	0.00093	U
MW1-24	GM-21-020	8-Dec-2021	0.00086	U	0.00086	U	0.0010	U	0.00086	U	0.00086	U	0.00086	U	0.00086	U	0.00086	U	0.00086	U	0.00086	U	0.00086	U	0.00086	U	R		0.00086	U	0.00086	U	0.00086	U	0.00086	U	0.00086	U
MW1-24 (DUP)	GM-21-021	8-Dec-2021	0.00086	U	0.00086	U	0.0010	U	0.00086	U	0.00086	U	0.00086	U	0.00086	U	0.00086	U	0.00086	U	0.00086	U	0.00086	U	0.00086	U	0.00086	UJ	0.00086	U	0.00086	U	0.00086	U	0.00086	U	0.00086	U
MW1-25	GM-21-022	8-Dec-2021	0.00097	U	0.00097	UJ	0.0012	UJ	0.0010	J	0.00097	UJ	R		0.0011	J	0.0017	J	0.0018	J	0.00097	U	0.0026	J	0.0035	J	R		R		0.00097	UJ	0.00097	U	0.00097	U	0.00097	U
MW1-27	GM-21-023	7-Dec-2021	0.00091	U	0.00091	U	0.0011	U	0.00091	U	0.00091	U	0.00091	UJ	0.00091	U	0.00091	U	0.00091	U	0.00091	U	0.00091	U	0.00091	U	R		R		0.00091	UJ	R		0.00091	U	0.00091	U
MW1-28	GM-21-024	8-Dec-2021	0.00091	U	0.00091	U	0.0011	U	0.00058	J	0.00091	U	0.00091	UJ	0.0009	J	0.0012	J	0.0017	J	0.00091	U	0.0013	J	0.0030		R		0.00091	UJ	0.00091	UJ	0.00091	U	0.00091	U	0.00091	U
MW1-29	GM-21-025	8-Dec-2021	0.00096	U	0.00096	U	0.0012	U	0.00096	U	0.00096	U	0.00096	U	0.00096	U	0.00096	U	0.00096	U	0.00096	U	0.00096	U	0.00096	U	0.00096	UJ	0.00096	U	0.00096	U	0.00096	U	0.00096	U	0.00096	U
MW1-31	GM-21-026	7-Dec-2021	0.00089	UJ	0.00089	UJ	0.0011	UJ	0.0014	J	0.00089	UJ	0.00089	UJ	0.00089	UJ	0.00073	J	0.00089	UJ	0.00057	J	0.0022	J	0.0007	J	0.0009	UJ	0.00089	UJ	0.00089	UJ	0.00089	UJ	0.00089	UJ	0.00089	UJ
MW1-38	GM-21-027	8-Dec-2021	0.00088	U	0.00088	U	0.0011	U	0.00062	J	0.00088	U	0.00088	U	0.00088	U	0.0008	J	0.00059	J	0.00088	U	0.00088	U	0.0011	J	0.00088	U	0.00088	U	0.00088	U	0.00088	U	0.00088	U	0.00088	U
MW1-39	GM-21-028	8-Dec-2021	0.00094	U	0.00094	U	0.0011	U	0.00055	J	0.00094	U	0.00094	U	0.00094	U	0.00094	U	0.00094	U	0.00094	U	0.00094	U	0.00094	U	0.00094	U	0.00094	U	0.00094	U	0.00094	U	0.00094	U	0.00094	U
MW1-41	GM-21-029	8-Dec-2021	0.00068	J	0.00088	U	0.0011	U	0.00092	J	0.00088	U	0.00088	UJ	0.0029		0.0020		0.0050		0.00060	J	0.0044		0.0099		R		0.00088	UJ	0.00088	U	0.00088	U	0.00088	U	0.00088	U
MW1-42	GM-21-030	7-Dec-2021	0.00098	UJ	0.00098	UJ	0.0012	UJ	0.0012	J	0.00062	J	0.00098	UJ	0.0021	J	0.0021	J	0.0031	J	0.0011	J	0.0062	J	0.0074	J	R		0.00098	UJ	0.00098	UJ	0.00098	UJ	0.00098	UJ	0.00098	UJ
MW1-43	GM-21-031	6-Dec-2021	0.00090	U	0.00090	U	0.0011	U	0.00095	J	0.00090	UJ	0.00090	U	0.0013	J	0.0026	J	0.0022	J	0.00048	J	0.0023	J	0.0051	J	0.00090	U	0.00090	U	0.00090	U	0.00090	UJ	0.00090	U	0.00090	U
MW1-44	GM-21-032	6-Dec-2021	0.00091	U	0.00091	U	0.0011	U	0.0018	J	0.00091	UJ	0.00091	U	0.00075	J	0.0074	J	0.0014	J	0.0009	UJ	0.0012	J	0.0024	J	0.00091	U	0.00091	U	0.00091	U	0.00091	UJ	0.00091	U	0.00091	U
MW1-45	GM-21-033	7-Dec-2021	0.00096	U	0.00096	U	0.0012	U	0.0011	J	0.00096	U	0.00096	U	0.00068	J	0.0026	J	0.0011	J	0.00096	U	0.00065	J	0.0019		0.00096	U	0.00096	U	0.00096	U	0.00096	U	0.00096	U	0.00096	U
MW1-45 (DUP)	GM-21-034	7-Dec-2021	0.00094	UJ	0.00094	UJ	0.0011	UJ	0.0015	J	0.00094	UJ	0.00094	UJ	0.00070	J	0.0055	J	0.0015	J	0.00094	UJ	0.0026	J	0.0027	J	0.00094	UJ	0.00094	UJ	0.00094	UJ	0.00095	UJ	0.00094	UJ	0.00094	UJ
MW1-46	GM-21-035	7-Dec-2021	0.00092	U	0.00092	U	0.0011	U	0.00060	J	0.00092	U	0.00092	U	0.00049	J	0.0011	J	0.0012	J	0.00092	U	0.00084	J	0.0018		0.00092	U	0.00092	U	0.00092	U	0.00092	U	0.00092	U	0.00092	U
MW1-47	GM-21-036	7-Dec-2021	0.00095	U	0.00082	J	0.0011	U	0.0028	J	0.00054	J	0.00095	U	0.0030		0.0044		0.0057		0.0013	J	0.016		0.021		0.00095	U	0.00095	U	0.00095	U	0.00095	U	0.00095	U	0.00095	U
MW1-48	GM-21-037	6-Dec-2021	0.00099	UJ	0.0027	J	0.0012	UJ	0.0023	J	0.00088	J	0.00099	UJ	0.0032	J	0.0033	J	0.0054	J	0.0015	J	0.012	J	0.0096	J	0.00099	UJ	0.00099	UJ	0.00099	UJ	0.00099	UJ	0.00099	UJ	0.00099	UJ
MW1-49	GM-21-038	6-Dec-2021	0.00088	U	0.00088	U	0.0011	U	0.00088	U	0.00088	UJ	0.00088	U	0.00088	U	0.00088	U	0.00088	U	0.00088	U	0.00056	J	0.00088	U	0.00088	U	0.00088	U	0.00088	U	0.00088	UJ	0.00088	U	0.00088	U
MW1-50	GM-21-039	7-Dec-2021	0.00092	UJ	0.00092	UJ	0.0011	UJ	0.00078	J	0.00092	UJ	0.00092	UJ	0.00092	UJ	0.00092	UJ	0.00092	UJ	0.00092	UJ	0.00092	UJ	0.00092	UJ	0.00092	UJ	0.00092	UJ	0.00092	UJ	0.00092	UJ	0.00092	UJ	0.00092	UJ
MW1-51	GM-21-040	6-Dec-2021	0.00089	U	0.00089	U	0.0011	U	0.00089	U	0.00089	UJ	0.00089	U	0.00089	U	0.00089	U	0.00089	U	0.00089	U	0.00089	U	0.00057	J	0.00089	U	0.00089	U	0.00089	U	0.00089	UJ	0.00089	U	0.00089	U
MW1-52	GM-21-041	6-Dec-2021	0.00090	U	0.00090	U	0.0011	U	0.00090	U	0.00090	UJ	0.00090	U	0.00090	U	0.00090	U	0.00050	J	0.00090	U	0.00090	U	0.00082	J	0.00090	U	0.00090	U	0.00090	U	0.00090	UJ	0.00090	U	0.00090	U
MW1-53	GM-21-042	6-Dec-2021	0.00090	U	0.00090	U	0.0011	U	0.00057	J	0.00090	UJ	0.00090	U	0.0016	J	0.00098	J	0.0023	J	0.00060	J	0.0024	J	0.0039	J	0.00090	U	0.00090	U	0.00090	U	0.00090	UJ	0.00090	U	0.00090	U
MW1-54	GM-21-043	6-Dec-2021	0.00091	U	0.00091	U	0.0011	U	0.0070	J	0.00091	UJ	0.00091	U	0.00091	U	0.00091	U	0.00091	U	0.00091	U	0.00091	U	0.00091	U	0.00091	UJ	0.00091	U	0.00091	U	0.00091	UJ	0.00091	U	0.00091	U
MW1-55	GM-21-044	6-Dec-2021	0.00091	U	0.00091	U	0.0011	U	0.00091	U	0.00091	UJ	0.00091	UJ	0.00091	U	0.00091	U	0.00091	U	0.00091	U	0.00091	U	0.00091	U	0.00091	UJ	0.00091	U	0.00091	U	0.00091	UJ	0.00091	U	0.00091	U
MW1-56, CH2	GM-21-045	7-Dec-2021	0.00091	U	0.00091	U	0.0011	U	0.0026		0.00091	U	0.00091	U	0.00091	J	0.011		0.0027		0.00091	U	0.0084		0.0023		0.00091	UJ	0.00091	U	0.00091	U	0.00091	U	0.00091	U	0.00091	U
MW1-56, CH1	GM-21-046	7-Dec-2021	0.00071	J	0.00092	UJ	0.0011	UJ	0.0014	J	0.00047	J	R		0.0017	J	0.0053		0.0028		0.0005	J	0.0086		0.0038		R		R		R		0.00092	U	0.00092	U	0.00092	U
MW1-58, CH2	GM-21-048	7-Dec-2021	0.00092	U	0.00092	U	0.0011	U	0.0012	J	0.00064	J	0.00092	U	0.0021		0.0018		0.0033		0.00093	J	0.0060		0.0046		R		0.00092	U	0.00092	U	0.00092	U	0.00092	U	0.00092	U
MW1-58, CH1	GM-21-049	7-Dec-2021	0.0061	J	0.00095	U	0.0011	U	0.0020	J	0.00095	U	0.00095	U	0.0022		0.0023		0.0056	J	0.0006	J	0.0048	J	0.0061		0.00095	UJ	0.00095	U	0.00095	U	0.00095	U	0.00095	U	0.00095	U
MW1-58, CH0	GM-21-050	7-Dec-2021	0.00092	U	0.00092	UJ	0.0011	UJ	0.00092	U	0.00092	U	R		0.00092	U	0.00068	J	0.00092	U	0.00092	U	0.00092	U	0.00092	U	R		R		0.00092	UJ	0.00092	U	0.00092	U	0.00092	U
MW1-59	GM-21-051	7-Dec-2021	0.00091	U	0.00091	UJ	0.0011	U	0.00091	U	0.00091	U	0.00091	UJ	0.00091	U	0.00091	U	0.00091	U	0.00091	U	0.00091	U	0.00091	U	R		0.00091	UJ	0.00091	U	0.00091	U	0.00091	U	0.00091	U
MW1-60	GM-21-052	8-Dec-2021	0.00092	U	0.00092	U	0.0011	U	0.00092	U	0.00092	U	0.00092	U	0.00092	U	0.00092	U	0.00092	U	0.00092	U	0.00092	U	0.00092	U	0.00092	UJ	0.00092	U	0.00092	U	0.00092	U	0.00092	U	0.00092	U
MW1-60 (DUP)	GM-21-053	8-Dec-2021	0.00093	U	0.00093	UJ	0.0011	UJ	0.00093	U	0.00093	U	R		0.00093	U	0.00093	U	0.00093	U	0.00093	U	0.00093	U	0.00093	U	R		R		0.00093	UJ	0.00093	U	0.00093	U	0.00093	U
MW1-61	GM-21-054	6-Dec-2021	0.00095	U	0.00095	U	0.0011	U	0.0012	J	0.00056	J	0.00095	U	0.0023	J	0.0016	J	0.0029	J	0.0010	J	0.0052	J	0.0064	J	0.00095	U	0.00095	U	0.00095	U	0.00095	UJ	0.00095	U	0.00095	U
MW1-62	GM-21-055	7-Dec-2021	0.00094	U	0.00094	UJ	0.0011	UJ	0.0010	J	0.00094	U	R		0.00054	J	0.0025		0.0016	J	0.00094	U	0.0034		0.0026		R		R		R		0.00094	UJ	0.00094	U	0.00094	U
MW1-63	GM-21-056	7-Dec-2021	0.00085	U	0.00085	U	0.0010	U	0.00085	J	0.00085	U	0.00085	U	0.0019		0.0024		0.0032		0.00085	U	0.0035		0.0073		0.00085	U	0.00085	UJ	0.00085	U	0.00085	UJ	0.00085	U	0.00085	U
MW1-64	GM-21-057	8-Dec-2021	0.00088	U	0.00088	U	0.0011	U	0.0011	J	0.00088	U	0.00088	UJ	0.0024		0.0024		0.0050		0.00088	U	0.0028		0.0065		R		0.00088	UJ	0.00088	UJ	0.00088	U	0.00088	U	0.00088	U
MW1-65	GM-21-058	8-Dec-2021	0.00092	U	0.00092	U	0.0011	U	0.0012	J	0.00092	U	0.00092	UJ	0.0014	J	0.0019		0.0050	J	0.00092	U	0.0019	J	0.0041		0.00092	UJ	0.00092	UJ	0.00092	U	0.00092	U	0.00092	U	0.00092	U

Table D-41. Groundwater Analytical Results, December 2021

		Analyte	HFPO-DA	NEtFOSAA	NMeFOSAA	PFBS	PFDA	PFDoA	PFHpA	PFHxS	PFHxA	PFNA	PFOS	PFOA	PFTA	PFTrDA	PFUnA	11Cl-PF3OUdS	9Cl-PF3ONS	DONA
		Screening Level	NS	NS	NS	0.60 [1]	NS	NS	NS	NS	NS	NS	0.040 [2]	0.040 [2]	NS	NS	NS	NS	NS	NS
		2022 Screening Level [3]	0.0060 [1]	NS	NS	0.60 [1]	NS	NS	NS	0.039 [1]	NS	0.0060 [1]	0.0040 [1]	0.0060 [1]	NS	NS	NS	NS	NS	NS
		Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Well	Sample ID	Sample Date	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q
MW1-67	GM-21-059	8-Dec-2021	0.0020 J	0.0011 J	0.0012 U	0.00098 J	0.00096 U	0.00096 U	0.0016 J	0.0042	0.0032	0.00096 U	0.012	0.018	0.00096 UJ	0.00096 U	0.00096 U	0.00096 U	0.00096 U	0.00096 U
MW1-68	GM-21-060	6-Dec-2021	0.00089 U	0.00089 U	0.0011 U	0.00075 J	0.00089 UJ	0.00089 U	0.00044 J	0.0011 J	0.0009 J	0.00089 U	0.0012 J	0.0016 J	0.00089 UJ	0.00089 U	0.00089 U	0.00089 UJ	0.00089 U	0.00089 U
P1-1	GM-21-061	8-Dec-2021	0.00075 J	0.00088 U	0.0011 U	0.00081 J	0.00088 U	0.00088 UJ	0.0051	0.0011 J	0.0097	0.00071 J	0.0028	0.013	R	0.00088 UJ	0.00088 U	0.00088 U	0.00088 U	0.00088 U
P1-2	GM-21-062	7-Dec-2021	0.0023 J	0.00093 U	0.0011 U	0.00049 J	0.00093 U	0.00093 U	0.0057	0.0018 J	0.014 J	0.00093 U	0.00093 U	0.023	0.00093 UJ	0.00093 U	0.00093 U	0.00093 U	0.00093 U	0.00093 U
P1-3	GM-21-063	7-Dec-2021	0.00091 UJ	0.00091 UJ	0.0011 UJ	0.0014 J	0.00091 UJ	0.00091 UJ	0.0031 J	0.0038 J	0.0053 J	0.00095 J	0.0058 J	0.017 J	R	0.00091 UJ	0.00091 UJ	0.00091 UJ	0.00091 UJ	0.00091 UJ
P1-3 (DUP)	GM-21-064	7-Dec-2021	0.0017 J	0.00053 J	0.0011 U	0.0012 J	0.00089 U	R	0.0028 J	0.0041 J	0.0054 J	0.00085 J	0.0062 J	0.017 J	R	R	0.00089 UJ	0.00089 U	0.00089 U	0.00089 U
P1-4	GM-21-065	7-Dec-2021	0.00087 UJ	0.00087 UJ	0.0010 UJ	0.00080 J	0.00087 UJ	R	0.0013 J	0.0015 J	0.0029 J	0.00087 UJ	0.0025 J	0.0042 J	R	R	R	0.00087 UJ	0.00087 UJ	0.00087 UJ
P1-9	GM-21-066	6-Dec-2021	0.00096 U	0.00096 U	0.0012 U	0.00096 U	0.00096 UJ	0.00096 U	0.00096 U	0.00096 U	0.00096 U	0.00096 U	0.00096 U	0.00096 U	0.00096 U	0.00096 U	0.00096 U	0.00096 UJ	0.00096 U	0.00096 U

Notes:

[1] Screening level is the EPA Regional Screening Level for tapwater (target hazard quotient [THQ] = 0.1), which is based on the protection of human health via drinking water only.

[2] The screening levels for PFOA and PFOS are calculated using the 2020 EPA online calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search) using the oral reference dose of 0.00002 milligrams per kilogram-day (THQ = 0.1).

[3] As discussed in Section 1.5 of this report, 2022 screening levels are presented only for the purpose of comparison. Analytical results from the December 2021 sampling event were not evaluated in comparison to these values.

Results that exceed the screening level are boldfaced and shaded grey.

µg/L = microgram(s) per liter

Data Qualifiers:

J = The reported result is an estimated value.

R = The result is rejected.

U = The analyte is not detected; the associated numerical value is the limit of detection or as qualified during data validation.

UJ = The analyte is not detected; the associated numerical value is approximate.

Analytes:

DONA = 4,8-dioxa-3H-perfluorononanoic acid
HFPO-DA = Hexafluoropropylene oxide dimer acid
NEtFOSAA = N-ethyl perfluorooctanesulfonamidoacetic acid
NMeFOSAA = N-methyl perfluorooctanesulfonamidoacetic acid
PFBS = Perfluorobutanesulfonic acid
PFDA = Perfluorodecanoic acid
PFDoA = Perfluorododecanoic acid
PFHpA = Perfluoroheptanoic acid
PFHxA = Perfluorohexanoic acid
PFHxS = Perfluorohexanesulfonic acid
PFNA = Perfluorononanoic acid
PFOA = Perfluorooctanoic acid
PFOS = Perfluorooctanesulfonic acid
PFTA = Perfluorotetradecanoic acid
PFTrDA = Perfluorotridecanoic acid
PFUnA = Perfluoroundecanoic acid
9Cl-PF3ONS = 9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
11Cl-PF3OUdS = 11-Chloroeicosafluoro-3-oxaundecane-1-sulfonicacid

Table D-42. Total Polychlorinated Biphenyls and Total Organic Carbon Analytical Data

		Analyte	Total PCBs		TOC		Total PCBs (Normalized)	
		Unit	ng/kg		mg/kg		mg/kg OC	
		PAL					12	
Location	Sample ID	Sample Date	Result	Q	Result	Q	Result	Q
DU1a	SI-1A-1	9/26/2023	688,000	J	45,000		**15**	
	SI-1A-2 (Duplicate)	9/26/2023	431,000	J	59,000		7.3	
	SI-1A-3 (Triplicate)	9/26/2023	2,040,000	J	40,000		**51**	
DU1b	SI-1B-1	9/26/2023	24,100	J	10,000		2.4	
	SI-1B-2 (Duplicate)	9/26/2023	12,700	J	16,000		0.79	
	SI-1B-3 (Triplicate)	9/26/2023	17,500	J	15,000		1.2	
DU2a	SI-2A-1	9/26/2023	360,000	J	24,000		**15**	
	SI-2A-2 (Duplicate)	9/26/2023	221,000	J	20,000		11	
	SI-2A-3 (Triplicate)	9/26/2023	226,000	J	29,000		7.8	
DU2b	SI-2B-1	9/25/2023	94,700	J	31,000		3.1	
	SI-2B-2 (Duplicate)	9/25/2023	105,000	J	44,000		2.4	
	SI-2B-3 (Triplicate)	9/25/2023	131,000	J	22,000		6.0	
DU3a	SI-3A-1	9/25/2023	24,100	J	15,000	J	1.6	
	SI-3A-2 (Duplicate)	9/25/2023	35,400	J	5,200	J	6.8	
	SI-3A-3 (Triplicate)	9/25/2023	25,100	J	6,000	J	4.2	
DU3b	SI-3B-1	9/25/2023	7,600	J	14,000	J	0.54	
	SI-3B-2 (Duplicate)	9/25/2023	39,400	J	5,300	J	7.4	
	SI-3B-3 (Triplicate)	9/25/2023	37,400	J	1,500	J	**25**	
DU4	SI-4-1	9/25/2023	63,000	J	30,000	J	2.1	
	SI-4-2 (Duplicate)	9/25/2023	101,000	J	110,000	J	0.92	
	SI-4-3 (Triplicate)	9/25/2023	197,000	J	78,000	J	2.5	
DU5	SI-5-1	9/25/2023	11,400	J	40,000	J	0.29	
	SI-5-2 (Duplicate)	9/25/2023	12,600	J	78,000	J	0.16	
	SI-5-3 (Triplicate)	9/25/2023	214,000	J	140,000	J	1.5	

Notes:

Detected results exceeding the PAL are boldfaced and shaded grey.

Total PCBs is the sum of detected congeners; zero is used for non-detected results (i.e., those qualified as "U").
mg/kg = milligram(s) per kilogram
ng/kg = nanogram(s) per kilogram
OC = organic carbon
PAL = Project Action Level
PCB = polychlorinated biphenyl
TOC = total organic carbon
Q = data qualifier
Data Qualifier:
J = The reported result is an estimated value.

Table D-43. 95% Upper Confidence Level Concentrations for Total Polychlorinated Biphenyls

Row #	IDs/Names of the Smaller DUs	DU Area (ft^2)	Replicate field sample concentrations (mg/kg OC)			Number of Replicates	Weight	Arithmetic Mean	SD of Replicates	Calculated SD of Increments	Calculated CV for the DU	Adjusted Factor	Adjusted SD of Increments	Adjusted CV for DU	SE of DU	95% UCL			
			Rep 1	Rep 2	Rep 3											Student's-t*	Chebychev	CV of Increments	95% UCL
1	DU1a	504	**15**	7.3	**51**	3	0.11	24	23.33	127.77	5.23	2.72	347.96	14.24	13.47	63.8	**83.1**	High	**83.1**
2	DU1b	504	2.4	0.79	1.2	3	0.11	1.5	0.84	4.58	3.13	1.66	7.61	5.20	0.48	2.9	3.6	High	3.6
3	DU2a	756	**15**	11	7.8	3	0.17	11	3.61	19.76	1.75	1.27	25.13	2.23	2.08	17.3	**20.3**	Med	**20.3**
4	DU2b	540	3.1	2.4	6.0	3	0.12	3.8	1.91	10.45	2.73	1.52	15.90	4.15	1.10	7.1	8.6	High	8.6
5	DU3a	450	1.6	6.8	4.2	3	0.10	4.2	2.60	14.24	3.39	1.76	25.08	5.97	1.50	8.6	10.7	High	10.7
6	DU3b	297	0.54	7.4	**25**	3	0.07	11	12.62	69.11	6.29	3.48	240.47	21.90	7.28	32.3	**42.7**	High	**42.7**
7	DU4	810	2.1	0.92	2.5	3	0.18	1.8	0.82	4.50	2.45	1.44	6.46	3.51	0.47	3.2	3.9	High	3.9
8	DU5	570	0.29	0.16	1.5	3	0.13	0.65	0.74	4.05	6.23	3.43	13.88	21.35	0.43	1.9	2.5	High	2.5
	Sum:	4431	--	--	--	24	1.00	6.9	2.88	15.78	2.28	NA	43.13	6.23	1.66	11.8	14.2	High	**14.2**

df by Welch-Satterthwaite approximation: **2.7** Recommended UCL: **14.2** mg/kg OC >> Chebyshev 95% UCL Note: Chebychev 95% UCL is recommended because the dispersion of the data is elevated.

Notes:

Orange Highlight = Individual DU outputs for CV and 95% UCL selected based on ITRC guidance

Purple Highlight = Combined DU outputs (weighted by DU area) for CV and 95% UCL selected based on ITRC guidance

Bold = Concentration exceeds 12 mg/kg OC project action level.

*Student's t UCL is acceptable if adjusted CV for DU is "Low" (e.g., CV ≤ 1.5). The User should consult the instructions for additional guidance on which 95% UCL is recommended for specific data sets.

CV = coefficient of variation
df = degrees of freedom
DU = decision unit
ft^2 = square foot (feet)
mg/kg OC = milligram(s) per kilogram organic carbon normalized
SD = arithmetic standard deviation
SE = standard error
95% UCL = 95% upper confidence limit for arithmetic mean

Table D-44. Causeway Groundwater Sampling Analytical Data

			Location ID		MW1-38		MW1-39		MW1-74		MW1-75		MW1-75 (DUP)	
			Sample Collection Date		24-Apr-2023		24-Apr-2023		24-Apr-2023		24-Apr-2023		24-Apr-2023	
Analyte	Project Action Level	Units												
Chlorinated Volatile Organic Compounds														
1,1,1-Trichloroethane	10,000	µg/L	0.070	U	0.070	U	0.070	U	0.070	U	0.070	U	0.070	U
1,1-Dichloroethane	8.9	µg/L	0.070	U	0.070	U	0.070	U	0.070	U	0.070	U	0.070	U
1,1-Dichloroethene	300	µg/L	0.070	U	0.070	U	0.070	U	0.070	U	0.070	U	0.070	U
1,2-Dichloroethane	8.9	µg/L	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U
cis-1,2-Dichloroethene	100	µg/L	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U
trans-1,2-Dichloroethene	100	µg/L	0.070	U	0.070	U	0.070	U	0.070	U	0.070	U	0.070	U
Chloroethane	8.9	µg/L	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
Tetrachloroethene	2.4	µg/L	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
Trichloroethene	0.30	µg/L	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U
Vinyl chloride	0.020	µg/L	0.090	U	**0.052**	J	0.090	U	0.090	U	0.090	U	0.090	U
Semivolatile Organic Compounds														
1,4-Dioxane	0.44	µg/L	0.052	U	0.051	U	0.051	U	0.050	U	0.050	U	0.050	U
Polycyclic Aromatic Hydrocarbons														
Acenaphthene	30	µg/L	0.031	U	0.012	J	0.027	J	0.031	U	0.030	U		
Acenaphthylene	30	µg/L	0.031	U	0.014	J	0.018	J	0.031	U	0.030	U		
Anthracene	100	µg/L	0.031	U	0.031	U	0.027	J	0.031	U	0.030	U		
Benzo(a)pyrene	0.000016	µg/L	0.031	U	0.031	U	**0.013**	J	0.031	U	0.030	U		
Benzo(a)anthracene	0.00016	µg/L	0.031	U	0.031	U	**0.020**	J	0.031	U	0.030	U		
Benzo(b)fluoranthene	0.00016	µg/L	0.031	U	**0.012**	J	**0.016**	J	0.031	U	0.030	U		
Benzo(g,h,i)perylene	8.0	µg/L	0.031	U	0.011	J	0.014	J	0.031	U	0.030	U		
Benzo(k)fluoranthene	0.0016	µg/L	0.031	U	0.031	U	**0.019**	J	0.031	U	0.030	U		
Chrysene	0.016	µg/L	0.031	U	0.031	U	**0.020**	J	0.031	U	0.030	U		
Dibenz(a,h)anthracene	0.000016	µg/L	0.041	U	0.042	U	0.041	U	0.041	U	0.040	U		
Fluoranthene	6.0	µg/L	0.031	U	0.031	U	0.027	J	0.031	U	0.030	U		
Fluorene	10	µg/L	0.031	U	0.011	J	0.032	J	0.031	U	0.030	U		
Indeno(1,2,3-c,d)pyrene	0.00016	µg/L	0.041	U	0.042	U	0.041	U	0.041	U	0.040	U		
2-Methylnaphthalene	4,900	µg/L	0.041	U	0.028	J	0.039	J	0.041	U	0.040	U		
Naphthalene	4,900	µg/L	0.062	U	0.062	U	0.036	J	0.061	U	0.061	U		
Phenanthrene	100	µg/L	0.062	U	0.062	U	0.061	U	0.061	U	0.061	U		
Pyrene	8.0	µg/L	0.031	U	0.031	U	0.026	J	0.031	U	0.030	U		
Carcinogenic PAH Total TEQ[2]	0.000016	µg/L	0		**0.0012**		**0.019**		0		0			
PCB Aroclors														
Aroclor 1016	0.0030	µg/L	0.21	U	0.20	U	0.20	U	0.20	U	0.20	U		
Aroclor 1221	NS	µg/L	0.21	U	0.20	U	0.20	U	0.20	U	0.20	U		
Aroclor 1232	NS	µg/L	0.21	U	0.20	U	0.20	U	0.20	U	0.20	U		

Table D-44. Causeway Groundwater Sampling Analytical Data

		Location ID	MW1-38		MW1-39		MW1-74		MW1-75		MW1-75 (DUP)	
		Sample Collection Date	24-Apr-2023		24-Apr-2023		24-Apr-2023		24-Apr-2023		24-Apr-2023	
Analyte	Project Action Level	Units										
Aroclor 1242	NS	µg/L	0.21	U	0.20	U	0.20	U	0.20	U	0.20	U
Aroclor 1248	NS	µg/L	0.21	U	0.20	U	0.20	U	0.20	U	0.20	U
Aroclor 1254	0.00010	µg/L	0.21	U	0.20	U	0.20	U	0.20	U	0.20	U
Aroclor 1260	NS	µg/L	0.21	U	0.20	U	0.20	U	0.20	U	0.20	U
Aroclor 1262	NS	µg/L	0.21	U	0.20	U	0.20	U	0.20	U	0.20	U
Aroclor 1268	NS	µg/L	0.21	U	0.20	U	0.20	U	0.20	U	0.20	U
Total PCB Aroclors	0.0000070	µg/L	0.21	U	0.20	U	0.20	U	0.20	U	0.20	U
Metals, Total												
Antimony	5.6	µg/L	0.50	U	0.30	J	0.50	U	0.28	J	0.27	J
Arsenic	0.018	µg/L	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U
Beryllium	270	µg/L	0.30	U	0.30	U	0.30	U	0.30	U	0.30	U
Cadmium	0.72	µg/L	0.24	J	**1.7**		0.40	U	0.40	U	0.40	U
Chromium	10	µg/L	2.1		0.80	U	0.80	U	2.4	J+	2.5	
Lead	2.5	µg/L	0.18	J	0.17	J	0.20	U	0.18	J	0.15	J
Manganese	50	µg/L	**58**		8.6		**840**		16		15	
Mercury	0.012	µg/L	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U
Nickel	8.2	µg/L	0.59	J	0.80	U	0.80	U	0.80	U	0.80	U
Thallium	0.22	µg/L	0.30	U	0.30	U	0.30	U	0.15	J	0.30	U
Zinc	81	µg/L	8.0	U	60		8	U	8	U	4.1	J
Per-and polyfluoroalkyl substances												
Perfluorobutanoic acid	NS	µg/L	0.0024	J	0.0047	J	0.0011	J	0.0031	U	0.0031	U
Perfluoropentanoic acid	NS	µg/L	0.0076		0.0014	J	0.0015	U	0.0016	U	0.0016	U
Perfluorohexanoic acid	NS	µg/L	0.0051		0.0020		0.0012	U	0.00054	J	0.0013	U
Perfluoroheptanoic acid	NS	µg/L	0.0014	J	0.0011	J	0.0012	U	0.0012	U	0.0013	U
Perfluorooctanoic acid (PFOA)	0.0060[1]	µg/L	0.0011	J	0.0012	J	0.00077	U	0.0011	J	0.00076	J
Perfluorononanoic acid	0.0060[1]	µg/L	0.0016	U	0.0016	U	0.0015	U	0.0016	U	0.0016	U
Perfluorodecanoic acid	NS	µg/L	0.0024	U	0.0024	U	0.0023	U	0.0023	U	0.0024	U
Perfluoroundecanoic acid	NS	µg/L	0.0013	U	0.0013	U	0.0012	U	0.0012	U	0.0013	U
Perfluorododecanoic acid	NS	µg/L	0.0013	U	0.0013	U	0.0012	U	0.0012	U	0.0013	U
Perfluorotridecanoic acid	NS	µg/L	0.0013	U	0.0013	U	0.0012	U	0.0012	U	0.0013	U
Perfluorotetradecanoic acid	NS	µg/L	0.0013	U	0.0013	U	0.0012	U	0.0012	U	0.0013	U
Perfluorobutanesulfonic acid (PFBS)	0.601	µg/L	0.0003	J	0.00047	J	0.00068	U	0.00038	J	0.00069	U
Perfluoropentanesulfonic acid	NS	µg/L	0.00074	U	0.00075	U	0.00072	U	0.00073	U	0.00074	U
Perfluorohexanesulfonic acid	0.039[1]	µg/L	0.00076	J	0.0012	U	0.0011	U	0.0010	J	0.0012	J
Perfluoroheptanesulfonic acid	NS	µg/L	0.0012	U	0.0012	U	0.0012	U	0.0012	U	0.0012	U
Perfluorooctanesulfonic acid (PFOS)	0.0040[1]	µg/L	0.0012	U	0.00094	J	0.0011	U	0.0012	U	0.0012	U

Table D-44. Causeway Groundwater Sampling Analytical Data

		Location ID	MW1-38		MW1-39		MW1-74		MW1-75		MW1-75 (DUP)	
		Sample Collection Date	24-Apr-2023		24-Apr-2023		24-Apr-2023		24-Apr-2023		24-Apr-2023	
Analyte	Project Action Level	Units										
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	NS	µg/L	0.0048	U	0.0048	U	0.0046	U	0.0047	U	0.0047	U
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	NS	µg/L	0.0021	J	0.0031	U	0.0029	U	0.0030	U	0.0030	U
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	NS	µg/L	0.0030	U	0.0031	U	0.0029	U	0.0030	U	0.0030	U
N-methyl perfluorooctanesulfonamidoacetic acid	NS	µg/L	0.0016	U	0.0016	U	0.0015	U	0.0016	U	0.0016	U
N-ethyl perfluorooctanesulfonamidoacetic acid	NS	µg/L	0.0013	U	0.0013	U	0.0012	U	0.0012	U	0.0013	U
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	0.0060[1]	µg/L	0.0051	U	0.0052	U	0.0049	U	0.0050	U	0.0050	U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NS	µg/L	0.0048	U	0.0048	U	0.0046	U	0.0047	U	0.0047	U
Perfluoro-3-methoxypropanoic acid (PFMPA)	NS	µg/L	0.0016	U	0.0016	U	0.0015	U	0.0016	U	0.0016	U
Perfluoro-4-methoxybutanoic acid (PFMBA)	NS	µg/L	0.0016	U	0.0016	U	0.0015	U	0.0016	U	0.0016	U
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	NS	µg/L	0.0016	U	0.0016	U	0.0015	U	0.0016	U	0.0016	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	NS	µg/L	0.0030	U	0.0030	U	0.0029	U	0.0029	U	0.0029	U
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	NS	µg/L	0.0030	U	0.0030	U	0.0029	U	0.0029	U	0.0030	U
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	NS	µg/L	0.0023	U	0.0023	U	0.0022	U	0.0022	U	0.0022	U

Notes:
Detected results exceeding the PAL are boldfaced and shaded grey.
Limits of detection for non-detected results exceeding the PAL are shaded grey.
[1] The PAL for this PFAS is the EPA Regional Screening Level for tapwater (target hazard quotient = 0.1), which is based on the protection of human health via drinking water only.
[2] The carcinogenic PAH TEQ is calculated in accordance with Publication No. 15-09-049 (Ecology 2015) and using a value of zero for non-detected results.
µg/L = microgram(s) per liter
EPA = U.S. Environmental Protection Agency
PAH = polyaromatic hydrocarbon
PAL = project action level
TEQ = Toxicity Equivalent Concentration
Data Qualifiers:
J = The reported result is an estimated value.
J+ = The reported result is an estimated value with a high bias.
U = The analyte is not detected at the associated limit of detection.

Table D-45. Summary of HVDPE System Operating Parameters

Parameter	Value	Details
HVDPE Pilot Test Start Date	5/4/2022	System set up and started on 5/3/2022; following initial optimization, system fully operational afternoon of 5/4/2022
HVDPE System Operation (No Air Sparge)	44 days	
HVDPE System Operation (Air Sparge)	35 days	Air sparging turned on: 6/17/2022 @ 1100
HVDPE System Operation (Total)	79 days	
HVDPE Pilot Test End Date	7/22/2022	
HVDPE Only (No Air Sparge)		
Air Flow Rate Range	30 to 40	As the extraction system was tuned, air flow rate steadily increased for the first month and then stabilized at 38 scfm from 6/3/22 to 6/29/22
Vacuum Range	24 to 27 in-Hg	Vacuum stabilized at 25 in-Hg from 5/24/22 to 7/22/22
Total Vapor Inlet Concentration Range (PID)	130.6 to 579.7 ppm	PID values (ppm) steadily decreased until air sparge start (see Figure 4-1 in Section 4)
Total Vapor Inlet Concentration Average (PID)	294.8 ppm	
Groundwater Discharge Flow Rate	10.9 gpm	Combination of stinger tubes and submersible pumps
HVDPE with Air Sparge		
Air Flow Rate Range	38 to 40 scfm	Air flow rate stabilized at 40 scfm from 6/29/22 to 7/22/22
Vacuum Range	25 in-Hg	Steady at 25 in-Hg for duration of air sparging
Total Vapor Inlet Concentration Range (PID)	148.9 to 736 ppm	PID values (ppm) spiked at start of air sparging, then steadily decreased until HVDPE system shutdown (see Figure 4-1 in Section 4)
Total Vapor Inlet Concentration Average (PID)	359.2 ppm	
Air Sparge Pressure Range	15 to 18 psi	Air sparge pressure began at 18 psi and was lowered to 15 psi on 6/18/22, which was maintained through end of pilot test

Table D-45. Summary of HVDPE System Operating Parameters

Parameter	Value	Details
Air Sparge Air Flow Range	0.5 to 9.5 scfm	Air flow range due to optimization period; air flow range 3 to 4 scfm from 6/19/22 through end of pilot test
Groundwater Discharge Flow Rate	9.8 gpm	Combination of stinger tubes and submersible pumps
Pilot Test Totals		
Average Groundwater Discharge Flow Rate	10.4 gpm	Combination of stinger tubes and submersible pumps
Total Groundwater Discharge	1,173,180 gallons	Combination of stinger tubes and submersible pumps
Estimated Carbon Usage	20,000 pounds	See Section 4.7.5

Notes:
See Appendix F for HVDPE system operation raw data

Table D-46. Summary of Observation Point Data

Well ID	Static Water Level at Start of HVDPE Test (ft bgs)	Water Level at System Shutdown (ft bgs)	New Static Water Level After Recovery (ft bgs)	Maximum Drawdown [a, b] (ft)
Data Loggers [a]				
MW1-04	6.45	6.29	5.34	0.95
MW1-20	3.59	6.28	4.36	1.92
MW1-49	6.22	NM [b]	NM [b]	0.99
MW1-50	8.25	NM [b]	NM [b]	1.16
MW1-53	3.88	NM [b]	NM [b]	1.66
MW1-55	5.65	8.36	6.48	1.88
MW1-68	2.94	4.70	4.06	0.64
P1-6	7.23	9.04	7.93	1.11
P1-7	6.68	8.58	7.24	1.34
P1-10	4.92	7.44	4.47	2.97
Manual Measurements Only				
IW1-S	4.21	NM	NM	1.6 [c]
MW1-61	5.17	NM	NM	0.54 [c]
MW1-56-1	6.75	NM	NM	1.95 [c, d]
MW1-56-2	6.64	NM	NM	1.81 [c, d]
MW1-57-1	7.68	NM	NM	2.02 [c, d]
MW1-57-2	7.03	NM	NM	3.51 [c, d]
MW1-58-0	6.63	NM	NM	1.57 [c, d]
MW1-58-1	7.64	NM	NM	1.93 [c, d]
MW1-58-2	7.65	NM	NM	1.65 [c, d]
S-4B [e]	1.92	NM	NM	0.91 [c]
S-9 [e]	2.55	NM	NM	2.29 [c]
S-10 [e]	2.76	NM	NM	0.67 [c]

Notes:
[a] Maximum drawdown defined as difference of final DTW reading prior to HVDPE system shutoff and DTW following 6 days of recovery.
[b] Data logger started data collection on 7/19/2022 and no manual groundwater measurement was collected at this time. Therefore, maximum drawdown was able to be calculated using relative difference of data logger levels from system shutdown and following 6 days of recovery.
[c] Maximum drawdown calculated based on static water level at beginning of test and final DTW measurements collected prior to air sparge start on 6/17/2022 (not at system shutdown).
[d] Static water level collected after start of test, on 5/65/2022.
[e] Surface water gauging station
NM - not measured

Table D-47. Soil Sampling Results from Sonic Drilling

Location Name			SP-B181						SP-B182							
Sample Name			SP-B181-S-7.0-220420		SP-B181-S-12.0-220420		SP-B181-S-18.0-220420		SP-B182-S-7.5-220420		SP-B182-S-8.0-220420		SP-B182-S-11.0-220420		SP-B182-S-16.0-220420	
Sample type			Normal		Normal		Normal		Parent		Duplicate		Normal		Normal	
Analyte	**Units**	**PAL (mg/kg)**	**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
Vinyl chloride	mg/kg	0.0000062	**0.488**		**0.167**		0.00466	UJ	**0.217**		**0.430**		**0.341**		**0.127**	J
Chloroethane	mg/kg	0.0026	0.00793	UJ	0.00781	UJ	0.00931	UJ	0.0729	U	0.0680	U	0.00848	UJ	0.00739	UJ
1,1-Dichloroethene	mg/kg	0.0025	0.00199	U	**0.00656**		0.00233	U	0.0182	U	0.0170	U	**0.0373**		**0.0158**	**J**
trans-1,2-Dichloroethene	mg/kg	0.032	0.0107		**0.0456**		0.00466	U	0.0365	U	0.0170	J	**0.167**		**0.0759**	**J**
1,1-Dichloroethane	mg/kg	0.0026	0.00199	U	0.00195	U	0.00233	U	0.0182	U	0.0170	U	0.00212	U	0.00185	UJ
cis-1,2-Dichloroethene	mg/kg	0.0052	**1.12**		**2.80**		**0.0219**		**0.113**	**J**	**1.68**	**J**	**9.22**		**1.77**	
1,1,1-Trichloroethane	mg/kg	0.084	0.00317	U	0.00313	U	0.00372	U	0.0292	U	0.0271	U	0.00339	U	0.00296	UJ
1,2-Dichloroethane	mg/kg	0.0016	0.00317	U	0.00313	U	0.00372	U	0.0292	U	0.0271	U	0.00339	U	0.00296	UJ
Trichloroethene	mg/kg	0.00011	0.00239	U	**5.88**		**0.0474**		0.0218	U	0.0204	U	**3.95**		**0.160**	**J**
Tetrachloroethene	mg/kg	0.0013	0.00317	U	0.00313	U	0.00372	U	0.0292	U	0.0271	U	0.00339	U	0.00296	UJ

Notes:
Samples analyzed using EPA Method 8260D
J - Estimated: The analyte was positively identified; the quantitation is an estimation
mg/kg - milligrams per kilogram
PAL - Project Action Limit
U - Undetected at the Limit of Detection
Bolded values indicate that the reported concentration exceeds the PAL
Underlined values represent analytes not detected at or above the stated limit, which exceeds the PAL

Table D-48. Groundwater Sampling Results from New Extraction Wells

Location Name			MW1-76		MW1-77		FD	
Sample Name			MW1-76-220429		MW1-77-220429		FD-220429-01	
Sample type			Normal		Parent		Duplicate	
Analyte	**Units**	**PAL (µg/L)**	**Result**		**Result**		**Result**	
cVOCs								
Vinyl chloride	µg/L	0.02	**924**		**130**		**136**	
Chloroethane	µg/L	7.7	2	U	0.64	J	1.45	J
1,1-Dichloroethene	µg/L	7	**16**		6.07		6.51	
trans-1,2-Dichloroethene	µg/L	100	**147**		42.3		43.7	
1,1-Dichloroethane	µg/L	7.7	0.537	J	0.5	U	0.5	U
cis-1,2-Dichloroethene	µg/L	16	**8820**		**581**		**571**	
1,1,1-Trichloroethane	µg/L	200	0.5	U	0.5	U	0.5	U
1,2-Dichloroethane	µg/L	0.48	0.5	U	0.5	U	0.5	U
Trichloroethene	µg/L	0.3	**4280**		**42.5**		**47.4**	
Tetrachloroethene	µg/L	2.4	0.6	U	0.6	U	0.6	U
PFAS								
Perfluorohexanoic acid (PFHxA)	ng/L	NE	2.52	U	2.42	U	2.68	U
Perfluoroheptanoic acid (PFHpA)	ng/L	NE	2.52	U	2.42	U	2.68	U
Perfluorooctanoic acid (PFOA)	ng/L	70	7.44		9.67		10.4	
Perfluorononanoic acid (PFNA)	ng/L	NE	2.52	U	1.67	J	2.68	U
Perfluorodecanoic acid (PFDA)	ng/L	NE	2.52	U	2.42	U	2.68	U
Perfluoroundecanoic acid (PFUnA)	ng/L	NE	2.52	U	2.42	U	2.68	U
Perfluorododecanoic acid (PFDoA)	ng/L	NE	2.52	U	2.42	U	2.68	U
Perfluorotridecanoic acid (PFTrDA)	ng/L	NE	2.52	UJ	2.42	UJ	2.68	UJ
Perfluorotetradecanoic acid (PFTeDA)	ng/L	NE	2.52	UJ	2.42	UJ	2.68	UJ
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	NE	2.52	U	2.42	U	2.68	U
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	NE	2.52	U	2.42	U	2.68	U
Perfluorobutanesulfonic acid (PFBS)	ng/L	6.0	2.52	U	2.42	U	2.68	U
Perfluorohexanesulfonic acid (PFHxS)	ng/L	NE	15.5		5.02	J	5.61	J
Perfluorooctanesulfonic acid (PFOS)	ng/L	70	37.5		9.95		9.38	

Table D-48. Groundwater Sampling Results from New Extraction Wells (continued)

			Location Name	MW1-76		MW1-77		FD	
			Sample Name	MW1-76-220429		MW1-77-220429		FD-220429-01	
			Sample type	Normal		Parent		Duplicate	
Analyte	**Units**	**PAL (µg/L)**		**Result**		**Result**		**Result**	
PFOA + PFOS	ng/L	70		44.94		19.62		19.78	

Notes:
Samples analyzed using EPA Method 8260D
J - Estimated: The analyte was positively identified; the quantitation is an estimation
PAL - Project Action Limit

U - Undetected at the Limit of Detection

ng/L - nanograms per liter
µg/L - micrograms per liter
Bolded values indicate that the reported concentration exceeds the PAL
Underlined values represent analytes not detected at or above the stated limit, which exceeds the PAL

Table D-49. Results of HVDPE System Laboratory Analytical Samples

Sample ID	Date Collected	Trichloroethene	cis-1,2-Dichloroethene	Vinyl Chloride
Water (µg/L)				
IN-01-220504	5/4/2022	69,000	37,000	1,100
IN-02-220511	5/11/2022	25,000	9,800	240
IN-03-220518	5/18/2022	25,000	7,500	160
IN-04-220525	5/25/2022	16,000	5,100	260 H
IN-05-220601	6/1/2022	24,000	5,900	160
IN-06-220608	6/8/2022	27,000	6,900	310
IN-07-220615	6/15/2022	31,000	5,900	300
IN-08-220621	6/21/2022	30,000	6,300	200
IN-09-220628	6/28/2022	22,000	4,400	130
IN-10-220705	7/5/2022	19,000	3,800	140
IN-11-220712	7/12/2022	24,000	3,600	100
IN-12-220719	7/19/2022	23,000	3,600	130
MD1-01-220504	5/4/2022	9,300	12,000	790
MD1-02-220511	5/11/2022	15,000	12,000	380
MD1-03-220518	5/18/2022	17,000	19,000	410
MD1-04-220525	5/25/2022	20,000 H	7,200 H	250 H
MD1-05-220601	6/1/2022	23,000	6,700	200
MD1-06-220608	6/8/2022	20,000	6,100	230
MD1-07-220615	6/15/2022	24,000	5,100	230
MD1-08-220621	6/21/2022	25,000	6,100	180
MD1-09-220628	6/28/2022	20,000	4,600	110
MD1-10-220705	7/5/2022	20,000	4,200	140
MD1-11-220712	7/12/2022	23,000 J	3,700	84
MD1-12-220719	7/19/2022	22,000	3,700	90 J
MD2-01-220504	5/4/2022	1 U	2.3	7.2

Table D-49. Results of HVDPE System Laboratory Analytical Samples

Sample ID	Date Collected	Trichloroethene	cis-1,2-Dichloroethene	Vinyl Chloride
MD2-02-220511	5/11/2022	120	10,000	830
MD2-03-220518	5/18/2022	910	9,300	250
MD2-04-220525	5/25/2022	4,000	9,200	200
MD2-05-220601	6/1/2022	10,000	8,800	200
MD2-06-220608	6/8/2022	12,000	6,500	130
MD2-07-220615	6/15/2022	18,000	5,100 H	130 H
MD2-08-220621	6/21/2022	20,000	5,800	170
MD2-09-220628	6/28/2022	15,000	4,800	91
MD2-10-220705	7/5/2022	20,000	5,400	110
MD2-11-220712	7/12/2022	22,000	3,900	83 J
MD2-12-220719	7/19/2022	20,000	3,600	100
EF-01-220504	5/4/2022	1 U	1 U	0.5 U
EF-02-220511	5/11/2022	1 U	1 U	0.5 U
EF-03-220518	5/18/2022	1 U	1 U	0.5 U
EF-04-220525	5/25/2022	1 H	1 U	0.5 U
EF-05-220601	6/1/2022	1 U	1 U	0.5 U
EF-06-220608	6/8/2022	1 U	1 U	0.5 U
EF-07-220615	6/15/2022	1 U	1 U	0.5 U
EF-08-220621	6/21/2022	1 U	1 U	0.5 U
EF-09-220628	6/28/2022	1 U	1 U	0.5 U
EF-10-220705	7/5/2022	1 U	1 U	0.5 U
EF-11-220712	7/12/2022	1 U	1 U	0.5 U
Vapor (µg/m^3)				
VR-TI-01-220504	5/4/2022	880,000 H	970,000 H	49,000
VR-TI-02-220505	5/5/2022	1,300,000	640,000	40,000
VR-TI-03-220506	5/6/2022	1,300,000	720,000	47,000

Table D-49. Results of HVDPE System Laboratory Analytical Samples

Sample ID	Date Collected	Trichloroethene	cis-1,2-Dichloroethene	Vinyl Chloride
VR-TI-04-220507	5/7/2022	450,000	290,000	29,000
VR-TI-05-220508	5/8/2022	1,200,000	500,000	28,000
VR-TI-06-220509	5/9/2022	3,200,000	1,200,000	66,000
VR-TI-07-220510	5/10/2022	1,800,000	670,000	46,000
VR-TI-08-220512	5/12/2022	750,000	350,000	50,000
VR-TI-09-220515	5/15/2022	1,700,000	570,000	48,000
VR-TI-11-220518	5/18/2022	1,600,000	510,000	47,000
VR-TI-12-220521	5/21/2022	1,900,000 H H3	510,000 H H3	30,000 H H3
VR-TI-13-220523	5/23/2022	600,000 H H3	160,000 H H3	16,000 H H3
VR-TI-14-220525	5/25/2022	850,000 H	210,000 H	18,000 H
VR-TI-15-220528	5/28/2022	470,000 H H3	270,000 H H3	27,000 H H3
VR-TI-16-220601	6/1/2022	350,000 H	250,000 H	29,000 H
VR-TI-17-220604	6/4/2022	450,000 H H3	130,000 H H3	15,000 H H3
VR-TI-18-220608	6/8/2022	140,000 H	240,000 H	27,000 H
VR-TI-19-220611	6/11/2022	530,000 H H3	160,000 H H3	26,000 H H3
VR-TI-20-220615	6/15/2022	410,000 H	180,000 H	20,000 H
VR-TI-21-220618	6/18/2022	1,000,000	280,000	65,000
VR-TI-22-220618	6/18/2022	2,200,000	650,000	270,000
VR-TI-23-220619	6/19/2022	1,500,000	330,000	95,000 H H3
VR-TI-24-220621	6/21/2022	2,300,000 H	530,000	110,000 H
VR-TI-25-220625	6/25/2022	1,600,000 H H3	440,000 H H3	85,000 H H3
VR-TI-26-220628	6/28/2022	1,800,000 H	300,000 H	42,000 H
VR-TI-27-220702	7/2/2022	1,700,000 H H3	180,000 H H3	34,000 H H3
VR-TI-28-220705	7/5/2022	1,600,000 H	170,000 H	30,000 H
VR-TI-29-220709	7/9/2022	800,000 H H3	120,000 H H3	25,000 H H3
VR-TI-30-220712	7/12/2022	1,200,000 H	140,000 H	25,000 H

Table D-49. Results of HVDPE System Laboratory Analytical Samples

Sample ID	Date Collected	Trichloroethene	cis-1,2-Dichloroethene	Vinyl Chloride
VR-TI-31-220716	7/16/2022	24,000 H H3	2,800 H H3	340 H H3
VR-TI-32-220719	7/19/2022	47,000 H	13,000 H	4,600 H
VR-TI-33-220722	7/22/2022	1,600,000 H H3	500,000 H H3	200,000 H H3
VR-MD-01-220504	5/4/2022	17 U	12 U	8 U
VR-MD-02-220505	5/5/2022	2..7 U	2 U	240
VR-MD-03-220506	5/6/2022	17	16	240
VR-MD-04-220507	5/7/2022	3.7	2.7	360
VR-MD-05-220508	5/8/2022	33	15	980
VR-MD-06-220509	5/9/2022	10	8.6	1,000
VR-MD-07-220510	5/10/2022	17 U	12 U	930
VR-MD-08-220512	5/12/2022	120	52	1,300
VR-MD-09-220518	5/18/2022	17 U	100	1,400
VR-MD-10-220525	5/25/2022	9,300 H	75,000	4,100
VR-MD-11-220601	6/1/2022	180,000 H	300,000 H	19,000
VR-MD-12-220608	6/8/2022	38,000 H	22,000 H	790
VR-MD-13-220615	6/15/2022	82,000 H	39,000 H	2,700
VR-MD-14-220621	6/21/2022	240,000 H	87,000 H	14,000
VR-MD-15-220628	6/28/2022	78,000 H	19,000 H	1,600 U H

Table D-49. Results of HVDPE System Laboratory Analytical Samples

Sample ID	Date Collected	Trichloroethene	cis-1,2-Dichloroethene	Vinyl Chloride
VR-MD-16-220705	7/5/2022	90,000 H	16,000 H	1,500
VR-MD-17-220712	7/12/2022	80,000 H	11,000 H	830
VR-MD-18-220719	7/19/2022	77,000 H	9,200 H	960
VR-EF-01-220504	5/4/2022	17 U	12 U	8 U
VR-EF-02-220505	5/5/2022	2.7 U	2 U	1.3 U
VR-EF-03-220506	5/6/2022	220	180	34
VR-EF-04-220507	5/7/2022	3.8	2.3	5.2
VR-EF-05-220508	5/8/2022	8.6	3.1	5.1
VR-EF-06-220509	5/9/2022	2.7	2 U	2.2
VR-EF-07-220510	5/10/2022	10	4.1	13
VR-EF-08-220512	5/12/2022	3.7	2 U	2.2
VR-EF-09-220518	5/18/2022	6.7 U	5 U	3.2 U
VR-EF-10-220525	5/25/2022	110 H	90	140 H
VR-EF-11-220601	6/1/2022	2.7 U H	2 U	16,000 H
VR-EF-12-220608	6/8/2022	48 H	16	1,400 H
VR-EF-13-220615	6/15/2022	290 H	120 H	420 H
VR-EF-14-220621	6/21/2022	25 H	12 H	980 H
VR-EF-15-220628	6/28/2022	86 H	19 H	1,300 H
VR-EF-16-220705	7/5/2022	130 H	56 H	1,400 H
VR-EF-17-220712	7/12/2022	260 H	1,300 H	1,500 H
VR-EF-18-220719	7/19/2022	120 H	3,700 H	550 H
VR-MW1-66-220503	5/3/2022	550,000 H	1,600,000 H	370,000 H
VR-MW1-66-220503	5/3/2022	460,000 H	1,400,000 H	360,000 H

Table D-49. Results of HVDPE System Laboratory Analytical Samples

Sample ID	Date Collected	Trichloroethene	cis-1,2-Dichloroethene	Vinyl Chloride
VR-MW1-66-220504	5/4/2022	2,100,000 H	2,000,000 H	280,000 H
VR-MW1-66-220505	5/5/2022	1,800,000	1,600,000	200,000
VR-MW1-66-220506	5/6/2022	1,800,000	1,200,000	210,000
VR-MW1-66-220507	5/7/2022	1,800,000	1,300,000	240,000
VR-MW1-66-220508	5/8/2022	2,400,000	790,000	160,000
VR-MW1-66-220509	5/9/2022	4,700,000	2,000,000	250,000
VR-MW1-66-220510	5/10/2022	620,000	270,000	84,000
VR-MW1-66-220512	5/12/2022	2,700,000	1,200,000	170,000
VR-MW1-66-220518	5/18/2022	2,100,000	790,000	180,000
VR-MW1-66-220525	5/25/2022	340,000 H	180,000 H	76,000 H
VR-MW1-66-220601	6/1/2022	840,000 H	450,000 H	160,000 H
VR-MW1-66-220608	6/8/2022	140,000 H	310,000 H	140,000 H
VR-MW1-66-220615	6/15/2022	1,200,000 H	390,000 H	180,000 H
VR-MW1-66-220617	6/17/2022	650,000	160,000 H H3	42,000 H H3
VR-MW1-66-220617	6/17/2022	1,100,000	230,000 H H3	53,000 H H3
VR-MW1-66-220617	6/17/2022	1,200,000	230,000 H H3	51,000 H H3
VR-MW1-66-220618	6/18/2022	1,200,000	470,000	180,000

Table D-49. Results of HVDPE System Laboratory Analytical Samples

Sample ID	Date Collected	Trichloroethene	cis-1,2-Dichloroethene	Vinyl Chloride
VR-MW1-66-220619	6/19/2022	2,000,000	670,000	410,000
VR-MW1-66-220621	6/21/2022	2,200,000 H	840,000 H	150,000 H
VR-MW1-66-220628	6/28/2022	1,200,000 H	340,000 H	290,000 H
VR-MW1-66-220705	7/5/2022	2,100,000 H	540,000 H	230,000 H
VR-MW1-66-220712	7/12/2022	2,600,000 H	530,000 H	200,000 H
VR-MW1-66-220719	7/19/2022	2,000,000 H	590,000 H	250,000 H
VR-MW1-76-220504	5/4/2022	650,000 H	320,000 H	4,500
VR-MW1-76-220505	5/5/2022	680,000	320,000	5,400
VR-MW1-76-220506	5/6/2022	480,000 H H3	210,000	7,900
VR-MW1-76-220507	5/7/2022	460,000	430,000	35,000
VR-MW1-76-220508	5/8/2022	800,000	200,000	11,000
VR-MW1-76-220509	5/9/2022	750,000	110,000	20,000
VR-MW1-76-220510	5/10/2022	1,400,000	310,000	13,000
VR-MW1-76-220512	5/12/2022	850,000	340,000	13,000
VR-MW1-76-220518	5/18/2022	940,000	200,000	7,500
VR-MW1-76-220525	5/25/2022	280,000	30,000 H	400 H
VR-MW1-76-220601	6/1/2022	510,000 H	81,000 H	3,700 H

Table D-49. Results of HVDPE System Laboratory Analytical Samples

Sample ID	Date Collected	Trichloroethene	cis-1,2-Dichloroethene	Vinyl Chloride
VR-MW1-76-220608	6/8/2022	510,000 H	62,000 H	3,500 H
VR-MW1-76-220615	6/15/2022	530,000 H	56,000 H	2,700
VR-MW1-76-220619	6/19/2022	1,200,000	200,000 H H3	4,200 H H3
VR-MW1-76-220621	6/21/2022	1,700,000	160,000 H	3,500 H
VR-MW1-76-220628	6/28/2022	1,100,000 H	50,000 H	1,600 U H
VR-MW1-76-220705	7/5/2022	580,000 H	21,000 H	1,600 U H
VR-MW1-76-220712	7/12/2022	1,000,000 H	23,000 H	3,200 U H
VR-MW1-76-220719	7/19/2022	250,000 H	9,300 H	260
VR-MW1-77-220504	5/4/2022	610,000 H	320,000	16,000
VR-MW1-77-220505	5/5/2022	730,000	340,000	40,000
VR-MW1-77-220506	5/6/2022	560,000	180,000	28,000
VR-MW1-77-220507	5/7/2022	480,000	400,000	51,000
VR-MW1-77-220508	5/8/2022	780,000	220,000	35,000
VR-MW1-77-220509	5/9/2022	1,200,000	210,000	52,000
VR-MW1-77-220510	5/10/2022	2,000,000	490,000	67,000
VR-MW1-77-220512	5/12/2022	1,600,000	420,000	85,000
VR-MW1-77-220518	5/18/2022	1,000,000	260,000	85,000

Table D-49. Results of HVDPE System Laboratory Analytical Samples

Sample ID	Date Collected	Trichloroethene	cis-1,2-Dichloroethene	Vinyl Chloride
VR-MW1-77-220525	5/25/2022	340,000 H	87,000 H	5,4000 H
VR-MW1-77-220601	6/1/2022	490,000 H	130,000 H	91,000 H
VR-MW1-77-220608	6/8/2022	490,000 H	110,000 H	78,000 H
VR-MW1-77-220615	6/15/2022	520,000 H	100,000 H	72,000 H
VR-MW1-77-220619	6/19/2022	1,200,000	250,000 H H3	160,000 H H3
VR-MW1-77-220621	6/21/2022	1,800,000 H	360,000 H	220,000 H
VR-MW1-77-220628	6/28/2022	660,000 H	150,000 H	99,000 H
VR-MW1-77-220705	7/5/2022	550,000 H	120,000 H	93,000 H
VR-MW1-77-220712	7/12/2022	1,100,000 H	130,000 H	87,000 H
VR-MW1-77-220719	7/19/2022	240,000 H	53,000 H	60,000 H

Notes:
Samples in this table were analyzed by CalScience and were not subject to third-party data validation in favor of statistically comparing these results to the split sample results analyzed by a DoD and Washington State accredited lab, the results of which were subject to validation.
H - Sample was prepped or analyzed beyond the specified holding time
H 3 - Sample was received and analyzed past holding time
J - Result is less than the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value
U - Undetected at the Limit of Detection
µg/L - micrograms per liter
µg/m^3 - micrograms per cubic meter

Table D-50. Post-Pilot Test Groundwater Sampling Field Parameters

Location	Date	Depth to Groundwater (ft-BTOC)	pH (s.u.)	Specific conductance (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (ºC)	Salinity (ppt)	ORP (mV)
MW1-04	22-Aug-2022	7.04	7.03	0.230	3.17	0.48	15.3	0.11	107
MW1-04	25-Oct-2022	6.88	7.35	0.313	1.03	0.36	13.4	0.15	41.7
MW1-04	23-Jan-2023	6.53	8.02	0.240	2.99	2.09	10.4	0.11	110.1
MW1-20	24-Aug-2022	4.56	6.44	0.491	2.01	0.57	19.5	0.24	76.2
MW1-20	26-Oct-2022	4.72	6.78	0.528	1.50	0.88	17.6	0.26	77.3
MW1-20	23-Jan-2023	4.33	6.67	0.504	2.11	1.25	11.5	0.25	2.1
MW1-49	24-Aug-2022	6.31	7.36	0.249	4.37	0.58	13.6	0.12	-93.6
MW1-49	26-Oct-2022	6.13	7.23	0.300	0.02	0.62	12.8	0.14	-5.9
MW1-49	23-Jan-2023	5.88	7.46	0.256	4.70	0.95	10.5	0.12	-63.7
MW1-50	22-Aug-2022	8.58	7.05	0.225	2.39	0.73	14.2	0.11	110.3
MW1-50	25-Oct-2022	8.37	6.98	0.518	0.02	0.79	13.1	0.25	67.9
MW1-50	23-Jan-2023	7.90	7.58	0.241	1.82	0.80	11.1	0.12	66.5
MW1-52	22-Aug-2022	9.27	8.60	0.290	3.29	0.48	13.4	0.14	44.6
MW1-52	26-Oct-2022	8.72	8.33	0.364	0.02	0.40	12.6	0.18	0.6
MW1-52	23-Jan-2023	7.90	7.38	0.322	2.50	0.42	10.6	0.15	-150.5
MW1-53	22-Aug-2022	4.96	7.82	0.335	7.02	0.47	13.5	0.16	-124.3
MW1-53	25-Oct-2022	5.02	8.03	0.369	3.27	0.71	13.4	0.18	-77.6
MW1-53	23-Jan-2023	3.41	7.95	0.327	4.75	0.44	10.1	0.16	-95.3
MW1-54	22-Aug-2022	6.23	6.42	0.186	3.57	1.92	15.5	0.09	98.2
MW1-54	26-Oct-2022	6.11	6.53	0.240	0.02	1.55	11.8	0.11	-22.6
MW1-54	25-Jan-2023	5.22	6.84	0.158	1.06	2.32	10.5	0.07	38.5
MW1-55	23-Aug-2022	6.47	6.95	0.196	1.99	0.90	13.3	0.09	103.6
MW1-55	26-Oct-2022	6.32	6.70	0.269	0.02	0.61	11.9	0.13	-17.9
MW1-55	23-Jan-2023	5.31	7.05	0.203	2.91	1.05	10.6	0.1	126
MW1-56-1	23-Aug-2022	6.64	6.35	0.341	32.88	0.38	14.9	0.16	-23.3
MW1-56-1	26-Oct-2022	6.56	6.57	0.542	8.47	0.84	13.5	0.26	-17
MW1-56-1	25-Jan-2023	5.59	6.68	0.356	8.10	0.83	10.6	0.17	6.1
MW1-56-2	23-Aug-2022	6.60	6.42	0.368	3.89	0.45	13.9	0.17	10.1
MW1-56-2	26-Oct-2022	6.56	6.62	0.511	3.73	0.70	12.5	0.25	-12.1
MW1-56-2	25-Jan-2023	5.61	6.73	0.300	2.21	0.81	11.8	0.14	3.6
MW1-57-0	22-Aug-2022	6.48	6.57	0.388	6.03	0.39	15.9	0.18	-41.7
MW1-57-0	25-Oct-2022	6.51	6.91	0.371	1.89	0.72	13.3	0.18	-69.3
MW1-57-0	25-Jan-2023	5.32	6.81	0.313	4.38	0.49	11.8	0.15	-70.4
MW1-57-1	23-Aug-2022	6.50	6.40	0.434	8.14	0.36	16.0	0.21	-14.3
MW1-57-1	25-Oct-2022	6.50	6.35	0.590	9.37	0.63	14.9	0.29	-43.4
MW1-57-1	25-Jan-2023	5.25	6.22	0.471	8.92	0.43	11.8	0.22	-54.8
MW1-57-2*	25-Oct-2022	6.50	6.73	0.492	60.39	8.19	13.5	0.24	-52.3
MW1-57-2	25-Jan-2023	5.32	6.31	0.861	33.38	5.75	10.0	0.43	-36.6
MW1-58-1	22-Aug-2022	7.73	6.52	0.470	7.41	5.49	18.5	0.23	8.8
MW1-58-1	25-Oct-2022	7.82	7.08	0.550	8.51	9.61	13.7	0.27	-62.7
MW1-58-1	25-Jan-2023	6.29	6.40	0.701	9.88	4.98	10.0	0.34	-38.4
MW1-58-2	22-Aug-2022	7.79	6.86	0.332	30.11	0.43	15.4	0.16	-93.6

Table D-50. Post-Pilot Test Groundwater Sampling Field Parameters

Location	Date	Depth to Groundwater (ft-BTOC)	pH (s.u.)	Specific conductance (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (ºC)	Salinity (ppt)	ORP (mV)
MW1-58-2	25-Oct-2022	7.81	6.99	0.383	20.83	0.71	13.9	0.19	-96.7
MW1-58-2	25-Jan-2023	6.38	6.83	0.321	6.83	0.50	12.2	0.16	-84.8
MW1-61	22-Aug-2022	5.82	7.50	0.464	5.44	0.47	16.9	0.22	-85.4
MW1-61	26-Oct-2022	6.03	7.54	0.483	9.18	0.62	16.6	0.23	-54.5
MW1-61	23-Jan-2023	4.58	7.14	0.382	5.84	0.47	12.7	0.18	-50.8
MW1-66	23-Aug-2022	5.77	6.51	0.368	14.13	0.37	15.9	0.18	-100.6
MW1-66	25-Oct-2022	5.78	6.62	0.446	18.12	0.61	15.1	0.22	-118.2
MW1-66	25-Jan-2023	4.63	6.65	0.339	2.40	0.83	11.1	0.16	-19.8
MW1-68	23-Aug-2022	4.22	7.42	0.263	5.02	0.47	15.7	0.13	-132.3
MW1-68	26-Oct-2022	4.47	7.50	0.407	3.22	0.72	13.5	0.20	-107.3
MW1-68	25-Jan-2023	2.63	7.58	0.231	9.17	0.77	11.6	0.11	-118.4
MW1-76	22-Aug-2022	8.61	7.68	0.231	9.02	0.43	13.8	0.11	-108.5
MW1-76	25-Oct-2022	8.45	7.61	0.303	0.79	0.28	12.6	0.15	17.6
MW1-76	23-Jan-2023	8.01	7.53	0.246	5.20	0.87	11.0	0.12	-55.7
P1-6	22-Aug-2022	7.92	8.32	0.276	2.35	0.49	12.9	0.13	-59.0
P1-6	25-Oct-2022	7.80	7.56	0.328	0.03	0.52	12.7	0.16	79.4
P1-6	25-Jan-2023	7.08	8.40	0.215	2.46	0.58	10.5	0.10	86.4
P1-7	22-Aug-2022	7.22	6.92	0.217	7.57	0.57	13.9	0.10	-42.4
P1-7	25-Oct-2022	7.02	6.97	0.292	0.02	0.37	13.1	0.14	35.2
P1-7	23-Jan-2023	6.52	6.89	0.279	1.67	0.87	11.1	0.13	12.0
P1-10	22-Aug-2022	6.02	7.14	0.298	2.23	0.45	15.0	0.14	-54.6
P1-10	26-Oct-2022	5.95	7.14	0.441	1.67	0.71	14.0	0.21	-27.4
P1-10	25-Jan-2023	4.89	7.20	0.290	1.72	0.80	11.8	0.14	-34.6

Notes:
* = MW1-57-2 was pumped dry with insufficient volume recharge to collect water quality parameters.
°C = degrees Celsius
BTOC = below top of casing
ft = foot (feet)
mg/L = milligram(s) per liter
mS/cm = milliSiemens(s) per centimeter
mV = millivolt(s)
NTU = nephelometric turbidity unit
ORP = oxidation/reduction potential
pH = potentiometric hydrogen ion concentration
ppt = part(s) per thousand
s.u. = standard unit(s)

Table D-51. Post-Pilot Test Porewater Sampling Field Parameters

Location	Date	Sample Depth (ft bgs)	pH (s.u.)	Specific conductance (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Salinity (ppt)	ORP (mV)
PW1-10	23-Aug-2022	1.0	6.37	0.266	58.79	2.84	18.9	0.13	-37
PW1-10	24-Oct-2022	1.0	3.35	2.237	146.4	9.75	14.5	1.17	366.1
PW1-10	24-Jan-2023	1.0	6.60	0.089	693.7	3.93	7.2	0.04	135.3
PW1-11	23-Aug-2022	0.67	5.45	0.410	200.1	2.76	24.2	0.20	85.7
PW1-11	24-Oct-2022	1.0	6.15	0.315	67.88	8.57	13.4	0.15	77
PW1-11	24-Jan-2023	1.0	6.73	0.075	419.0	4.46	7.1	0.03	138.5
PW1-15	23-Aug-2022	0.67	NA	NA	NA	NA	NA	NA	NA
PW1-15	24-Oct-2022	1.0	6.45	0.491	62.94	4.07	12.7	0.24	65
PW1-15	24-Jan-2023	1.0	6.70	0.184	482.5	5.34	7.5	0.09	163.1
PW1-16[1]	23-Aug-2022	0.67	NA	NA	NA	NA	NA	NA	NA
PW1-16[1]	24-Oct-2022	1.0	7.10	0.453	133.8	9.07	13.4	0.22	36.1
PW1-2	23-Aug-2022	1.0	6.05	0.329	489.8	2.35	20.6	0.16	-42.6
PW1-2	24-Oct-2022	1.0	6.60	0.357	328.2	7.14	14.6	0.17	103.1
PW1-2	24-Jan-2023	1.0	6.62	0.071	52.15	6.75	7.6	0.03	114.6
PW1-29[1]	23-Aug-2022	0.67	NA	NA	NA	NA	NA	NA	NA
PW1-29[1]	24-Oct-2022	1.0	7.06	0.267	205.7	9.42	13.4	0.13	106
S-4	23-Aug-2022	1.0	6.43	0.229	17.42	3.15	17.8	0.11	3.15
S-4	24-Oct-2022	1.0	6.87	0.213	29.43	3.48	12.5	0.10	53.6
S-4	24-Jan-2023	1.0	6.95	0.210	112.1	5.94	8.4	0.10	122.5
S-4B	23-Aug-2022	1.0	NA	NA	NA	NA	NA	NA	NA
S-4B	24-Oct-2022	1.0	6.94	0.233	111.4	7.32	12.7	0.11	38.5
S-4B	24-Jan-2023	1.0	6.83	0.195	286.2	6.54	8.3	0.09	173.3
S-5	23-Aug-2022	1.0	7.17	0.247	28.78	5.16	19.7	0.12	-53.4
S-5	24-Oct-2022	1.0	7.10	0.267	12.12	7.12	12.4	0.13	24.5
S-5	24-Jan-2023	1.0	6.75	0.201	38.87	2.51	8.1	0.10	28.9

Notes:
1. During the 3-month and 6-month events, groundwater samples could not be collected at PW1-16 and PW1-29 due to the presence of product.

°C = degrees Celsius
BTOC = below top of casing
ft bgs = feet below ground surface
mg/L = milligram(s) per liter
mS/cm = milliSiemens(s) per centimeter
mV = millivolt(s)
NA = insufficient water for collection of field parameters
NTU = nephelometric turbidity unit
ORP = oxidation/reduction potential
pH = potentiometric hydrogen ion concentration
ppt = part(s) per thousand
s.u. = standard unit(s)

Table D-52. Post-Pilot Test Surface Water Sampling Field Parameters

Location	Date	Depth of Water at Sampling Location (ft)	pH (s.u.)	Specific conductance (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Salinity (ppt)	ORP (mV)
MA12	23-Aug-2022	0.33	7.80	0.411	5.87	6.93	21.7	0.2	57.9
MA12	24-Oct-2022	0.33	6.93	0.528	8.12	6.02	10.8	0.26	201.6
MA12	24-Jan-2023	0.66	6.65	0.135	5.84	7.75	6.2	0.06	249.5
SW1-07	23-Aug-2022	0.13	9.01	0.113	86.7	3.53	27.3	0.05	-21.3
SW1-07	24-Oct-2022	0.16	6.74	0.243	11.58	6.37	11.5	0.12	192.7
SW1-07	24-Jan-2023	0.38	6.58	0.092	5.73	5.75	6.7	0.04	107.5
SW1-08	23-Aug-2022	0.50	7.11	0.261	24.24	3.37	18.3	0.12	-41.2
SW1-08	24-Oct-2022	0.50	7.05	0.245	18.29	5.59	11.4	0.12	59.9
SW1-08	24-Jan-2023	0.25	6.85	0.200	116.84	4.71	7.2	0.10	62.2
SW1-09	23-Aug-2022	0.33	6.42	0.283	96.53	4.30	16.0	0.14	29.3
SW1-09	24-Oct-2022	0.16	6.86	0.254	121.86	3.40	11.8	0.12	-15.9
SW1-09	24-Jan-2023	0.16	6.85	0.133	73.47	7.45	6.6	0.06	194.6
SW1-10	23-Aug-2022	0.33	6.61	0.258	105.5	3.01	17.4	0.12	-80.4
SW1-10	24-Oct-2022	0.16	7.17	0.249	8.06	6.80	10.7	0.12	184.3
SW1-10	24-Jan-2023	0.83	6.91	0.144	81.95	6.92	6.8	0.07	168.7
SW1-11	23-Aug-2022	0.66	6.79	0.242	4.76	4.82	18.1	0.12	13.3
SW1-11	24-Oct-2022	0.66	7.11	0.256	3.83	5.44	10.7	0.12	179.9
SW1-11	24-Jan-2023	0.41	6.76	0.132	7.51	7.25	6.3	0.06	199

Notes:
°C = degrees Celsius
BTOC = below top of casing
ft = foot (feet)
mg/L = milligram(s) per liter
mS/cm = milliSiemens(s) per centimeter
mV = millivolt(s)
NTU = nephelometric turbidity unit
ORP = oxidation/reduction potential
pH = potentiometric hydrogen ion concentration
ppt = parts per thousand
s.u. = standard unit(s)

Table D-53. Pre- and Post-Pilot Test Groundwater Sampling Analytical Data

		Analyte	1,1-Dichloroethane		1,2-Dichloroethane		1,1-Dichloroethene		Chloroethane		*cis*-1,2-Dichloroethene		*trans*-1,2-Dichloroethene		Tetrachloroethene		1,1,1-Trichloroethane		Trichloroethene		Vinyl chloride	
		Unit	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		PAL	7.7		0.48		7.0		7.7		16		100		2.4		200		0.30		0.020	
Location	Sample ID	Sample Date	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
MW1-04	AREA-1-19-203	6/19/2019	0.20	U	0.20	U	1.3		--		**580**		7.3		0.50	U	0.20	U	**680**		**34**	
	PT1-MW1-04	8/22/2022	7.0	U	15	U	7.0	U	25	U	**140**		7.0	U	25	U	7.0	U	**520**		**6.6**	J
	PT1-MW1-04-A (Dup)	8/22/2022	7.0	U	15	U	7.0	U	25	U	**100**		7.0	U	25	U	7.0	U	**460**		**2.3**	J
	PT3-MW1-04	10/25/2022	5.0	U	8.0	U	5.0	U	8.0	U	**250**		8.0	U	8.0	U	8.0	U	**270**		**8.6**	J
	PT3-MW1-04-A (Dup)	10/25/2022	5.0	U	8.0	U	5.0	U	8.0	U	**240**		8.0	U	8.0	U	8.0	U	**260**		**8.2**	J
	PT6-MW1-04	1/23/2023	5.0	U	8.0	U	5.0	U	8.0	U	**320**		4.3	J	8.0	U	8.0	U	**290**		**5.2**	J
	PT6-MW1-04-A (Dup)	1/23/2023	5.0	U	8.0	U	5.0	U	8.0	U	**330**		8.0	U	8.0	U	8.0	U	**290**		**5.2**	J
MW1-20	PT1-MW1-20	8/24/2022	0.50	U	0.80	U	0.50	U	0.80	U	0.80	UJ	0.80	U	0.80	U	0.80	UJ	**0.31**	J-	0.50	U
	PT3-MW1-20	10/26/2022	0.070	U	0.15	U	0.070	U	0.25	U	0.15	U	0.070	U	0.25	U	0.070	U	0.15	U	0.015	U
	PT6-MW1-20	1/23/2023	0.070	U	0.15	U	0.070	U	0.25	U	0.15	U	0.070	U	0.25	U	0.070	U	0.15	U	0.090	U
MW1-49	MW1-49-191022	10/22/2019	0.30	U	0.30	U	**8.8**		1.8		**1,300**	J	19		0.30	U	0.30	U	**940**	J	**100**	J
	FD-191022-01 (Dup)	10/22/2019	0.30	U	0.30	U	**9.1**		0.59	J	**1,300**	J	21		0.30	U	0.30	U	**990**	J	**84**	J
	PT1-MW1-49	8/24/2022	0.70	J	0.8	U	6.6		1.9		**1,200**	J-	17		0.80	U	0.80	UJ	**760**	J-	**120**	J-
	PT3-MW1-49	10/26/2022	50	UJ	80	UJ	50	UJ	80	UJ	**810**	J-	80	UJ	80	UJ	80	UJ	**750**	J-	**61**	J-
	PT6-MW1-49	1/23/2023	50	U	80	U	50	U	80	U	**390**		80	U	80	U	80	U	**120**		**75**	J
MW1-50	MW1-50-191023	10/23/2019		R		R	0.59	J		R	**400**		4.3	J		R		R	**420**		**27**	J
	PT1-MW1-50	8/22/2022	7.0	U	15	U	7.0	U	25	U	**120**		7.0	U	25	U	7.0	U	**120**		**13**	
	PT3-MW1-50	10/25/2022	0.50	U	0.80	U	0.50	U	0.80	U	**100**		1.2		0.80	U	0.80	U	**98**		**6.6**	
	PT6-MW1-50	1/23/2023	0.50	U	0.80	U	2.1		0.80	U	**1,500**		12		0.80	U	0.80	U	**1,400**		**71**	
MW1-52	MW1-52-191021	10/21/2019	0.30	U	0.30	U	1.7		0.50	U	**510**	J	5.5		0.30	U	0.30	U	0.30	U	**120**	
	PT1-MW1-52	8/22/2022	0.45	J	0.80	U	0.70	J	0.37	J	**150**		0.50	J	0.80	U	0.80	U	**0.44**	J-	**59**	
	PT1-MW1-52-A (Dup)	8/22/2022	0.43	J	0.80	U	0.68	J	0.41	J	**140**	J-	0.54	J	0.80	U	0.80	U	**0.33**	J-	**58**	
	PT3-MW1-52	10/26/2022	0.50	U	0.80	U	0.57	J	0.80	U	**130**		0.80	U	0.80	U	0.80	U	**0.39**	J	**49**	J
	PT3-MW1-52-A (Dup)	10/26/2022	0.44	J-	0.80	UJ	0.91	J-	0.65	J-	**170**	J-	0.80	UJ	0.80	UJ	0.80	UJ	**0.40**	J-	**110**	J
	PT6-MW1-52	1/23/2023	0.60	J	0.80	U	0.72	J	**10**		**190**		0.71	J	0.80	U	0.80	U	**3.4**	J	**49**	
	PT6-MW1-52-A (Dup)	1/23/2023	0.59	J	0.80	U	0.85	J	**8.7**		**200**		1.1		0.80	U	0.80	U	**7.5**		**53**	
MW1-53	MW1-53-191023	10/23/2019	0.30	U	0.30	U	4.2		0.50	U	**760**	J	43		0.30	U	0.30	U	**130**	J	**220**	J
	PT1-MW1-53	8/22/2022	7.0	U	15	U	7.0	U	25	U	**340**		22		25	U	7.0	U	**51**		**250**	
	PT3-MW1-53	10/25/2022	0.50	U	0.80	U	2.5		0.80	U	**470**	J-	32		0.80	U	0.80	U	**60**		**170**	J-
	PT6-MW1-53	1/23/2023	5.0	U	8.0	U	5.0	U	8.0	U	**620**		40		8.0	U	8.0	U	**82**		**180**	
MW1-54	MW1-54-191021	10/21/2019	0.30	U	0.3	U	0.50	U	0.50	U	0.30	UJ	0.30	U	0.30	U	0.30	U	0.30	UJ	0.015	U
	PT1-MW1-54	8/22/2022	0.070	U	0.15	U	0.070	U	0.25	U	0.15	U	0.070	U	0.25	U	0.070	U	0.15	U	0.015	U
	PT3-MW1-54	10/26/2022	0.070	U	0.15	U	0.070	U	0.25	U	0.15	U	0.070	U	0.25	U	0.033	J	0.15	U	0.015	U
	PT6-MW1-54	1/25/2023	0.070	U	0.15	U	0.070	U	0.25	U	0.15	U	0.070	U	0.25	U	0.070	U	0.15	U	0.09	U
MW1-55	MW1-55-191024	10/24/2019	0.30	U	0.3	U	1.7		0.50	U	**130**	J	3.7		0.30	U	0.30	U	**3.1**		**24**	J
	PT1-MW1-55	8/23/2022	0.50	U	0.80	U	0.50	U	0.80	U	10		0.57	J	0.80	U	0.80	U	**1.5**	J-	**0.5**	J
	PT3-MW1-55	10/26/2022	0.070	U	0.15	U	0.39		0.25	U	**22**		1.1		0.25	U	0.035	J	**2.4**		**1.2**	
	PT6-MW1-55	1/23/2023	0.070	U	0.15	U	0.10	J	0.25	U	5.4		0.45		0.25	U	0.070	U	**0.84**		**0.26**	
MW1-56-1	MW1-56-12-191023	10/23/2019	0.30	U	0.30	U	**78**	J	0.50	U	**200,000**	J	**2,900**		**19**		0.30	U	**170,000**	J	**890**	J
	PT1-MW1-56-1	8/23/2022	0.50	UJ	0.80	UJ	**26**	J-	0.96	J-	**27,000**	J-	800	UJ	**36**	J-	0.80	UJ	**120,000**	J-	**250**	J-
	PT3-MW1-56-1	10/26/2022	500	U	800	U	500	U	800	U	**35,000**		800	U	800	U	800	U	**140,000**		**300**	J
	PT6-MW1-56-1	1/25/2023	500	U	800	U	500	U	800	U	**48,000**		800	U	800	U	800	U	**140,000**	J-	**410**	J
MW1-56-2	MW1-56-24-191023	10/23/2019	0.30	UJ	0.30	UJ	**43**	J	0.50	UJ	**71,000**	J	**1,200**		**110**	J	0.30	UJ	**590,000**	J	**72**	J

Table D-53. Pre- and Post-Pilot Test Groundwater Sampling Analytical Data

		Analyte	1,1-Dichloroethane		1,2-Dichloroethane		1,1-Dichloroethene		Chloroethane		*cis*-1,2-Dichloroethene		*trans*-1,2-Dichloroethene		Tetrachloroethene		1,1,1-Trichloroethane		Trichloroethene		Vinyl chloride	
		Unit	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		PAL	7.7		0.48		7.0		7.7		16		100		2.4		200		0.30		0.020	
Location	Sample ID	Sample Date	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
	PT1-MW1-56-2	8/23/2022	0.50	UJ	0.80	UJ	**23**	J-	0.84	J-	**41,000**	J-	800	UJ	**48**	J-	0.80	UJ	**75,000**	J-	500	UJ
	PT3-MW1-56-2	10/26/2022	500	U	800	U	500	U	800	U	**73,000**		800	U	800	U	800	U	**81,000**		**370**	J
	PT6-MW1-56-2	1/25/2023	500	U	800	U	500	U	800	U	**68,000**		800	U	800	U	800	U	**72,000**		**570**	J
MW1-57-0	MW1-57-32-191022	10/22/2019	0.30	U	0.30	U	3.6		0.50	U	**1,800**	J	46		1.6		0.30	U	**4600**	J	**230**	J
	PT1-MW1-57-0	8/22/2022	7.0	U	15	U	7.0	U	25	U	**750**		12	J	25	U	7.0	U	**630**		**170**	
	PT3-MW1-57-0	10/25/2022	5.0	U	8.0	U	13		8.0	U	**18,000**	J-	57		8.0	U	8.0	U	**22,000**	J-	**150**	
	PT6-MW1-57-0	1/25/2023	250	U	400	U	250	U	400	U	**860**		400	U	400	U	400	U	**2,400**		**200**	J
MW1-57-1	MW1-57-16-191022	10/22/2019	0.30	U	0.30	U	**74**	J	0.50	U	**130,000**	J	**3,000**	J	**55**	J	0.30	U	**230,000**	J	**200**	J
	PT1-MW1-57-1	8/23/2022	0.50	UJ	0.80	UJ	**18**	J	0.80	UJ	**63,000**	J-	800	UJ	**11**	J	0.80	UJ	**33,000**	J-	**19**	J
	PT3-MW1-57-1	10/25/2022	50	U	80	U	50	U	80	U	**120,000**	J-	**260**		80	U	80	U	**4,500**		**28**	J
	PT6-MW1-57-1	1/25/2023	500	U	800	U	500	U	800	U	**130,000**		**410**	J	800	U	800	U	**7,700**		**300**	J
MW1-57-2	MW1-57-10-191022	10/22/2019	150	U	150	U	250	U	250	U	**260,000**	J	**2,000**		150	U	150	U	**250,000**	J	**8,700**	
	PT1-MW1-57-2	8/23/2022	0.50	UJ	0.80	UJ	**7.2**	J-	0.80	UJ	**16,000**	J-	**110**	J-	**10**	J-	0.80	UJ	**100,000**	J-	**67**	J-
	PT3-MW1-57-2	10/25/2022	50	U	80	U	50	U	80	U	**60,000**	J-	57	J	80	U	80	U	**61,000**	J-	**30**	J
	PT6-MW1-57-2	1/25/2023	500	U	800	U	500	U	800	U	**110,000**	J-	800	U	800	U	800	U	**120,000**	J-	**3,300**	
MW1-58-0	MW1-58-39.5-191024	10/24/2019	0.30	UJ	0.30	UJ	0.50	UJ	0.50	UJ	2.1	J	0.15	J	0.30	UJ	0.30	UJ	0.30	UJ	**5.2**	J
MW1-58-1	MW1-58-9-191024	10/24/2019	30	U	30	U	50	U	50	U	**6,900**		**140**		30	U	30	U	**370**		**19,000**	J
	PT1-MW1-58-1	8/22/2022	70	U	150	U	70	U	250	U	**6,600**		58	J	250	U	70	U	**13,000**		**770**	
	PT3-MW1-58-1	10/25/2022	50	U	80	U	50	U	80	U	**85**	J-	80	U	80	U	80	U	**1,200**		**300**	
	PT6-MW1-58-1	1/25/2023	50	U	80	U	**160**		80	U	**39,000**	J-	**400**		80	U	80	U	**4,700**		**5,900**	J-
MW1-58-2	MW1-58-19-191024	10/24/2019	0.30	U	0.30	U	0.50	U	0.50	U	3.1		3.3		0.30	U	0.30	U	0.30	U	**9.1**	
	PT1-MW1-58-2	8/22/2022	7.0	U	15	U	7.0	U	25	U	**96**		3.7	J	25	U	7.0	U	**97**		**50**	
	PT3-MW1-58-2	10/25/2022	0.50	U	0.80	U	0.50	U	0.80	U	**46**	J-	1.7		0.80	U	0.80	U	**13**	J-	**25**	
	PT6-MW1-58-2	1/25/2023	0.50	U	0.80	U	0.50	U	0.80	U	13		1.8		0.80	U	0.80	U	**1.6**		**5.5**	
MW1-61	MW1-61-191028	10/28/2019	0.30	U	0.30	U	0.50	U	0.50	U	13		0.89	J	0.30	U	0.30	U	0.30	U	**61**	
	PT1-MW1-61	8/22/2022	7.0	U	15	U	7.0	U	25	U	**17**	J	7.0	U	25	U	7.0	U	15	U	**150**	
	PT3-MW1-61	10/26/2022	0.50	UJ	0.80	UJ	0.50	UJ	0.80	UJ	**20**	J-	1.1	J-	0.80	UJ	0.80	UJ	0.26	J-	**84**	J-
	PT6-MW1-61	1/23/2023	5.0	U	8.0	U	5.0	U	8.0	U	11		8.0	U	8.0	U	8.0	U	**3.3**	J	**26**	
MW1-66	MW1-66-191024	10/24/2019	0.30	U	0.30	U	**73**	J	0.50	U	**96,000**	J	**1,500**	J	**42**	J	0.30	U	**280,000**	J	**2,200**	J
	PT1-MW1-66	8/23/2022	5.0	U	8.0	U	**27**		8.0	U	**63,000**	J-	**300**		**12**		8.0	U	**35,000**	J-	**120**	
	PT3-MW1-66	10/25/2022	50	U	80	U	50	U	80	U	**74,000**	J-	**120**		80	U	80	U	**290**		**280**	
	PT6-MW1-66	1/25/2023	500	U	800	U	500	U	800	U	**45,000**		800	U	800	U	800	U	**73,000**	J-	**2,400**	J-
MW1-68	MW1-68-191028	10/28/2019	0.30	U	0.30	U	0.50	U	0.50	U	3.4		0.30	U	0.30	U	0.30	U	**35**		**0.062**	
	PT1-MW1-68	8/23/2022	0.50	U	0.80	U	0.50	U	0.80	U	0.80	UJ	0.80	U	0.80	U	0.80	U	0.50	UJ	0.50	U
	PT3-MW1-68	10/26/2022	0.070	U	0.15	U	0.070	U	0.25	U	0.15	U	0.070	U	0.25	U	0.070	U	0.11	J	**0.043**	
	PT6-MW1-68	1/25/2023	0.070	U	0.15	U	0.070	U	0.25	U	0.43		0.070	U	0.25	U	0.070	U	**0.32**		0.090	U
MW1-76	MW1-76-220429	4/29/2022	0.537	J	0.50	U	16		2.0	U	**8,820**		**147**		0.60	U	0.50	U	**4,280**		**924**	
	PT1-MW1-76	8/22/2022	0.50	U	0.80	U	0.34	J	0.39	J	**110**	J-	1.5		0.80	U	0.80	U	**100**	J-	**16**	
	PT3-MW1-76	10/25/2022	0.50	U	0.80	U	0.50	U	0.80	U	**26**	J-	0.80	U	0.80	U	0.80	U	**29**		**3.7**	J-
	PT6-MW1-76	1/23/2023	0.19	J	0.15	U	2.8		0.26	J	**640**		7.1		0.25	U	0.070	U	**350**		**89**	
MW1-77	MW1-77-220429	4/29/2022	0.50	U	0.50	U	6.07		0.64	J	**581**		42.3		0.60	U	0.50	U	**42.5**		**130**	
	FD-220429-01 (Dup)	4/29/2022	0.50	U	0.50	U	6.51		1.45	J	**571**		43.7		0.60	U	0.50	U	**47.4**		**136**	
	PT1-MW1-77	8/23/2022	0.50	U	0.80	U	1.8		3.7		**310**	J-	18		0.80	U	0.80	U	**65**	J-	**140**	J-
	PT1-P1-06	8/22/2023	3.3		0.80	U	**10**		6.9		**4,300**	J-	43		0.80	U	0.80	U	**1,300**	J-	**510**	J-

Table D-53. Pre- and Post-Pilot Test Groundwater Sampling Analytical Data

P1-6	PT3-P1-06	10/25/2022	13	UJ	20	UJ	**11**	J-	20	UJ	**2,200**	J-	26	J-	20	UJ	20	UJ	**950**	J-	**280**	J-

		Analyte	1,1-Dichloroethane		1,2-Dichloroethane		1,1-Dichloroethene		Chloroethane		*cis*-1,2-Dichloroethene		*trans*-1,2-Dichloroethene		Tetrachloroethene		1,1,1-Trichloroethane		Trichloroethene		Vinyl chloride	
		Unit	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		PAL	7.7		0.48		7.0		7.7		16		100		2.4		200		0.30		0.020	
Location	**Sample ID**	**Sample Date**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**
	PT6-P1-06	1/25/2023	25	U	40	U	25	U	40	U	**370**		40	U	40	U	40	U	**17**	J	**320**	
P1-7	PT1-P1-07	8/22/2022	7.0	U	15	U	7.0	U	25	U	**460**		6.3	J	25	U	7.0	U	**680**		**43**	
	PT3-P1-07	10/25/2022	5.0	U	8.0	U	5.0	U	8.0	U	**270**		8.0	U	8.0	U	8.0	U	**360**		**17**	
	PT6-P1-07	1/23/2023	5.0	U	8.0	U	**9.9**	J	8.0	U	**7,000**	J-	49		8.0	U	8.0	U	**5,300**	J-	**510**	
P1-10	PT1-P1-10	8/22/2022	3.5	U	7.5	U	3.8	J	**15**	J	**300**		13		13	U	3.5	U	**45**		**92**	
	PT3-P1-10	10/26/2022	5.0	U	8.0	U	5.0	U	**9.0**	J	**200**		8.1	J	8.0	U	8.0	U	**30**		**67**	J
	PT6-P1-10	1/25/2023	5.0	U	8.0	U	**14**		5.3	J	**4,000**	J-	53		8.0	U	8.0	U	**2,100**	J-	**630**	J-

Notes:
Detected results exceeding the Project Action Level are boldfaced and shaded grey.
Limits of detection for non-detected results exceeding the Project Action Level are shaded grey.
Detected results exceeding the Project Action Level are boldfaced and shaded grey.
Limits of detection for non-detected results exceeding the Project Action Level are shaded grey.
Sample collected by Sealaska Environmental Services or Battelle before the pilot test.
PAL = Project Action Level
µg/L = microgram(s) per liter
(Dup) = field duplicate

Data Qualifiers:
J = The reported result is an estimated value.
J- = The reported result is an estimated value with a low bias.
R = The result is rejected.
U = The analyte is not detected at the associated limit of detection.
UJ = The analyte is not detected; the associated limit of detection is approximate.

Table D-54. Pre- and Post-Pilot Test Porewater Sampling Analytical Data

		Analyte	1,1-Dichloroethane		1,2-Dichloroethane		1,1-Dichloroethene		Chloroethane		*cis*-1,2-Dichloroethene		trans-1,2-Dichloroethene		Tetrachloroethene		1,1,1-Trichloroethane		Trichloroethene		Vinyl chloride	
		Unit	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		PAL	7.7		0.48		7.0		7.7		16		100		2.4		200		0.30		0.020	
Location	Sample ID	Sample Date	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
PW1-2	PT1-PW1-2	8/23/2022	0.50	UJ	0.80	UJ	0.50	UJ	1.6	J-	11	J-	0.80	UJ	0.80	UJ	0.80	UJ	0.50	UJ	**150**	J-
	PT1-PW1-2-A (Dup)	8/23/2022	50	U	80	U	50	U	80	U		R	80	U	80	U	80	UJ		R	**150**	
	PT3-PW1-2	10/24/2022	0.50	U	0.80	U	0.50	U	0.80	U	0.43	J	0.80	U	0.80	U	0.80	U	0.50	U	**10**	
	PT3-PW1-2-A (Dup)	10/24/2022	0.50	U	0.80	U	0.50	U	0.80	U	0.80	U	0.80	U	0.80	U	0.80	U	0.50	U	**11**	
	PT6-PW1-2	1/24/2023	0.070	U	0.15	U	0.070	U	0.25	U	5.5		0.087	J	0.25	U	0.070	U	**0.57**		**7.4**	
	PT6-PW1-2-A (Dup)	1/24/2023	0.070	U	0.15	U	0.070	U	0.25	U	5.7		0.10	J	0.25	U	0.070	U	**0.57**		**7.7**	
PW1-10	PT1-PW1-10	8/23/2022	50	U	80	U	50	U	80	U	**120**	J-	80	U	80	U	80	UJ	**67**	J-	**120**	
	PT3-PW1-10	10/24/2022	0.50	U	0.80	U	0.50	U	0.80	U	**56**		1.1		0.80	U	0.80	U	**1.7**		**8.7**	
	PT6-PW1-10	1/24/2023	5.0	U	8.0	U	5.0	U	8.0	U	**190**		8.0	U	8.0	U	8.0	U	**45**		**5.2**	J
PW1-11	PW1-11-190606	6/6/2019	0.30	U	0.30	U	0.50	U	0.50	U	**64**		0.51	J	0.30	U	0.30	U	0.30	U	**26**	
	PT1-PW1-11	8/23/2022	2.5	U	4.0	U	2.5	U	4.0	U	**370**	J-	14		4.0	U	4.0	UJ		R	**180**	
	PT3-PW1-11	10/24/2022	5.0	U	8.0	U	5.0	U	8.0	U	**160**		8.0	U	8.0	U	8.0	U	5.0	U	**48**	
	PT6-PW1-11	1/24/2023	0.50	U	0.80	U	0.50	U	0.80	U	13		0.69	J	0.80	U	0.80	U	**0.37**	J	**4.8**	
PW1-15	PW1-15-190606	6/6/2019	0.30	U	0.30	U	0.50	U	0.50	U	0.30	U	0.30	U	0.30	U	0.30	U	0.30	U	0.015	U
	PT1-PW1-15	8/23/2022	0.50	U	0.80	U	0.50	U	0.80	U	0.80	UJ	0.80	U	0.80	U	0.80	U	0.50	UJ	0.50	U
	PT3-PW1-15	10/24/2022	0.070	U	0.15	U	0.070	U	0.25	U	0.15	U	0.070	U	0.25	U	0.070	U	0.15	U	0.015	U
	PT6-PW1-15	1/24/2023	0.070	U	0.15	U	0.070	U	0.25	U	0.15	U	0.070	U	0.25	U	0.070	U	0.15	U	0.090	U
PW1-16	PW1-16-190606	6/6/2019	0.30	U	0.30	U	0.50	U	0.50	U	0.30	U	0.30	U	0.30	U	0.30	U	0.30	U	0.015	U
	PT1-PW1-16	8/23/2022	2.5	U	4.0	U	2.5	U	4.0	U		R	4.0	U	4.0	U	4.0	UJ		R	2.5	U
	PT3-PW1-16	10/24/2022	0.070	U	0.15	U	0.070	U	0.25	U	0.15	U	0.070	U	0.25	U	0.070	U	0.15	U	0.015	U
PW1-28	PW1-28-190606	6/6/2019	0.30	U	0.30	U	0.50	U	0.50	U	**27**		0.30	U	0.30	U	0.30	U	**0.39**	J	**7.5**	
PW1-29	PW1-29-190606	6/6/2019	0.30	U	0.30	U	0.50	U	0.50	U	**52**		0.30	U	0.30	U	0.30	U	**2.0**		**11**	
	PT1-PW1-29	8/23/2022	2.5	U	4.0	U	2.5	U	4.0	U		R	4.0	U	4.0	U	4.0	UJ		R	2.5	U
	PT3-PW1-29	10/24/2022	0.070	U	0.15	U	0.070	U	0.25	U	0.15	U	0.070	U	0.25	U	0.070	U	0.15	U	0.015	U
S-4	PT1-S-4	8/23/2022	2.5	U	4.0	U	2.5	U	4.0	U	**360**	J-	11		4.0	U	4.0	UJ	**17**	J-	**740**	
	PT3-S-4	10/24/2022	5.0	U	8.0	U	5.0	U	8.0	U	**31**		8.0	U	8.0	U	8.0	U	5.0	U	**130**	
	PT6-S-4	1/24/2023	5.0	U	8.0	U	5.0	U	8.0	U	**280**		8.0	U	8.0	U	8.0	U	**29**		**240**	
S-4B	PT1-S-4B	8/23/2022	2.5	U	4.0	U	2.5	U	4.0	U	7.6	J-	4.0	U	4.0	U	4.0	UJ	**13**	J-	**2.6**	J
	PT3-S-4B	10/24/2022	0.35	U	0.75	U	0.35	U	1.3	U	8.7		0.35	U	1.3	U	0.35	U	**23**		**2.7**	
	PT6-S-4B	1/24/2023	0.070	U	0.15	U	0.36		0.25	U	**32**		0.44		0.25	U	0.070	U	**16**		**24**	
S-5	PT1-S-5	8/23/2022	0.50	U	0.80	U	0.50	U	0.80	U	1.4	J-	0.80	UJ	0.80	U	0.80	UJ	**0.60**	J-	**1.2**	
	PT3-S-5	10/24/2022	0.070	U	0.15	U	0.070	U	0.25	U	0.15	U	0.070	U	0.25	U	0.070	U	0.15	U	0.015	U
	PT6-S-5	1/24/2023	0.070	U	0.15	U	0.47		0.25	U	8.6		0.16	J	0.25	U	0.070	U	**3.3**		**13**	

Notes:

Detected results exceeding the Project Action Level are boldfaced and shaded grey.

Limits of detection for non-detected results exceeding the Project Action Level are shaded grey.

Sample collected by Battelle before the pilot test.

PAL = Project Action Level

µg/L = microgram(s) per liter

(Dup) = field duplicate

Data Qualifiers:

J = The reported result is an estimated value.

Table D-54. Pre- and Post-Pilot Test Porewater Sampling Analytical Data

Notes: (continued)
J- = The reported result is an estimated value with a low bias.
R = The result is rejected.
U = The analyte is not detected at the associated limit of detection.
UJ = The analyte is not detected; the associated limit of detection is approximate.

Table D-55. Pre- and Post-Pilot Test Surface Water Sampling Analytical Data

		Analyte	1,1-Dichloroethane		1,2-Dichloroethane		1,1-Dichloroethene		Chloroethane		*cis*-1,2-Dichloroethene		*trans*-1,2-Dichloroethene		Tetrachloroethene		1,1,1-Trichloroethane		Trichloroethene		Vinyl chloride	
		Unit	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		PAL	None		8.9		300		None		None		100		2.4		10000		0.30		0.020	
Location	Sample ID	Sample Date	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
MA12	AREA-1-19-226	6/18/2019	0.24		0.20	U	0.48		--		240		1.2		0.50	U	0.20	U	**15**		**12**	
	AREA-1-19-227 (Dup)	6/18/2019	0.22		0.20	U	0.47		--		230		1.2		0.50	U	0.20	U	**15**		**11**	
	PT1-MA12	8/23/2022	0.50	U	0.80	U	0.50	U	0.80	U	0.44	J-	0.80	U	0.80	U	0.80	UJ		R	0.50	U
	PT1-MA12-A (Dup)	8/23/2022	0.50	U	0.80	U	0.50	U	0.80	U	0.49	J-	0.80	U	0.80	U	0.80	UJ		R	0.50	U
	PT3-MA12	10/24/2022	0.093	J	0.15	U	0.070	U	0.25	U	1.8		0.070	U	0.25	U	0.070	U	**0.4**		**0.89**	
	PT3-MA12A (Dup)	1/24/2023	0.12	J	0.15	U	0.070	U	0.25	U	1.8		0.070	U	0.25	U	0.070	U	**0.38**		**1.4**	
	PT6-MA12	1/24/2023	0.21		0.15	U	0.22		1.1		51		0.57		0.25	U	0.070	U	**6.6**		**14**	
	PT6-MA12-A (Dup)	1/24/2023	0.24		0.15	U	0.17	J	1.2		55		0.60		0.25	U	0.070	U	**6.3**		**13**	
SW1-07	PT1-SW1-07	8/23/2022	2.5	U	4.0	U	2.5	U	4.0	U		R	4.0	U	4.0	U	4.0	UJ	**1.3**	J-	2.5	U
	PT3-SW1-07	10/24/2022	0.070	U	0.15	U	0.070	U	0.25	U	0.15	U	0.070	U	0.25	U	0.070	U	0.15	U	0.015	U
	PT6-SW1-07	1/24/2023	0.16	J	0.15	U	0.24		0.25	U	77		0.57		0.25	U	0.070	U	**24**		**0.19**	
SW1-08	PT1-SW1-08	8/23/2022	0.50	U	0.80	U	0.50	U	0.80	U	0.80	UJ	0.80	U	0.80	U	0.80	U	0.50	UJ	**0.23**	J
	PT3-SW1-08	10/24/2022	0.070	U	0.15	U	0.070	U	0.25	U	0.15	U	0.070	U	0.25	U	0.070	U	0.28		0.015	U
	PT6-SW1-08	1/24/2023	0.070	U	0.15	U	0.070	U	0.25	U	2.5		0.070	U	0.25	U	0.070	U	**0.98**		**0.12**	
SW1-09	PT1-SW1-09	8/23/2022	0.50	U	0.80	U	0.50	U	0.80	U	2.3	J-	0.80	U	0.80	U	0.80	UJ	**2.1**	J-	**0.40**	J
	PT3-SW1-09	10/24/2022	0.070	U	0.15	U	0.057	J	0.25	U	4.7		0.070	U	0.25	U	0.070	U	**4.2**		**2.1**	
	PT6-SW1-09	1/24/2023	0.070	U	0.15	U	0.070	U	0.25	U	11		0.089	J	0.25	U	0.070	U	**6.6**		**0.31**	
SW1-10	PT1-SW1-10	8/23/2022	2.5	U	4.0	U	2.5	U	4.0	U	79	J-	4.0	U	4.0	U	4.0	UJ		R	**140**	
	PT3-SW1-10	10/24/2022	0.50	U	0.80	U	0.50	U	0.80	U	0.82	J	0.80	U	0.80	U	0.80	U	**0.38**	J	**0.66**	J
	PT6-SW1-10	1/24/2023	0.12	J	0.15	U	0.45		0.25	J	49		0.35		0.25	U	0.070	U	**6.0**		**40**	
SW1-11	PT1-SW1-11	8/23/2022	0.50	U	0.80	U	0.50	U	0.80	U	1.7	J-	0.80	U	0.80	U	0.80	UJ		R	**0.92**	J
	PT3-SW1-11	10/24/2022	0.055	J	0.15	U	0.048	J	0.25	U	3.7		0.070	U	0.25	U	0.070	U	**0.76**		**2.9**	
	PT6-SW1-11	1/24/2023	0.13	J	0.15	U	0.19	J	0.84		67		0.56		0.25	U	0.070	U	**7.5**		**18**	

Notes:

Detected results exceeding the Project Action Level are boldfaced and shaded grey.

Limits of detection for non-detected results exceeding the Project Action Level are shaded grey.

Sample collected by Sealaska Environmental Services before the pilot test.

PAL = Project Action Level

µg/L = microgram(s) per liter

(Dup) = field duplicate

Data Qualifiers:

J = The reported result is an estimated value.

J- = The reported result is an estimated value with a low bias.

R = The result is rejected.

U = The analyte is not detected at the associated limit of detection.

UJ = The analyte is not detected; the associated limit of detection is approximate.

Appendix E: OU 2 AREA 2 CUMULATIVE LONG-TERM MONITORING DATA

Table E-1. Target Analytes in Groundwater at OU 2 Area 2 (November 1995 – June 2023)

Location	Sampling Date	cis,1,2-DCE (µg/L)	TCE (µg/L)	Vinyl Chloride (µg/L)
Remedial Goal (Drinking Water)[a]		**16[e]**	**5[f]**	**0.029[g]**
2MW-1	11/21/95	1 U	**41 J**	1 U *
	09/30/96	1 U	**28**	1 U *
	10/16/97	1 U	**29**	1 U *
	10/08/98	0.2 U	**29**	0.2 U *
	11/22/99	0.5 U	**17**	0.5 U *
	11/17/00	0.5 U	**22**	0.5 UJ *
	11/19/01	0.1 U	**16**	0.2 U *
	06/17/02	0.1 U	**11**	0.2 U *
	06/18/03	0.067 U	**12**	0.12 U *
	06/15/04	0.067 U	**9.7**	0.12 U *
	06/21/05	0.2 U	**10**	0.2 U *
	06/20/06	0.5 U	**8.1**	0.2 U *
	06/12/07	0.5 U	**5.8**	0.2 U *
	05/06/08	0.5 U	4.9	0.2 U *
	06/24/09	0.21 J	**5.8 J**	0.2 U *
	06/15/10	NS	NS	NS
	07/20/11	0.08 J	3.8	0.2 U *
	06/13/12	0.059	3.8	0.010 J
	06/24/14	0.089	1.2	0.018 J
	06/21/16	NA	NA	0.022 U
	09/20/18	NA	NA	0.021 J
	06/24/19	NA	NA	0.020 U
	06/15/23	NA	1.1	0.012 U
2MW-3	11/20/95	**19**	1 J	**4**
2MW-4	11/20/95	1 U	1 U	1 U *
2MW-5	11/21/95	7	**11**	**1**
	09/30/96	1	2	**1**
	10/16/97	1	2	**1**
	10/08/98	0.26	2.1	**0.2**
	11/22/99	0.5	0.4 J	**0.5**
2MW-6	11/20/95	10	1 U	**4**
	09/30/96	15	1 U	**5**
	10/16/97	11	1 U	**4**
	10/08/98	9.5	0.2 U	**2.7**
	11/22/99	12	0.5 U	**2.7**
	11/17/00	15	0.5 U	**2.9 J**
	11/19/01	7 J	0.2 UJ	**1.2 J**
	06/17/02	13	0.2 U	**2.1**
	06/18/03	9.9	0.081 U	**1.5**
	06/15/04	6.9	0.081 U	**0.86**
	06/21/05	4.5	0.2 U	**0.68**
	06/21/06	9	0.5 U	**1.1**
	06/13/07	8.4	0.5 U	**0.99**
	05/07/08	2.7	0.5 U	**0.34**
	06/24/09	7.1	0.03 J	**0.99**

Table E-1. Target Analytes in Groundwater at OU 2 Area 2 (November 1995 – June 2023)

Location	Sampling Date	cis,1,2-DCE (µg/L)	TCE (µg/L)	Vinyl Chloride (µg/L)
Remedial Goal (Drinking Water)[a]		**16[e]**	**5[f]**	**0.029[g]**
	06/15/10	3.5	0.5 U	**0.32**
	07/20/11	1.5	0.5 U	**0.09 J**
	06/13/12	1.7	0.018 J	**0.099**
	06/23/14	3.9	0.021 UJ	**0.220**
	06/21/16	NA	NA	**0.073**
	09/20/18	NA	NA	**1.4**
	06/24/19	NA	NA	**0.16 M**
	04/26/23	NA	0.025 J	0.012 UJ
2MW-9	7/11/22	0.15 U	0.15 U	0.015 U
	4/26/23	NA	0.040 U	0.012 UJ
2MW-10	7/11/22	0.15 U	0.15 U	0.015 U
	4/26/23	NA	0.040 U	0.014 J
2MW-11	7/08/22	10	4.7	**2.0**
	4/25/23	NA	4.2	**3.0 J**
2MW-12	7/08/22	1.2 J	**7.6**	**0.7**
	4/25/23	NA	0.53 J	**0.92 J**
2MW-13	7/11/22	1.3	0.40	**0.090**
	4/25/23	NA	0.048 J	**0.029 J**
2MW-14	7/11/22	13	0.15 U	**0.47**
	4/26/23	NA	0.026 J	**0.055 J**
2MW-15	7/11/22	0.15 U	0.15 U	0.015 U
	4/25/23	NA	0.040 U	0.012 UJ
2MW-16	7/11/22	0.15 U	0.15 U	0.015 U
	4/25/23	NA	0.11 J	0.012 UJ
2MW-17	7/08/22	1.9	0.15 U	0.015 U
	4/25/23	NA	**120 J**	**0.46 J**
2MW-18	7/08/22	0.083 J	0.24 J	0.015 U
	4/25/23	NA	0.052 J	0.012 UJ
2MW-19	7/11/22	0.15 U	0.15 U	**0.34**
	4/26/23	NA	0.046 J	0.012 UJ
MW2-6[c]	11/17/00	0.5 U	0.5 U	0.5 U *
MW2-8[d]	11/19/01	0.72	0.2 U	0.2 U *
	06/17/02	0.97	0.2 U	0.2 U *
	06/18/03	1.4	0.081 U	0.12 U *
	06/15/04	1.9	0.081 U	**0.2 J**
	06/24/05	1.9	0.2 U	0.2 U *
	06/20/06	2	0.5 U	0.2 U *
	06/12/07	1.9	0.5 U	**0.2**
	05/06/08	1.4	0.5 U	**0.07 J**
	06/24/09	1.1	0.5 U	**0.07 J**
	06/15/10	1.1	0.5 U	0.2 UJ *
	07/20/11	1.2	0.5 U	0.2 U *
	06/13/12	0.92 J	0.0045 J	**0.035**
	06/23/14	0.43	0.02 U	0.016 J
	06/21/16	NA	NA	0.020 U
	09/20/18	NA	NA	**0.049 J**

Table E-1. Target Analytes in Groundwater at OU 2 Area 2 (November 1995 – June 2023)

Location	Sampling Date	cis,1,2-DCE (µg/L)	TCE (µg/L)	Vinyl Chloride (µg/L)
Remedial Goal (Drinking Water)[a]		**16[e]**	**5[f]**	**0.029[g]**
	06/24/19	NA	NA	0.020 U
	04/25/23	NA	0.022 J	0.012 U

[a] Protection of human health by ingestion.
[b] The 11/17/00 and 11/19/01 results for 2MW-6 are the average concentrations of the primary and duplicate sample.
[c] Prior to 2000, MW2-6 was last sampled in 1991 during the remedial investigation.
[d] The 06/17/02 results for MW2-8 are the average concentrations of the primary and duplicate sample.
[e] No remedial goal for cis-1,2-DCE was established in the Record of Decision (U.S. Navy, USEPA, Ecology, 1994). For comparison purposes, the current MTCA Method B value is shown in the table.
[f] Value listed accounts for adjustment when the maximum contaminant level or water quality standard is sufficiently protective to serve as the MTCA cleanup level for that individual chemical. Individual chemical cleanup levels may require downward adjustment for multiple chemical contaminants or multiple exposure pathways (WAC 173-340-720[7][b]). Value does not account for adjustments due to background levels or PQLs.
[g] Calculated MTCA Method B remedial goal starting in 2012, based upon the current oral slope value.

Notes:

Bolded value indicates it exceeds or is equal to the remedial goal for drinking water.
Yellow highlighted rows indicate sampling results from this FYR period.
* – The reporting limit exceeds the remedial goal
DCE – dichloroethane
J – The result is an estimated concentration that is less than the MRL, but greater than or equal to the MDL.
M – Laboratory performed a manual integration on the chromatographic peak.
MDL – method detection limit
µg/L – microgram per liter
MRL – method reporting limit
MTCA – Model Toxics Control Act
NA – Compound not analyzed for per recommendation in the fourth FYR.
NS – not sampled
PQL – practical quantitation limits
TCE – trichloroethene
U – The compound was analyzed for but was not detected ("nondetect") at or above the MRL/MDL.

Table E-2. 1,4-Dioxane in Groundwater at OU 2 Area 2 (June 2007 – June 2019)

Location	Sampling Date	1,4-Dioxane (µg/L)
MTCA Method B Cleanup Level		**0.44[a]**
2MW-1	06/12/07	1.0 U
	06/20/17	0.40 U
	09/20/18	0.40 U
	06/24/19	0.19 U
2MW-6	06/13/07	0.30 J
	06/20/17	0.40 U
	09/19/18	0.17 J
	06/24/19	0.19 U
MW2-8	06/12/07	1.0 U
	06/20/17	0.40 U
	09/20/18	0.40 U
	06/24/19	0.19 U

[a] No remedial goal for 1,4-dioxane was established in the Record of Decision (U.S. Navy, USEPA, Ecology, 1994). For comparison purposes, the MTCA Method B (carcinogenic) cleanup level is provided in the table.

Notes:

Bold indicates detected value is equal to or exceeds the MTCA Method B cleanup level.

J – estimated concentration

U – not detected at or above the practical quantitation limit shown

µg/L – micrograms per liter

Appendix F: OU 2 AREA 2 DATA COLLECTED DURING FYR PERIOD

Table F-1. Soil Sampling Analytical Data

Location ID Sample Depth (bgs) Sample Collection Date			SB-9 0.5 ft 29-Jun-2022		SB-9 10 ft 29-Jun-2022		SB-9 10 ft (DUP) 29-Jun-2022		SB-9 20 ft 29-Jun-2022		SB-9 30 ft 29-Jun-2022		SB-9 40 ft 29-Jun-2022		SB-10 0.5 ft 29-Jun-2022		SB-10 10 ft 29-Jun-2022	
Analyte	Project Action Level	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
1,1,1,2-Tetrachloroethane	0.00063	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0013	UJ	0.16	UJ	0.0012	U	0.0014	U	0.0012	UJ
1,1,1-Trichloroethane	0.084	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0013	U	0.079	UJ	0.0012	U	0.0014	U	0.0012	UJ
1,1,2,2-Tetrachloroethane	0.000037	mg/kg	0.00061	U	0.00054	U	0.00055	U	0.00063	UJ	0.039	UJ	0.00061	U	0.00068	U	0.00061	UJ
1,1,2-Trichloroethane	0.00013	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0013	UJ	0.079	UJ	0.0012	U	0.0014	U	0.0012	UJ
1,1-Dichloroethane	0.0026	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0013	U	0.079	UJ	0.0012	U	0.0014	U	0.0012	UJ
1,1-Dichloroethene	0.0025	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0013	U	0.079	UJ	0.0012	U	0.0014	U	0.0012	UJ
1,1-Dichloropropene	NC	mg/kg	0.0012	U	0.0011	UJ	0.0011	UJ	0.0013	UJ	0.079	UJ	0.0012	U	0.0014	U	0.0012	UJ
1,2,3-Trichlorobenzene	0.011	mg/kg	0.0049	U	0.0043	U	0.0044	U	0.005	UJ	0.32	UJ	0.0049	U	0.0055	U	0.42	UJ
1,2,3-Trichloropropane	0.00000015	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0013	UJ	0.079	UJ	0.0012	U	0.0014	U	0.0012	UJ
1,2,4-Trichlorobenzene	0.000070	mg/kg	0.0049	U	0.0043	U	0.0044	U	0.005	UJ	0.32	UJ	0.0049	U	0.0055	U	0.42	UJ
1,2-Dichlorobenzene	0.40	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0013	UJ	0.079	UJ	0.0012	U	0.0014	U	0.0012	UJ
1,2-Dichloroethane	0.0016	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0013	U	0.079	UJ	0.0012	U	0.0014	U	0.0012	UJ
1,2-Dichloropropane	0.00024	mg/kg	0.0012	U	0.0011	UJ	0.0011	UJ	0.0013	UJ	0.079	UJ	0.0012	U	0.0014	U	0.0012	UJ
1,3-Dichlorobenzene	0.0013	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0013	UJ	0.079	UJ	0.0012	U	0.0014	U	0.0012	UJ
1,3-Dichloropropane	0.057	mg/kg	0.00061	U	0.00054	U	0.00055	U	0.00063	UJ	0.039	UJ	0.00061	U	0.00068	U	0.00061	UJ
1,4-Dichlorobenzene	0.068	mg/kg	0.00061	U	0.00054	U	0.00055	U	0.00063	UJ	0.039	UJ	0.00061	U	0.00068	U	0.00061	UJ
2,2-Dichloropropane	NC	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0013	U	0.079	UJ	0.0012	U	0.0014	U	0.0012	UJ
2-Chlorotoluene	0.11	mg/kg	0.00061	U	0.00054	U	0.00055	U	0.00063	UJ	0.039	UJ	0.00061	U	0.00068	U	0.00061	UJ
4-Chlorotoluene	NC	mg/kg	0.00061	U	0.00054	U	0.00055	U	0.00063	UJ	0.039	UJ	0.00061	U	0.00068	U	0.052	UJ
Carbon tetrachloride	0.000088	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0013	U	0.16	UJ	0.0012	U	0.0014	U	0.0012	UJ
Chlorobenzene	0.051	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0013	UJ	0.079	UJ	0.0012	U	0.0014	U	0.0012	UJ
Chloroethane	NC	mg/kg	0.0024	U	0.0022	U	0.0022	U	0.0025	U	0.16	UJ	0.0024	U	0.0027	U	0.0025	UJ
Chloroform	0.0048	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0013	U	0.079	UJ	0.0012	U	0.0014	U	0.0012	UJ
Chloromethane	NC	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0013	U	0.079	UJ	0.0012	U	0.0014	U	0.0012	UJ
cis-1,2-Dichloroethene	0.0052	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0013	U	0.079	UJ	0.0012	U	0.0014	U	0.0012	UJ
cis-1,3-Dichloropropene	0.000069 [1/]	mg/kg	0.00061	U	0.00054	U	0.00055	U	0.00063	U	0.039	UJ	0.00061	U	0.00068	U	0.00061	UJ
Hexachlorobutadiene	0.000011	mg/kg	0.0049	U	0.0043	U	0.0044	U	0.005	UJ	0.32	UJ	0.0049	U	0.0055	U	0.42	UJ
Methylene chloride	0.0015	mg/kg	0.0024	U	0.0022	U	0.0022	U	0.0025	U	0.16	UJ	0.0024	U	0.0027	U	0.0025	UJ
Tetrachloroethene	0.0013	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0013	UJ	0.079	UJ	0.0012	U	0.0014	U	0.0012	UJ
trans-1,2-Dichloroethene	0.023 [2/]	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0013	U	0.079	UJ	0.0012	U	0.0014	U	0.0012	UJ
trans-1,3-Dichloropropene	0.000069 [1/]	mg/kg	0.00061	U	0.00054	U	0.00055	U	0.00063	UJ	0.039	UJ	0.00061	U	0.00068	U	0.00061	UJ
Trichloroethene	0.00011	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0013	U	0.079	UJ	0.0012	U	0.0014	U	0.0012	UJ
Vinyl chloride	0.0000062	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0013	U	0.079	UJ	0.0012	U	0.0014	U	0.0012	UJ

Table F-1. Soil Sampling Analytical Data

Location ID Sample Depth (bgs) Sample Collection Date			SB-10 20 ft 29-Jun-2022		SB-10 30 ft 29-Jun-2022		SB-10 40 ft 29-Jun-2022		SB-11 0.5 ft 28-Jun-2022		SB-11 5 ft 28-Jun-2022		SB-11 5 ft (DUP) 28-Jun-2022		SB-11 10 ft 28-Jun-2022		SB-11 15 ft 28-Jun-2022	
Analyte	Project Action Level	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
1,1,1,2-Tetrachloroethane	0.00063	mg/kg	0.0013	U	0.0012	U	0.0011	U		R		R		R		R		R
1,1,1-Trichloroethane	0.084	mg/kg	0.0013	U	0.0012	U	0.0011	U		R		R		R		R		R
1,1,2,2-Tetrachloroethane	0.000037	mg/kg	0.00066	U	0.00059	U	0.00057	U		R		R		R		R		R
1,1,2-Trichloroethane	0.00013	mg/kg	0.0013	U	0.0012	U	0.0011	U		R		R		R		R		R
1,1-Dichloroethane	0.0026	mg/kg	0.0013	U	0.0012	U	0.0011	U		R		R		R		R		R
1,1-Dichloroethene	0.0025	mg/kg	0.0013	U	0.0012	U	0.0011	U		R		R		R		R		R
1,1-Dichloropropene	NC	mg/kg	0.0013	U	0.0012	U	0.0011	U		R		R		R		R		R
1,2,3-Trichlorobenzene	0.011	mg/kg	0.0053	U	0.0047	U	0.0045	U		R		R		R		R		R
1,2,3-Trichloropropane	0.00000015	mg/kg	0.0013	U	0.0012	U	0.0011	U		R		R		R		R		R
1,2,4-Trichlorobenzene	0.000070	mg/kg	0.0053	U	0.0047	U	0.0045	U		R		R		R		R		R
1,2-Dichlorobenzene	0.40	mg/kg	0.0013	U	0.0012	U	0.0011	U		R		R		R		R		R
1,2-Dichloroethane	0.0016	mg/kg	0.0013	U	0.0012	U	0.0011	U		R		R		R		R		R
1,2-Dichloropropane	0.00024	mg/kg	0.0013	U	0.0012	U	0.0011	U		R		R		R		R		R
1,3-Dichlorobenzene	0.0013	mg/kg	0.0013	U	0.0012	U	0.0011	U		R		R		R		R		R
1,3-Dichloropropane	0.057	mg/kg	0.00066	U	0.00059	U	0.00057	U		R		R		R		R		R
1,4-Dichlorobenzene	0.068	mg/kg	0.00066	U	0.00059	U	0.00057	U		R		R		R		R		R
2,2-Dichloropropane	NC	mg/kg	0.0013	U	0.0012	U	0.0011	U		R		R		R		R		R
2-Chlorotoluene	0.11	mg/kg	0.00066	U	0.00059	U	0.00057	U		R		R		R		R		R
4-Chlorotoluene	NC	mg/kg	0.00066	U	0.00059	U	0.00057	U		R		R		R		R		R
Carbon tetrachloride	0.000088	mg/kg	0.0013	U	0.0012	U	0.0011	U		R		R		R		R		R
Chlorobenzene	0.051	mg/kg	0.0013	U	0.0012	U	0.0011	U		R		R		R		R		R
Chloroethane	NC	mg/kg	0.0026	U	0.0024	U	0.0023	U		R		R		R		R		R
Chloroform	0.0048	mg/kg	0.0013	U	0.0012	U	0.0011	U		R		R		R		R		R
Chloromethane	NC	mg/kg	0.0013	U	0.0012	U	0.0011	U		R		R		R		R		R
cis-1,2-Dichloroethene	0.0052	mg/kg	0.0013	U	0.0012	U	0.0011	U		R		R		R		R	0.0011	J
cis-1,3-Dichloropropene	0.000069 [1/]	mg/kg	0.00066	U	0.00059	U	0.00057	U		R		R		R		R		R
Hexachlorobutadiene	0.000011	mg/kg	0.0053	U	0.0047	U	0.0045	U		R		R		R		R		R
Methylene chloride	0.0015	mg/kg	0.0026	U	0.0024	U	0.0023	U		R		R		R		R		R
Tetrachloroethene	0.0013	mg/kg	0.0013	U	0.0012	U	0.0011	U		R		R		R		R		R
trans-1,2-Dichloroethene	0.023 [2/]	mg/kg	0.0013	U	0.0012	U	0.0011	U		R		R		R		R		R
trans-1,3-Dichloropropene	0.000069 [1/]	mg/kg	0.00066	U	0.00059	U	0.00057	U		R		R		R		R		R
Trichloroethene	0.00011	mg/kg	0.0013	U	0.0012	U	0.0011	U		R		R		R		R		R
Vinyl chloride	0.0000062	mg/kg	0.0013	U	0.0012	U	0.0011	U		R		R		R		R		R

Table F-1. Soil Sampling Analytical Data

Location ID Sample Depth (bgs) Sample Collection Date			SB-11 20 ft 28-Jun-2022		SB-12 0.5 ft 28-Jun-2022		SB-12 5 ft 28-Jun-2022		SB-12 10 ft 28-Jun-2022		SB-12 20 ft 28-Jun-2022		SB-12 20 ft (DUP) 28-Jun-2022		SB-12 25 ft 28-Jun-2022		SB-13 0.5 ft 28-Jun-2022	
Analyte	Project Action Level	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
1,1,1,2-Tetrachloroethane	0.00063	mg/kg		R		R		R		R		R		R		R	0.001	U
1,1,1-Trichloroethane	0.084	mg/kg		R		R		R		R		R		R		R	0.001	U
1,1,2,2-Tetrachloroethane	0.000037	mg/kg		R		R		R		R		R		R		R	0.00051	U
1,1,2-Trichloroethane	0.00013	mg/kg		R		R		R		R		R		R		R	0.001	U
1,1-Dichloroethane	0.0026	mg/kg		R		R		R		R		R		R		R	0.001	U
1,1-Dichloroethene	0.0025	mg/kg		R		R		R		R		R		R		R	0.001	U
1,1-Dichloropropene	NC	mg/kg		R		R		R		R		R		R		R	0.001	UJ
1,2,3-Trichlorobenzene	0.011	mg/kg		R		R		R		R		R		R		R	0.0041	U
1,2,3-Trichloropropane	0.00000015	mg/kg		R		R		R		R		R		R		R	0.001	U
1,2,4-Trichlorobenzene	0.000070	mg/kg		R		R		R		R		R		R		R	0.0041	U
1,2-Dichlorobenzene	0.40	mg/kg		R		R		R		R		R		R		R	0.001	U
1,2-Dichloroethane	0.0016	mg/kg		R		R		R		R		R		R		R	0.001	U
1,2-Dichloropropane	0.00024	mg/kg		R		R		R		R		R		R		R	0.001	UJ
1,3-Dichlorobenzene	0.0013	mg/kg		R		R		R		R		R		R		R	0.001	U
1,3-Dichloropropane	0.057	mg/kg		R		R		R		R		R		R		R	0.00051	U
1,4-Dichlorobenzene	0.068	mg/kg		R		R		R		R		R		R		R	0.00051	U
2,2-Dichloropropane	NC	mg/kg		R		R		R		R		R		R		R	0.001	U
2-Chlorotoluene	0.11	mg/kg		R		R		R		R		R		R		R	0.00051	U
4-Chlorotoluene	NC	mg/kg		R		R		R		R		R		R		R	0.00051	U
Carbon tetrachloride	0.000088	mg/kg		R		R		R		R		R		R		R	0.001	U
Chlorobenzene	0.051	mg/kg		R		R		R		R		R		R		R	0.001	U
Chloroethane	NC	mg/kg		R		R		R		R		R		R		R	0.002	U
Chloroform	0.0048	mg/kg		R		R		R		R		R		R		R	0.001	U
Chloromethane	NC	mg/kg		R		R		R		R		R		R		R	0.001	U
cis-1,2-Dichloroethene	0.0052	mg/kg		R		R		R		R		R		R		R	0.001	U
cis-1,3-Dichloropropene	0.000069 [1/]	mg/kg		R		R		R		R		R		R		R	0.00051	U
Hexachlorobutadiene	0.000011	mg/kg		R		R		R		R		R		R		R	0.0041	U
Methylene chloride	0.0015	mg/kg		R		R		R		R		R		R		R	0.002	U
Tetrachloroethene	0.0013	mg/kg		R		R		R		R		R		R		R	0.001	U
trans-1,2-Dichloroethene	0.023 [2/]	mg/kg		R		R		R		R		R		R		R	0.001	U
trans-1,3-Dichloropropene	0.000069 [1/]	mg/kg		R		R		R		R		R		R		R	0.00051	U
Trichloroethene	0.00011	mg/kg		R		R		R		R		R		R		R	0.001	U
Vinyl chloride	0.0000062	mg/kg		R		R		R		R		R		R		R	0.001	U

Table F-1. Soil Sampling Analytical Data

Location ID			SB-13		SB-13		SB-13		SB-13		SB-14		SB-14		SB-14		SB-14	
Sample Depth (bgs)			5 ft		10 ft		15 ft		20 ft		0.5 ft		5 ft		10 ft		15 ft	
Sample Collection Date			28-Jun-2022		28-Jun-2022		28-Jun-2022		28-Jun-2022		30-Jun-2022		30-Jun-2022		30-Jun-2022		30-Jun-2022	
Analyte	Project Action Level	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
1,1,1,2-Tetrachloroethane	0.00063	mg/kg	0.0011	U	0.0011	U	0.0012	U	0.0011	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U
1,1,1-Trichloroethane	0.084	mg/kg	0.0011	U	0.0011	U	0.0012	U	0.0011	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U
1,1,2,2-Tetrachloroethane	0.000037	mg/kg	0.00056	U	0.00053	U	0.00059	U	0.00053	U	0.00069	U	0.00067	U	0.00058	U	0.00054	U
1,1,2-Trichloroethane	0.00013	mg/kg	0.0011	U	0.0011	U	0.0012	U	0.0011	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U
1,1-Dichloroethane	0.0026	mg/kg	0.0011	U	0.0011	U	0.0012	U	0.0011	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U
1,1-Dichloroethene	0.0025	mg/kg	0.0011	U	0.0011	U	0.0012	U	0.0011	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U
1,1-Dichloropropene	NC	mg/kg	0.0011	UJ	0.0011	UJ	0.0012	UJ	0.0011	UJ	0.0014	U	0.0013	U	0.0012	U	0.0011	U
1,2,3-Trichlorobenzene	0.011	mg/kg	0.0045	UJ	0.0042	U	0.0047	U	0.0043	U	0.0055	U	0.0053	U	0.0047	U	0.0043	U
1,2,3-Trichloropropane	0.00000015	mg/kg	0.0011	U	0.0011	U	0.0012	U	0.0011	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U
1,2,4-Trichlorobenzene	0.000070	mg/kg	0.0045	UJ	0.0042	U	0.0047	U	0.0043	U	0.0055	U	0.0053	U	0.0047	U	0.0043	U
1,2-Dichlorobenzene	0.40	mg/kg	0.0011	U	0.0011	U	0.0012	U	0.0011	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U
1,2-Dichloroethane	0.0016	mg/kg	0.0011	U	0.0011	U	0.0012	U	0.0011	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U
1,2-Dichloropropane	0.00024	mg/kg	0.0011	UJ	0.0011	UJ	0.0012	UJ	0.0011	UJ	0.0014	U	0.0013	U	0.0012	U	0.0011	U
1,3-Dichlorobenzene	0.0013	mg/kg	0.0011	U	0.0011	U	0.0012	U	0.0011	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U
1,3-Dichloropropane	0.057	mg/kg	0.00056	U	0.00053	U	0.00059	U	0.00053	U	0.00069	U	0.00067	U	0.00058	U	0.00054	U
1,4-Dichlorobenzene	0.068	mg/kg	0.00056	U	0.00053	U	0.00059	U	0.00053	U	0.00069	U	0.00067	U	0.00058	U	0.00054	U
2,2-Dichloropropane	NC	mg/kg	0.0011	U	0.0011	U	0.0012	U	0.0011	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U
2-Chlorotoluene	0.11	mg/kg	0.00056	U	0.00053	U	0.00059	U	0.00053	U	0.00069	U	0.00067	U	0.00058	U	0.00054	U
4-Chlorotoluene	NC	mg/kg	0.00056	U	0.00053	U	0.00059	U	0.00053	U	0.00069	U	0.00067	U	0.00058	U	0.00054	U
Carbon tetrachloride	0.000088	mg/kg	0.0011	U	0.0011	U	0.0012	U	0.0011	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U
Chlorobenzene	0.051	mg/kg	0.0011	U	0.0011	U	0.0012	U	0.0011	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U
Chloroethane	NC	mg/kg	0.0022	U	0.0021	U	0.0023	U	0.0021	U	0.0027	U	0.0027	U	0.0023	U	0.0022	U
Chloroform	0.0048	mg/kg	0.0011	U	0.0011	U	0.0012	U	0.0011	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U
Chloromethane	NC	mg/kg	0.0011	U	0.0011	U	0.0012	U	0.0011	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U
cis-1,2-Dichloroethene	0.0052	mg/kg	0.0011	U	0.0011	U	**0.0083**		0.0024	J	0.0014	U	0.0013	U	0.0013	J	**0.0063**	
cis-1,3-Dichloropropene	0.000069 [1/]	mg/kg	0.00056	U	0.00053	U	0.00059	U	0.00053	U	0.00069	U	0.00067	U	0.00058	U	0.00054	U
Hexachlorobutadiene	0.000011	mg/kg	0.0045	U	0.0042	U	0.0047	U	0.0043	U	0.0055	U	0.0053	U	0.0047	U	0.0043	U
Methylene chloride	0.0015	mg/kg	0.0022	U	0.0021	U	0.0023	U	0.0021	U	0.0027	U	0.0027	U	0.0023	U	0.0022	U
Tetrachloroethene	0.0013	mg/kg	0.0011	U	0.0011	U	0.0012	U	0.0011	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U
trans-1,2-Dichloroethene	0.023 [2/]	mg/kg	0.0011	U	0.0011	U	0.00052	J	0.0011	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U
trans-1,3-Dichloropropene	0.000069 [1/]	mg/kg	0.00056	U	0.00053	U	0.00059	U	0.00053	U	0.00069	U	0.00067	U	0.00058	U	0.00054	U
Trichloroethene	0.00011	mg/kg	0.0011	U	0.0011	U	**0.013**		0.0011	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U
Vinyl chloride	0.0000062	mg/kg	0.0011	U	0.0011	U	**0.00062**	J	**0.00091**	J	0.0014	U	0.0013	U	0.0012	U	0.0011	U

Table F-1. Soil Sampling Analytical Data

Location ID Sample Depth (bgs) Sample Collection Date			SB-14 20 ft 30-Jun-2022		SB-15 0.5 ft 1-Jul-2022		SB-15 0.5 ft (DUP) 1-Jul-2022		SB-15 5 ft 1-Jul-2022		SB-15 10 ft 1-Jul-2022		SB-15 15 ft 1-Jul-2022		SB-15 20 ft 1-Jul-2022		SB-16 0.5 ft 1-Jul-2022	
Analyte	Project Action Level	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
1,1,1,2-Tetrachloroethane	0.00063	mg/kg	0.0012	U	0.0015	U	0.0013	U	0.0012	U	0.0014	U	0.00099	U	0.0012	U	0.0011	U
1,1,1-Trichloroethane	0.084	mg/kg	0.0012	U	0.0015	U	0.0013	U	0.0012	U	0.0014	U	0.00099	U	0.0012	U	0.0011	U
1,1,2,2-Tetrachloroethane	0.000037	mg/kg	0.0006	U	0.00075	U	0.00064	U	0.00062	U	0.00072	U	0.0005	U	0.00058	U	0.00053	U
1,1,2-Trichloroethane	0.00013	mg/kg	0.0012	U	0.0015	U	0.0013	U	0.0012	U	0.0014	U	0.00099	U	0.0012	U	0.0011	U
1,1-Dichloroethane	0.0026	mg/kg	0.0012	U	0.0015	U	0.0013	U	0.0012	U	0.0014	U	0.00099	U	0.0012	U	0.0011	U
1,1-Dichloroethene	0.0025	mg/kg	0.00051	J	0.0015	U	0.0013	U	0.0012	U	0.0014	U	0.00099	U	0.0012	U	0.0011	U
1,1-Dichloropropene	NC	mg/kg	0.0012	U	0.0015	U	0.0013	U	0.0012	U	0.0014	U	0.00099	U	0.0012	U	0.0011	U
1,2,3-Trichlorobenzene	0.011	mg/kg	0.0048	U	0.006	U	0.0051	U	0.005	U	0.0057	U	0.004	U	0.0046	U	0.0042	U
1,2,3-Trichloropropane	0.00000015	mg/kg	0.0012	U	0.0015	U	0.0013	U	0.0012	U	0.0014	U	0.00099	U	0.0012	U	0.0011	U
1,2,4-Trichlorobenzene	0.000070	mg/kg	0.0048	U	0.006	U	0.0051	U	0.005	U	0.0057	U	0.004	U	0.0046	U	0.0042	U
1,2-Dichlorobenzene	0.40	mg/kg	0.0012	U	0.0015	U	0.0013	U	0.0012	U	0.0014	U	0.00099	U	0.0012	U	0.0011	U
1,2-Dichloroethane	0.0016	mg/kg	0.0012	U	0.0015	U	0.0013	U	0.0012	U	0.0014	U	0.00099	U	0.0012	U	0.0011	U
1,2-Dichloropropane	0.00024	mg/kg	0.0012	U	0.0015	U	0.0013	U	0.0012	U	0.0014	U	0.00099	U	0.0012	U	0.0011	U
1,3-Dichlorobenzene	0.0013	mg/kg	0.0012	U	0.0015	U	0.0013	U	0.0012	U	0.0014	U	0.00099	U	0.0012	U	0.0011	U
1,3-Dichloropropane	0.057	mg/kg	0.0006	U	0.00075	U	0.00064	U	0.00062	U	0.00072	U	0.0005	U	0.00058	U	0.00053	U
1,4-Dichlorobenzene	0.068	mg/kg	0.0006	U	0.00075	U	0.00064	U	0.00062	U	0.00072	U	0.0005	U	0.00058	U	0.00053	U
2,2-Dichloropropane	NC	mg/kg	0.0012	U	0.0015	U	0.0013	U	0.0012	U	0.0014	U	0.00099	U	0.0012	U	0.0011	U
2-Chlorotoluene	0.11	mg/kg	0.0006	U	0.00075	U	0.00064	U	0.00062	U	0.00072	U	0.0005	U	0.00058	U	0.00053	U
4-Chlorotoluene	NC	mg/kg	0.0006	U	0.00075	U	0.00064	U	0.00062	U	0.00072	U	0.0005	U	0.00058	U	0.00053	U
Carbon tetrachloride	0.000088	mg/kg	0.0012	U	0.0015	U	0.0013	U	0.0012	U	0.0014	U	0.00099	U	0.0012	U	0.0011	U
Chlorobenzene	0.051	mg/kg	0.0012	U	0.0015	U	0.0013	U	0.0012	U	0.0014	U	0.00099	U	0.0012	U	0.0011	U
Chloroethane	NC	mg/kg	0.0024	U	0.003	U	0.0026	U	0.0025	U	0.0029	U	0.002	U	0.0023	U	0.0021	U
Chloroform	0.0048	mg/kg	0.0012	U	0.0015	U	0.0013	U	0.0012	U	0.0014	U	0.00099	U	0.0012	U	0.0011	U
Chloromethane	NC	mg/kg	0.0012	U	0.0015	U	0.0013	U	0.0012	U	0.0014	U	0.00099	U	0.0012	U	0.0011	U
cis-1,2-Dichloroethene	0.0052	mg/kg	**0.071**		0.0015	U	0.0013	U	0.0012	U	0.0014	U	0.00099	U	0.0012	U	0.0011	U
cis-1,3-Dichloropropene	0.000069 [1/]	mg/kg	0.0006	U	0.00075	U	0.00064	U	0.00062	U	0.00072	U	0.0005	U	0.00058	U	0.00053	U
Hexachlorobutadiene	0.000011	mg/kg	0.0048	U	0.006	U	0.0051	U	0.005	U	0.0057	U	0.004	U	0.0046	U	0.0042	U
Methylene chloride	0.0015	mg/kg	0.0024	U	0.003	U	0.0026	U	0.0025	U	0.0029	U	0.002	U	0.0023	U	0.0021	U
Tetrachloroethene	0.0013	mg/kg	0.0012	U	0.0015	U	0.0013	U	0.0012	U	0.0014	U	0.00099	U	0.0012	U	0.0011	U
trans-1,2-Dichloroethene	0.023 [2/]	mg/kg	0.0012	U	0.0015	U	0.0013	U	0.0012	U	0.0014	U	0.00099	U	0.0012	U	0.0011	U
trans-1,3-Dichloropropene	0.000069 [1/]	mg/kg	0.0006	U	0.00075	U	0.00064	U	0.00062	U	0.00072	U	0.0005	U	0.00058	U	0.00053	U
Trichloroethene	0.00011	mg/kg	0.0012	U	0.0015	U	0.0013	U	0.0012	U	0.0014	U	0.00099	U	0.0012	U	0.0011	U
Vinyl chloride	0.0000062	mg/kg	**0.00099**	J	0.0015	U	0.0013	U	0.0012	U	0.0014	U	0.00099	U	0.0012	U	0.0011	U

Table F-1. Soil Sampling Analytical Data

Location ID Sample Depth (bgs) Sample Collection Date			SB-16 5 ft 1-Jul-2022		SB-16 10 ft 1-Jul-2022		SB-16 15 ft 1-Jul-2022		SB-16 20 ft 1-Jul-2022		SB-17 0.5 ft 27-Jun-2022		SB-17 10 ft 27-Jun-2022		SB-17 10 ft (DUP) 27-Jun-2022		SB-17 20 ft 27-Jun-2022	
Analyte	Project Action Level	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
1,1,1,2-Tetrachloroethane	0.00063	mg/kg	0.001	U	0.0011	U	0.0012	U	0.0013	U		R		R		R		R
1,1,1-Trichloroethane	0.084	mg/kg	0.001	U	0.0011	U	0.0012	U	0.0013	U		R		R		R		R
1,1,2,2-Tetrachloroethane	0.000037	mg/kg	0.00052	U	0.00053	U	0.00059	U	0.00064	U		R		R		R		R
1,1,2-Trichloroethane	0.00013	mg/kg	0.001	U	0.0011	U	0.0012	U	0.0013	U		R		R		R		R
1,1-Dichloroethane	0.0026	mg/kg	0.001	U	0.0011	U	0.0012	U	0.0013	U		R		R		R		R
1,1-Dichloroethene	0.0025	mg/kg	0.001	U	0.0011	U	0.0012	U	0.0013	U		R		R		R		R
1,1-Dichloropropene	NC	mg/kg	0.001	U	0.0011	U	0.0012	U	0.0013	U		R		R		R		R
1,2,3-Trichlorobenzene	0.011	mg/kg	0.0042	U	0.0043	U	0.0048	U	0.0051	U		R		R		R		R
1,2,3-Trichloropropane	0.00000015	mg/kg	0.001	U	0.0011	U	0.0012	U	0.0013	U		R		R		R		R
1,2,4-Trichlorobenzene	0.000070	mg/kg	0.0042	U	0.0043	U	0.0048	U	0.0051	U		R		R		R		R
1,2-Dichlorobenzene	0.40	mg/kg	0.001	U	0.0011	U	0.0012	U	0.0013	U		R		R		R		R
1,2-Dichloroethane	0.0016	mg/kg	0.001	U	0.0011	U	0.0012	U	0.0013	U		R		R		R		R
1,2-Dichloropropane	0.00024	mg/kg	0.001	U	0.0011	U	0.0012	U	0.0013	U		R		R		R		R
1,3-Dichlorobenzene	0.0013	mg/kg	0.001	U	0.0011	U	0.0012	U	0.0013	U		R		R		R		R
1,3-Dichloropropane	0.057	mg/kg	0.00052	U	0.00053	U	0.00059	U	0.00064	U		R		R		R		R
1,4-Dichlorobenzene	0.068	mg/kg	0.00052	U	0.00053	U	0.00059	U	0.00064	U		R		R		R		R
2,2-Dichloropropane	NC	mg/kg	0.001	U	0.0011	U	0.0012	U	0.0013	U		R		R		R		R
2-Chlorotoluene	0.11	mg/kg	0.00052	U	0.00053	U	0.00059	U	0.00064	U		R		R		R		R
4-Chlorotoluene	NC	mg/kg	0.00052	U	0.00053	U	0.00059	U	0.00064	U		R		R		R		R
Carbon tetrachloride	0.000088	mg/kg	0.001	U	0.0011	U	0.0012	U	0.0013	U		R		R		R		R
Chlorobenzene	0.051	mg/kg	0.001	U	0.0011	U	0.0012	U	0.0013	U		R		R		R		R
Chloroethane	NC	mg/kg	0.0021	U	0.0021	U	0.0024	U	0.0026	U		R		R		R		R
Chloroform	0.0048	mg/kg	0.001	U	0.0011	U	0.0012	U	0.0013	U		R		R		R		R
Chloromethane	NC	mg/kg	0.001	U	0.0011	U	0.0012	U	0.0013	U		R		R		R		R
cis-1,2-Dichloroethene	0.0052	mg/kg	0.001	U	0.0011	U	0.0012	U	0.0013	U		R		R	0.0011	J		R
cis-1,3-Dichloropropene	0.000069 [1/]	mg/kg	0.00052	U	0.00053	U	0.00059	U	0.00064	U		R		R		R		R
Hexachlorobutadiene	0.000011	mg/kg	0.0042	U	0.0043	U	0.0048	U	0.0051	U		R		R		R		R
Methylene chloride	0.0015	mg/kg	0.0021	U	0.0021	U	0.0024	U	0.0026	U		R		R		R		R
Tetrachloroethene	0.0013	mg/kg	0.001	U	0.0011	U	0.0012	U	0.0013	U		R		R		R		R
trans-1,2-Dichloroethene	0.023 [2/]	mg/kg	0.001	U	0.0011	U	0.0012	U	0.0013	U		R		R		R		R
trans-1,3-Dichloropropene	0.000069 [1/]	mg/kg	0.00052	U	0.00053	U	0.00059	U	0.00064	U		R		R		R		R
Trichloroethene	0.00011	mg/kg	0.001	U	0.0011	U	0.0012	U	0.0013	U		R	**0.13**	J	**0.17**	J	**0.50**	J
Vinyl chloride	0.0000062	mg/kg	0.001	U	0.0011	U	0.0012	U	0.0013	U		R		R		R		R

Table F-1. Soil Sampling Analytical Data

Location ID			SB-18		SB-18		SB-18		SB-19		SB-19		SB-19		SB-19		SB-19	
Sample Depth (bgs)			0.5 ft		10 ft		20 ft		0.5 ft		5 ft		10 ft		15 ft		20 ft	
Sample Collection Date			28-Jun-2022		28-Jun-2022		28-Jun-2022		1-Jul-2022		1-Jul-2022		1-Jul-2022		1-Jul-2022		1-Jul-2022	
Analyte	Project Action Level	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
1,1,1,2-Tetrachloroethane	0.00063	mg/kg		R		R		R	0.0022	U	0.0022	U	0.40	U	0.00098	U	0.001	U
1,1,1-Trichloroethane	0.084	mg/kg		R		R		R	0.0022	U	0.0022	U	0.20	U	0.00098	U	0.001	U
1,1,2,2-Tetrachloroethane	0.000037	mg/kg		R		R		R	0.0011	U	0.0011	U	0.10	U	0.00049	U	0.0005	U
1,1,2-Trichloroethane	0.00013	mg/kg		R		R		R	0.0022	U	0.0022	U	0.20	U	0.00098	U	0.001	U
1,1-Dichloroethane	0.0026	mg/kg		R		R		R	0.0022	U	0.0022	U	0.20	U	0.00098	U	0.001	U
1,1-Dichloroethene	0.0025	mg/kg		R		R		R	0.0022	U	0.0022	U	0.20	U	0.00098	U	0.001	U
1,1-Dichloropropene	NC	mg/kg		R		R		R	0.0022	U	0.0022	U	0.20	U	0.00098	U	0.001	U
1,2,3-Trichlorobenzene	0.011	mg/kg		R		R		R	0.0089	U	0.0087	U	0.80	U	0.0039	U	0.004	U
1,2,3-Trichloropropane	0.00000015	mg/kg		R		R		R	0.0022	U	0.0022	U	0.20	U	0.00098	U	0.001	U
1,2,4-Trichlorobenzene	0.000070	mg/kg		R		R		R	0.0089	U	0.0087	U	0.80	U	0.0039	U	0.004	U
1,2-Dichlorobenzene	0.40	mg/kg		R		R		R	0.0022	U	0.0022	U	0.20	U	0.00098	U	0.001	U
1,2-Dichloroethane	0.0016	mg/kg		R		R		R	0.0022	U	0.0022	U	0.20	U	0.00098	U	0.001	U
1,2-Dichloropropane	0.00024	mg/kg		R		R		R	0.0022	U	0.0022	U	0.20	U	0.00098	U	0.001	U
1,3-Dichlorobenzene	0.0013	mg/kg		R		R		R	0.0022	U	0.0022	U	0.20	U	0.00098	U	0.001	U
1,3-Dichloropropane	0.057	mg/kg		R		R		R	0.0011	U	0.0011	U	0.10	U	0.00049	U	0.0005	U
1,4-Dichlorobenzene	0.068	mg/kg		R		R		R	0.0011	U	0.0011	U	0.10	U	0.00049	U	0.0005	U
2,2-Dichloropropane	NC	mg/kg		R		R		R	0.0022	U	0.0022	U	0.20	U	0.00098	U	0.001	U
2-Chlorotoluene	0.11	mg/kg		R		R		R	0.0011	U	0.0011	U	0.10	U	0.00049	U	0.0005	U
4-Chlorotoluene	NC	mg/kg		R		R		R	0.0011	U	0.0011	U	0.10	U	0.00049	U	0.0005	U
Carbon tetrachloride	0.000088	mg/kg		R		R		R	0.0022	U	0.0022	U	0.40	U	0.00098	U	0.001	U
Chlorobenzene	0.051	mg/kg		R		R		R	0.0022	U	0.0022	U	0.20	U	0.00098	U	0.001	U
Chloroethane	NC	mg/kg		R		R		R	0.0045	U	0.0044	U	0.40	UJ	0.002	U	0.002	U
Chloroform	0.0048	mg/kg		R		R		R	0.0022	U	0.0022	U	0.20	U	0.00098	U	0.001	U
Chloromethane	NC	mg/kg		R		R		R	0.0022	U	0.0022	U	0.20	U	0.00098	U	0.001	U
cis-1,2-Dichloroethene	0.0052	mg/kg		R		R		R	0.0022	U	0.0022	U	0.20	U	0.00098	U	0.001	U
cis-1,3-Dichloropropene	0.000069 [1/]	mg/kg		R		R		R	0.0011	U	0.0011	U	0.10	U	0.00049	U	0.0005	U
Hexachlorobutadiene	0.000011	mg/kg		R		R		R	0.0089	U	0.0087	U	0.80	U	0.0039	U	0.004	U
Methylene chloride	0.0015	mg/kg		R		R		R	0.0045	U	0.0044	U	0.40	U	0.002	U	0.002	U
Tetrachloroethene	0.0013	mg/kg		R		R		R	0.0022	U	0.0022	U	0.20	U	0.00098	U	0.001	U
trans-1,2-Dichloroethene	0.023 [2/]	mg/kg		R		R		R	0.0022	U	0.0022	U	0.20	U	0.00098	U	0.001	U
trans-1,3-Dichloropropene	0.000069 [1/]	mg/kg		R		R		R	0.0011	U	0.0011	U	0.10	U	0.00049	U	0.0005	U
Trichloroethene	0.00011	mg/kg		R		R		R	0.0022	U	0.0022	U	0.20	U	0.00098	U	0.001	U
Vinyl chloride	0.0000062	mg/kg		R		R		R	0.0022	U	0.0022	U	0.20	U	**0.00081**	J	**0.00048**	J

Table F-1. Soil Sampling Analytical Data

Notes:

Detected results exceeding the Project Action Level are boldfaced and shaded grey.
Limits of detection for non-detected results exceeding the Project Action Level are shaded grey.

[1/] The screening level is for 1,3-dichloropropene (total) but will be applied to the cis- and trans- isomers.

[2/] The screening level is for 1,2-dichloroethene (mixed isomers) is slightly lower than the value for the trans- isomer (0.032 mg/kg) and is listed in this table.

bgs = below ground surface
DUP = field duplicate
ft = feet
mg/kg = milligrams per kilogram
NC = no criterion
Q = qualifier

Data Qualifiers:

J = The reported result is an estimated value.
R = The result is rejected.
U = The analyte is not detected at the associated numerical value.
UJ = The analyte is not detected; the associated numerical value is approximate.

Table F-2. Groundwater Elevation and Field Parameter Measurements

Well ID	Date	Top of Well Casing Elevation (feet-MLLW)	Depth to Top of Screen (feet-BTOC)	Depth to Groundwater (feet-BTOC)	Groundwater Elevation (feet-MLLW)	pH (s.u.)	Specific Conductance (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (ºC)	Salinity (ppt)	ORP (mV)
2MW-9	7/11/2022	21.41	25.0	6.73	14.68	7.18	0.280	29.84	0.49	12.6	0.13	-499.6
2MW-10	7/11/2022	22.63	30.0	7.70	14.93	7.60	0.292	70.89	0.58	13.4	0.14	-501.8
2MW-11	7/8/2022	22.81	10.0	6.54	16.27	6.43	0.289	6.39	0.50	13.8	0.14	8.1
2MW-12	7/8/2022	23.13	10.0	5.70	17.43	6.53	0.647	15.12	0.40	15.4	0.32	-325.9
2MW-13	7/11/2022	22.13	10.0	6.43	15.7	6.37	0.941	4.78	0.62	13.2	0.47	77.4
2MW-14	7/11/2022	23.75	10.0	8.60	15.15	6.45	0.862	8.62	0.54	13.4	0.43	-354.3
2MW-15	7/11/2022	23.84	8.0	6.65	17.19	6.48	0.376	3.14	0.76	11.7	0.18	42.4
2MW-16	7/11/2022	23.00	8.0	6.30	16.70	6.45	0.360	66.87	0.63	12.1	0.17	36.3
2MW-17	7/8/2022	24.40	10.0	2.39	22.01	6.91	0.419	32.80	0.56	13.9	0.20	-389.8
2MW-18	7/8/2022	24.93	8.0	5.28	19.65	6.91	0.214	23.43	0.76	14.6	0.10	-248.6
2MW-19	7/11/2022	22.16	8.0	8.30	13.86	6.45	0.519	21.32	4.60	12.6	0.25	131.5

Notes:
BTOC = below top of casing
°C = degrees Celsius
mg/L = milligram(s) per liter
MLLW = mean low lower water
mS/cm = milliSiemens(s) per centimeter
mV = millivolt(s)
NTU = nephelometric turbidity units
ORP = oxidation/reduction potential
pH = potentiometric hydrogen ion concentration
ppt = parts per trillion
s.u. = standard units

Table F-3. Groundwater Sampling Analytical Data

Location ID / Sample Collection Date / Analyte	Project Action Level	Units	2MW-9 7/11/2022	2MW-9 (DUP) 7/11/2022	2MW-10 7/11/2022	2MW-11 7/8/2022	2MW-12 7/8/2022	2MW-13 7/11/2022	2MW-14 7/11/2022	2MW-15 7/11/2022	2MW-16 7/11/2022	2MW-17 7/8/2022	2MW-18 7/8/2022	2MW-18 (DUP) 7/8/2022	2MW-19 7/11/2022
1,1,1,2-Tetrachloroethane	1.7	µg/L	0.15 U	0.15 U	0.15 U	0.15 U	1.5 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
1,1,1-Trichloroethane	200	µg/L	0.070 U	0.070 U	0.070 U	0.070 U	0.7 U	0.070 U	0.070 U	0.070 U	0.070 U	0.070 U	0.070 U	0.070 U	0.070 U
1,1,2,2-Tetrachloroethane	0.10	µg/L	0.15 U	0.15 U	0.15 U	0.15 U	1.5 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
1,1,2-Trichloroethane	0.35	µg/L	0.15 U	0.15 U	0.15 U	0.15 U	1.5 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
1,1-Dichloroethane	7.7	µg/L	0.070 U	0.070 U	0.070 U	0.078 J	0.7 U	0.028 J	0.044 J	0.070 U	0.070 U	0.070 U	0.070 U	0.070 U	0.070 U
1,1-Dichloroethene	7.0	µg/L	0.070 U	0.070 U	0.070 U	0.096 J	0.7 U	0.070 U	0.098 J	0.070 U	0.070 U	0.27	0.070 U	0.070 U	0.070 U
1,1-Dichloropropene	NC	µg/L	0.15 U	0.15 U	0.15 U	0.15 U	1.5 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
1,2,3-Trichlorobenzene	6.4	µg/L	0.35 UJ	0.35 UJ	0.35 UJ	0.35 UJ	3.5 UJ	0.35 UJ	0.35 UJ	0.35 UJ	0.35 U	0.35 UJ	0.35 U J	0.35 U J	0.35 UJ
1,2,3-Trichloropropane	0.00038	µg/L	0.15 U	0.15 U	0.15 U	0.15 U	1.5 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
1,2,4-Trichlorobenzene	0.036	µg/L	0.35 U	0.35 U	0.35 U	0.35 U	3.5 U	0.35 UJ	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
1,2-Dichlorobenzene	600	µg/L	0.15 U	0.15 U	0.15 U	0.15 U	1.5 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
1,2-Dichloroethane	0.48	µg/L	0.15 U	0.15 U	0.15 U	0.15 U	1.5 U	0.15 U	0.044 J	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
1,2-Dichloropropane	0.71	µg/L	0.15 U	0.15 U	0.15 U	0.15 U	1.5 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
1,3-Dichlorobenzene	2.0	µg/L	0.18 J	0.16 J	0.065 J	0.15 J	1.5 U	0.12 J	0.13 J	0.082 J	0.068 J	0.18 J	0.14 J	0.15 J	0.21 J
1,3-Dichloropropane	160	µg/L	0.070 U	0.070 U	0.070 U	0.070 U	0.7 U	0.070 U	0.070 U	0.070 U	0.070 U	0.070 U	0.070 U	0.070 U	0.070 U
1,4-Dichlorobenzene	8.1	µg/L	0.15 U	0.15 U	0.15 U	0.15 U	1.5 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
2,2-Dichloropropane	NC	µg/L	0.15 U	0.15 U	0.15 U	0.15 U	1.5 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
2-Chlorotoluene	160	µg/L	0.35 U	0.35 U	0.35 U	0.35 U	3.5 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
4-Chlorotoluene	NC	µg/L	0.25 U	0.25 U	0.25 U	0.25 U	2.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Carbon tetrachloride	0.20	µg/L	0.070 U	0.070 U	0.070 U	0.070 U	0.7 U	0.070 U	0.070 U	0.070 U	0.070 U	0.070 U	0.070 U	0.070 U	0.070 U
Chlorobenzene	100	µg/L	0.15 U	0.15 U	0.15 U	0.15 U	1.5 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
Chloroethane	NC	µg/L	0.25 U	0.25 U	0.25 U	0.53	2.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Chloroform	1.4	µg/L	0.22	0.18 J	0.47	0.070 U	0.7 U	0.070 U	**1.9**	0.6	0.22	0.070 U	0.070 U	0.070 U	0.93
Chloromethane	NC	µg/L	0.35 U	0.35 U	0.35 U	0.35 U	3.5 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
cis-1,2-Dichloroethene	16	µg/L	0.15 U	0.15 U	0.15 U	10	1.2 J	1.3	13	0.15 U	0.15 U	1.9	0.071 J	0.083 J	0.15 U
cis-1,3-Dichloropropene	0.22 [1]	µg/L	0.15 U	0.15 U	0.15 U	0.15 U	1.5 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
Hexachlorobutadiene	0.010	µg/L	0.15 U	0.15 U	0.15 U	0.15 U	1.5 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
Methylene chloride	5.0	µg/L	3.5 U	3.5 U	3.5 U	3.5 U	35 U	3.5 UJ	3.5 U	3.5 U	3.5 UJ	3.5 U	3.5 U	3.5 U	3.5 U
Tetrachloroethene	2.4	µg/L	0.25 U	0.25 U	0.25 U	0.25 U	2.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
trans-1,2-Dichloroethene	100	µg/L	0.070 U	0.070 U	0.070 U	0.095 J	0.41 J	0.039 J	0.048 J	0.070 U	0.070 U	0.18 J	0.070 U	0.070 U	0.070 U
trans-1,3-Dichloropropene	0.22 [1]	µg/L	0.15 U	0.15 U	0.15 U	0.15 U	1.5 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
Trichloroethene	0.30 [2]	µg/L	0.15 U	0.15 U	0.15 U	**4.7**	**7.6**	**0.40**	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U J	0.24 J	0.15 U
Vinyl chloride	0.020 [3]	µg/L	0.015 U	0.015 U	0.015 U	**2.0**	**0.7**	**0.090**	**0.47** J	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	**0.34**

Table F-3. Groundwater Sampling Analytical Data

Notes:

Detected results exceeding the Project Action Level are boldfaced and shaded grey.

Limits of detection for non-detected results exceeding the Project Action Level are shaded grey.

[1/] The project action level is for 1,3-dichloropropene (total) but will be applied to the cis- and trans-isomers.

[2/] The remediation goal for trichloroethene is 5.0 µg/L.

[3/] The remediation goal for vinyl chloride is 0.029 µg/L.

µg/L = micrograms per liter

DUP = field duplicate

NC = no criterion

Q = qualifier

Data Qualifiers:

J = The reported result is an estimated value.

U = The analyte is not detected at the associated numerical value.

UJ = The analyte is not detected; the associated numerical value is approximate.

Table F-4. Groundwater Elevation and Field Parameter Measurements

Well ID	Date	Top of Well Casing Elevation (feet-MLLW)	Depth to Top of Screen (feet-BTOC)	Depth to Groundwater (feet-BTOC)	Groundwater Elevation (feet-MLLW)	pH (s.u.)	Specific Conductance (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (ºC)	Salinity (ppth)	ORP (mV)
2MW-1	15 June 2023	23.10	3.0	4.12	18.98	5.87	0.203	7.52	3.33	10.6	0.10	51.7
2MW-6	26 April 2023	18.32	8.0	5.96	12.36	6.44	0.632	2.36	1.08	10.1	0.31	158.4
2MW-8	26 April 2023	18.89	7.0	2.95	15.94	6.50	0.847	3.06	4.78	10.3	0.42	68.5
2MW-9	26 April 2023	21.41	25.0	5.87	15.54	6.68	0.233	3.90	1.24	11.7	0.11	-19.4
2MW-10	26 April 2023	22.63	30.0	6.78	15.85	7.07	0.248	4.39	1.65	11.7	0.12	-38.9
2MW-11	25 April 2023	22.81	10.0	5.47	17.34	6.22	0.389	6.49	1.07	11.3	0.19	14.8
2MW-12	25 April 2023	23.13	10.0	4.59	18.54	6.33	0.793	16.95	0.99	12.4	0.39	-21.4
2MW-13	25 April 2023	22.13	10.0	5.23	16.90	6.27	0.991	5.72	1.09	11.3	0.49	52.7
2MW-14	26 April 2023	23.75	10.0	7.42	16.33	6.32	0.839	221.53	1.10	10.9	0.41	161.7
2MW-15	25 April 2023	23.84	8.0	5.45	18.39	6.27	0.335	152.11	1.09	10.2	0.16	30.8
2MW-16	25 April 2023	23.00	8.0	5.02	17.98	6.24	0.298	23.69	1.54	9.5	0.14	54.7
2MW-17	25 April 2023	24.40	10.0	1.01	23.39	6.75	0.487	15.01	1.24	11.2	0.24	-0.3
2MW-18	25 April 2023	24.93	8.0	3.90	21.03	6.44	0.208	14.43	1.10	10.9	0.10	212.0
2MW-19	26 April 2023	22.16	8.0	7.08	15.08	5.91	0.299	33.70	1.29	10.2	0.14	192.3

Notes:
BTOC = below top of casing
°C = degrees Celsius
mg/L = milligram(s) per liter
MLLW = mean low lower water
mS/cm = milliSiemens(s) per centimeter
mV = millivolt(s)
NTU = nephelometric turbidity units
ORP = oxidation/reduction potential
pH = potentiometric hydrogen ion concentration
ppth = parts per thousand
s.u. = standard units

Table F-5. Groundwater Sampling Analytical Data

Location ID / Sample Collection Date / Analyte	Project Action Level	Units	MW2-8 25-Apr-2023	2MW-1 15-Jun-2023	2MW-6 26-Apr-2023	2MW-9 26-Apr-2023	2MW-10 26-Apr-2023	2MW-11 25-Apr-2023	2MW-11 (DUP) 25-Apr-2023	2MW-12 25-Apr-2023	2MW-13 25-Apr-2023
1,1,1,2-Tetrachloroethane	1.7	µg/L	0.10 UJ	0.10 U	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.50 UJ	0.10 UJ
1,1,2,2-Tetrachloroethane	0.10	µg/L	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.50 U	0.10 U
1,1,2-Trichloroethane	0.35	µg/L	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.50 U	0.10 U
1,1-Dichloroethene	7.0	µg/L	0.10 UJ	0.10 U	0.10 UJ	0.10 UJ	0.10 UJ	0.14 J	0.12 J	0.50 UJ	0.10 UJ
1,2-Dichloroethane	0.48	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.0 U	0.20 U
1,4-Dichlorobenzene	8.1	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.0 U	0.20 U
Chloroform	1.4	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.0 U	0.20 U
cis-1,3-Dichloropropene	0.22[1]	µg/L	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.50 U	0.10 U
Hexachlorobutadiene	0.010	µg/L	0.20 UJ	0.20 U	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ	2.5 UJ	0.20 UJ
Tetrachloroethene	2.4	µg/L	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.20 U	0.040 U
trans-1,3-Dichloropropene	0.22[1]	µg/L	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.50 U	0.10 U
Trichloroethene	0.30[2]	µg/L	0.022 J	**1.1**	0.025 J	0.040 U	0.040 U	**4.2**	**4.2**	**0.53** J	0.048 J
Vinyl chloride	0.020[3]	µg/L	0.012 UJ	0.012 U	0.012 UJ	0.012 UJ	0.014 J	**3.0** J	**2.8** J	**0.92** J	**0.029** J

Notes:

Detected results exceeding the Project Action Level are boldfaced and shaded grey.

Limits of detection for non-detected results exceeding the Project Action Level are shaded grey.

[1] The project action level is for 1,3-dichloropropene (total) but will be applied to the cis- and trans- isomers.

[2] The remediation goal for trichloroethene is 5.0 µg/L.

[3] The remediation goal for vinyl chloride is 0.029 µg/L.

µg/L = micrograms per liter

DUP = field duplicate

Data Qualifiers:

J = The reported result is an estimated value.

U = The analyte is not detected at the associated numerical value.

UJ = The analyte is not detected; the associated numerical value is approximate.

Table F-5. Groundwater Sampling Analytical Data

Location ID			2MW-13 (DUP)	2MW-14	2MW-15	2MW-16	2MW-17	2MW-18	2MW-19
Sample Collection Date			25-Apr-2023	26-Apr-2023	25-Apr-2023	25-Apr-2023	25-Apr-2023	25-Apr-2023	26-Apr-2023
Analyte	Project Action Level	Units							
1,1,1,2-Tetrachloroethane	1.7	µg/L	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ
1,1,2,2-Tetrachloroethane	0.10	µg/L	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
1,1,2-Trichloroethane	0.35	µg/L	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
1,1-Dichloroethene	7.0	µg/L	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.076 J	0.10 UJ	0.10 UJ
1,2-Dichloroethane	0.48	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
1,4-Dichlorobenzene	8.1	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Chloroform	1.4	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
cis-1,3-Dichloropropene	0.22[1]	µg/L	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Hexachlorobutadiene	0.010	µg/L	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ
Tetrachloroethene	2.4	µg/L	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U
trans-1,3-Dichloropropene	0.22[1]	µg/L	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Trichloroethene	0.30[2]	µg/L	0.048 J	0.026 J	0.040 U	0.11 J	**120** J	0.052 J	0.046 J
Vinyl chloride	0.020[3]	µg/L	**0.027** J	**0.055** J	0.012 UJ	0.012 UJ	**0.46** J	0.012 UJ	0.012 UJ

Notes:

Detected results exceeding the Project Action Level are boldfaced and shaded grey.

Limits of detection for non-detected results exceeding the Project Action Level are shaded grey.

[1] The project action level is for 1,3-dichloropropene (total) but will be applied to the cis- and trans- isomers.

[2] The remediation goal for trichloroethene is 5.0 µg/L.

[3] The remediation goal for vinyl chloride is 0.029 µg/L.

µg/L = micrograms per liter

DUP = field duplicate

Data Qualifiers:

J = The reported result is an estimated value.

U = The analyte is not detected at the associated numerical value.

UJ = The analyte is not detected; the associated numerical value is approximate.

Appendix G: OU 2 AREA 8 CUMULATIVE LONG-TERM MONITORING DATA

Table G-1. Summary of Selected VOCs Detected in Groundwater and Seeps at OU 2 Area 8 (1995-2019)

Location	Sampling Date	Analyte Concentration (µg/L)				
		1,1-DCE	cis-1,2-DCE	PCE	1,1,1-TCA	TCE
RG (Drinking Water)[a]		7[b]	70	5[b]	200	5[b]
RG (Surface Water)[a]		3.2[b,c]	--	8.9[b,c]	42,000	81[b,c]
MW8-8	11/95	1.0	2.0	49	23	190
	06/96	0.90 J	1.0	34	11	110
	09/96	1.0	2.0	58	19	190
	05/97	1.0 U	1.0	15	3.0	68
	10/97	0.60 U	1.0 U	19	9.0	78
	05/98	1.0 U	0.9 J	12	3.0	63
	10/98	1.0 U	1.0 U	30	9.0	76
	05/99	5.0 U *	5.0 U	5.0 U	5.0 U	58
	11/99	1.0	3.2	2.0	10	150 H
	06/00	1 J	4.5	23	6.6	120
	06/01	1.3	7.3	20	3.9	84
	06/02	1.1	7.3	17	3.9	81
	06/03	0.94	6.8	12	2.7	81 D
	06/04	1.1	8.5	13	2.9	80 D
	06/05	0.7	7.4	11	2.0	64
	06/06	0.68	7.6	9.2	2.2	68 D
	06/07	0.55	7.5	7.7	1.7	53 D
	05/08	0.41 J	6.6	8.4	1.6	59
	06/09	0.69	9.1	5.6	1.6	66
	06/10	0.55	8.4	5.1	1.5	58
	07/11	0.37 J	5.9	6.0	1.5	59
	06/12	0.14 J	2.1	9.7	1.1	38
	06/13	0.5 U	0.46 J	9.0	0.6	24 J
	06/14	0.5 U	0.83	9.8	0.83	32
	06/15	0.5 U	0.45 J	8.4	0.87	26
	06/16	0.11 J	1.2	6.9	0.9	37
	06/17	0.11 J	1.6	7.1	0.93	40
	09/18	0.13 J	1.8	8.0	NA	33 EJ
	06/19	0.20 UM	1.1	6.9	1.1	35
MW8-9	11/95	50 U *	27 J	50 U *	50 U	1600
	06/96	1.0 U	28	1 U	2.0	800
	09/96	1.0 U	28	0.40 J	2.0	1000
	05/97	1.0 U	34	0.30 J	2.0	1600
	10/97	1.0 U	1.0 U	1.0 U	1.0	720
	05/98	1.0 U	12	1.0 U	0.70 J	370
	10/98	1.0 U	34	1.0 U	3.0	610
	05/99	1.0 U	6.0	1.0 U	1.0 U	84
	11/99	0.50 U	30	0.6	1.4	500
	06/00	2.5 U	15	2.5 U	1 J	170
	06/01	0.24 U	18	0.26 J	0.44 J	330
	06/02	0.50 U	7.5	0.23 J	0.69	60
	06/03	0.50 U	1.3 U	0.50 U	0.23 J	21
	06/04	0.50 U	1.7	0.18 J	0.44 J	25
	06/05	0.2 U	0.2	0.2 U	0.2 U	4.1
	06/06	0.50 U	0.42 J	0.20 J	0.28 J	3.9
	06/07	0.5 U	0.27 J	0.5 U	0.15 J	1.9
	05/08	0.5 U	0.23 J	0.16 J	0.14 J	1.7
	06/09	0.2 U	1.3	0.18 J	0.14 J	20
	06/10	0.5 U	0.69	0.11 J	0.12 J	9.4
	07/11	0.5 U	0.8	0.12 J	0.11 J	12
	06/12	0.5 UJ	1.2	0.49 J	0.16 J	14
	06/13	0.5 U	2.7	0.18 J	0.13 J	43 J
	06/14	0.5 U	1.5	0.29 J	0.12 J	24
	06/15	0.5 U	0.35 J	0.16 J	0.13 J	5.6
	06/16	0.5 U	0.07 J	0.10 J	0.15 J	0.27 J
	06/17	0.5 U	0.5 U	0.13 J	0.50 U	0.12 J
	09/18	0.02 UJ	0.02 U	0.13	NA	0.059
	06/19	0.2 U	0.2 UM	0.10 J	0.090 J	0.20 U
MW8-10	06/00	0.54	1.8	1.2	4.2	22
	06/02	0.24 J	2.4	0.84	0.74	31

Table G-1. Summary of Selected VOCs Detected in Groundwater and Seeps at OU 2 Area 8 (1995-2019)

Location	Sampling Date	Analyte Concentration (µg/L)				
		1,1-DCE	cis-1,2-DCE	PCE	1,1,1-TCA	TCE
RG (Drinking Water)[a]		7[b]	70	5[b]	200	5[b]
RG (Surface Water)[a]		3.2[b,c]	--	8.9[b,c]	42,000	81[b,c]
MW8-11	11/95	**44**	1.0 U	1.0 U	**520**	**84**
	06/96	**47**	1.0 U	1.0 U	**460**	**84**
	09/96	**27**	0.30 J	1.0 U	**420**	**80**
	05/97	**42**	1.0 U	1.0 U	**500**	**63**
	10/97	**30**	2.0	1.0 U	**300**	**62**
	05/98	**33**	1.0 U	1.0 U	**200**	**61**
	10/98	**35**	1.0 U	1.0 U	**220**	**62**
	05/99	**8.0**	2.0 U	2.0 U	45	**27**
	11/99	**12**	0.50 U	0.50 U	64 H	**54 H**
	06/00	**12**	0.40 J	0.50 U	82 J	**41 J**
	06/01	**15**	0.38 J	0.27 J	91	**62**
	06/02	1.1	0.46 J	0.79	84	**92**
	06/03	**20**	0.47 J	0.6	80 D	**99 D**
	06/04	**25**	0.37 J	0.66	80	**110 D**
	06/05	**10**	0.2	0.5	33	**61**
	06/06	**10**	0.27 J	0.68	39	**99 D**
	06/07	3.3	0.29 J	0.81	21	**46 D**
	05/08	2.4	0.37 J	1.1	31	**53**
	06/09	1.6	0.38 J	1.2	22	**67**
	06/10	1.6	0.83	1.5	14	**80 J**
	07/11	0.35 J	0.82	0.79	10	**75**
	06/12	0.77 J	0.81	1.1	9.7	**56**
	06/13	0.56	0.61	1.0	6.9	**67**
	06/14	0.21 J	0.45 J	0.9	5.0	**55**
	06/15	0.2 J	0.55	0.77	6.3	**63**
	06/16	0.1 J	0.38 J	0.5	4.2	**45**
	06/17	0.5 U	0.26 J	0.44 J	3.0	**24**
	09/18	0.049 J	0.25	0.41	NA	**24 EJ**
	06/19	0.2 U	0.17 J	0.31 J	3.3	**16**
MW8-12	11/95	**10**	1.0	**13**	140	**85**
	06/96	**14**	1.0 U	**5.0**	180	**63**
	09/96	**20**	2.0	**23**	**250**	**120**
	05/97	6.0	1.0	**12**	67	**120**
	10/97	4.0	1.0 U	**7.0**	41	**44**
	05/98	2.0	2.0	**10**	20	**46**
	10/98	1.0 U	1.0 U	**15**	22	**46**
	05/99	1.0 U	1.0 U	4.0 U	8.0	**25**
	11/99	0.9	2.1	**9.7**	14	**50 H**
	06/00	0.50 J	3.0	**16**	6.8	**54**
	06/01	0.67	4.8	**14**	6.5	**76**
	06/02	0.50 U	4.5	**14**	5.0	**47**
	06/03	0.31 J	3.2	**9.8**	3.2	**36**
	06/04	0.34 J	3.1	**8.5**	4.1	**40**
	06/05	0.3	3.3	**8.8**	2.8	**34**
	06/06	0.28 J	2.5	**7.9**	2.5	**31**
	06/07	0.22 J	3.5	**6.8**	2.0	**37**
	05/08	0.15 J	2.4	**7.7**	1.8	**28**
	06/09	0.18 J	3.4	**11**	2.5	**52**
	06/10	0.2 J	3.9	**6.2**	1.5	**31**
	07/11	0.11 J	3.0	**6.0**	2.1	**31**
	06/12	0.5 UJ	1.8	**6.3**	1.6	**31**
	06/13	0.5 U	0.5	**5.6**	1.2	**23**
	06/14	0.5 U	0.39 J	**5.7**	1.1	**22**
	06/15	0.5 U	0.26 J	4.6	1.7	**17**
	06/16	0.5 U	0.19 J	2.9	1.2	**11**
	06/17	0.5 U	0.28 J	2.8	0.87	**10**
	09/18	0.043 J	0.38	4.1	NA	**16 EJ**
	06/19	0.2 U	0.15 JM	2.3	1.3	**11**

Table G-1. Summary of Selected VOCs Detected in Groundwater and Seeps at OU 2 Area 8 (1995-2019)

Location	Sampling Date	Analyte Concentration (µg/L)				
		1,1-DCE	cis-1,2-DCE	PCE	1,1,1-TCA	TCE
RG (Drinking Water)[a]		**7[b]**	**70**	**5[b]**	**200**	**5[b]**
RG (Surface Water)[a]		**3.2[b,c]**	**--**	**8.9[b,c]**	**42,000**	**81[b,c]**
MW8-14	11/95	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	06/96	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	09/96	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	05/97	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	10/97	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	05/98	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	10/98	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	05/99	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	11/99	0.50 U	3.2	0.50 U	0.50 U	0.50 U
	06/00	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
	06/01	0.12 U	0.12 U	0.11 U	0.84	0.12 U
	06/02	0.50 U	0.50 U	0.50 U	0.18 J	0.50 U
	06/03	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
	06/04	0.50 U	0.50 U	0.50 U	0.12 J	0.50 U
	06/05	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	06/06	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	06/07	0.5 U	0.5 U	0.5 U	0.5 U	0.23 J
	05/08	0.5 U	0.5 U	0.5 U	0.11 J	0.5 U
	06/09	0.2 U	0.5 U	0.5 U	0.1 J	0.5 U
	06/10	0.5 U	0.5 U	0.5 U	0.18 J	0.5 U
	07/11	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	06/12	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
	06/13	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
	06/14	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	06/15	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	06/16	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	06/17	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	09/18	0.02 UJ	0.027	0.014 J	NA	0.031
	06/19	0.2 U	0.2 UM	0.5 U	0.2 U	0.2 U
MW8-15	06/19	0.2 U	0.2 U	0.5 U	0.2 U	0.2 U
MW8-16	11/95	1.0 U	2.0	0.60 J	2.0	**58**
	06/96	1.0 U	2.0	0.80 J	2.0	**72**
	09/96	1.0 U	3.0	0.80 J	2.0	**69**
	05/97	1.0 U	2.0	0.80 J	2.0	**57**
	10/97	1.0 U	1.0 U	0.60 J	2.0	**47**
	05/98	1.0 U	2.0	0.80 J	1.0	**61**
	10/98	1.0 U	3.0	1.0 U	1.0 U	**47**
	05/99	1.0 U	6.0	1.0 U	2.0	**40**
	11/99	0.50 U	5.3	0.8	1.7	**63**
	06/00	0.59	16	0.7	1.1	**51**
	06/01	0.77	21	0.84	1.2	**74**
	06/02	0.67	30 U	0.99	0.83	**130**
	06/03	0.57	28	1.5	0.94	**190 D**
	06/04	0.61	**130 D**	0.75	0.59 J	**120 D**
	06/05	0.9	34	2.2	0.7	**350**
	06/06	0.64	**93 D**	1.1	0.33 J	**200 D**
	06/07	0.68	38	1.5	0.42 J	**430 D**
	05/08	0.65	67 D	1.0	0.18 J	**380 D**
	06/09	0.21	14	0.64	0.13 J	**140 D**
	06/10	0.13 J	9.2	0.64	0.16 J	**79 J**
	07/11	0.1 J	3.6	0.76	0.22 J	**90**
	06/12	0.08	2.7	0.8	0.18 J	**56**
	06/13	0.5 U	0.93	0.79	0.21 J	**50**
	06/14	0.5 U	1.0	0.97	0.19 J	**50**
	06/15	0.09 J	1.8	0.51	0.19 J	**48**
	06/16	0.11 J	28	0.5 U	0.5 U	**8.1**
	06/17	0.09 J	26	0.15 J	0.5 U	**7.2**
	09/18	0.088 J	23 EJ	0.064	NA	4.4
	06/19	0.1 JM	23	0.5 U	0.074 JM	4.6

Table G-1. Summary of Selected VOCs Detected in Groundwater and Seeps at OU 2 Area 8 (1995-2019)

Location	Sampling Date	Analyte Concentration (µg/L)				
		1,1-DCE	cis-1,2-DCE	PCE	1,1,1-TCA	TCE
RG (Drinking Water)[a]		**7[b]**	**70**	**5[b]**	**200**	**5[b]**
RG (Surface Water)[a]		**3.2[b,c]**	**--**	**8.9[b,c]**	**42,000**	**81[b,c]**
Seep A	05/96	**16**	7.0	3.0	88	68
	06/00	3.1	3.7	0.30 J	19	7.4
	06/01	1.4	1.3	0.31 J	11	3.0
	06/02	1.0	0.68	0.50 U	9.5	1.2
	06/03	0.50 U	0.50 U	0.24 J	1.6	0.36 J
	06/04	**13**	9.9	0.92	77	49
	06/05	0.2 U	0.2 U	0.3	2.2	0.3
	06/06	1.5 J	2.0 J	0.3 J	12 J	3.6 J
	06/07	0.42	0.85	0.31 J	2.8	2.4
	05/08	1.1	1.7	0.55	5.5	7.7
	06/09	1.5	1.9	0.39 J	5.7	6.4
	06/10	0.36 J	1.6	0.29 J	1.8	4.4
	07/11	0.5 U	0.09 J	0.1 J	0.5 U	1.4
	06/12	**11 J**	1.9	1.0	53 J	13
	06/13	0.5 U	1.3	0.26 J	1.0	3.3 J
	06/14	2.9	1.0	0.73	21	7.4
	06/15	0.25 J	1.3	0.3 J	3.6	2.5
	06/16	5.4	0.82	0.65	44 J	**7.9**
	06/17	2.6	0.69	0.58	18	**6.7**
Seep B	05/96	1.0 U	0.70 J	1.0 U	1.0	14
	06/00	0.50 U	0.50 U	0.50 U	0.30 J	2.2
	06/01	0.12 U	0.44 J	0.13 J	0.26 J	3.1
	06/02	0.50 U	0.52	0.12 J	0.15 J	5.4
	06/03	0.50 U	0.20 J	0.14 J	0.50 U	1.9
	06/04	0.50 U	0.23 J	0.39 J	0.8	0.61
	06/05	0.2 U	0.2 U	0.4	0.3	0.3
	06/06	0.5 U	0.18 J	0.22 J	0.12 J	0.48 J
	06/07	0.5 U	0.5 U	0.5 U	0.5 U	0.14 J
	05/08	0.5 U	0.12 J	0.17 J	0.1 J	0.41 J
	06/09	0.2 U	0.5 U	0.18 J	0.16 J	0.4 J
	06/10	0.5 U	0.51	0.18 J	0.09 J	5.7
	07/11	0.5 U	0.09 J	0.12 J	0.5 U	1.3
Seep C	09/18	1.0 UJ	0.0078 J	0.14 J	NA	0.06 J
	06/19	0.2 UJ M	0.055 J	0.17 J	0.71	0.26

[a]Protection of human health for ingestion

[b]Value listed accounts for adjustment when the maximum contaminant level or water quality standard is sufficiently protective to serve as the RG for that individual chemical. Individual cleanup levels may require downward adjustment for multiple chemical contaminants or multiple exposure pathways. Value does not account for adjustments due to background levels or practical laboratory quantitation limits.

[c]Protection of human health for fish ingestion

Notes:

Bolded value indicates concentration in the monitoring well exceeds or is equal to the RG for drinking water, or in the seep exceeds or is equal to the RG for surface water.

Shaded row indicates data evaluated in this review period.

Yellow highlighted value exceeds or is equal to the surface water RG.

* - The reporting limit exceeds the RG

Data from 1995 to 2004 are from U.S. Navy 2005a, from 2005 to 2008 are from U.S. Navy 2008c, from 2009 are from U.S. Navy 2009d, and from 2010 through 2014 in U.S. Navy 2015c.

D - The reported result is from a dilution.

DCE - dichloroethene

H - Analytical result is from an analysis reported past the holding time.

J - The result is an estimated concentration that is less than the MRL, but greater than or equal to the MDL.

MDL - method detection limit

µg/L - microgram per liter

MRL - method reporting limit

PCE - tetrachloroethene

RG - remediation goal

TCA - trichloroethane

TCE - trichloroethene

U - The compound was analyzed for, but was not detected ("nondetect") at or above the MRL/MDL.

Table G-2. Summary of Other VOCs Detected in Groundwater at OU 2 Area 8 (2015-2019)

Location ID	Sampling Date	Chloroform (µg/L)	CT (µg/L)	1,1-DCA (µg/L)	1,2-DCA (µg/L)	trans-1,2-DCE (µg/L)	1,1,2-TCA (µg/L)	Toluene (µg/L)	Total Xylenes (µg/L)
Drinking Water Remediation Goals		**7.2**	**0.34**	**800**	**5**	**100**	**5**	**1,000**	**10,000**
Surface Water Remediation Goals		**470**	**4.4**	**NE**	**5.9**	**33,000**	**42**	**49,000**	**NE**
MW8-8	06-15	1.4		0.5 U		1.5		0.46 J	0.5 U
MW8-8	06-16	1.9		0.5 U		2.2		0.5 U	0.5 U
MW8-8	06-17	0.62		0.5 U		3.0	0.019 J	0.5 U	0.5 U
MW8-8	09-18	0.54 J	0.26 J	0.5 U	0.006 J	1.8	0.23		
MW8-8	06-19	0.58	0.2 U	0.063 JM	0.2 U	1.9	0.2 UM		
MW8-9	06-15	0.16 J		0.5 U		0.12 J		0.77	0.11 J
MW8-9	06-16	0.5 U		0.5 U		0.5 U		0.17 J	0.5 U
MW8-9	06-17	0.5 U		0.5 U		0.5 U		0.5 U	0.5 U
MW8-9	09-18	0.024 J	0.046 J		0.02 J	0.02 U	0.02 U		
MW8-9	06-19	0.2 UM	0.2 U	0.2 UM	0.2 U	0.2 U	0.2 U		
MW8-11	06-15	0.48 J		0.12 J		0.56		1.1	0.5 U
MW8-11	06-16	0.5 U		0.9 J		0.26 J		0.12 J	0.5 U
MW8-11	06-17	0.23 J		0.1 J		0.11 J		0.5 U	0.5 U
MW8-11	09-18	0.26 J	**0.86 J**		0.019 J	0.14	0.033		
MW8-11	06-19	0.18 J	0.2 U	0.08 J	0.2 U	0.2 U	0.2 U		
MW8-11 (Dup)	06-16	0.5 U		0.11 J		0.26 J		0.1 J	0.5 U
MW8-11 (Dup)	06-17	0.23 J		0.1 J		0.14 J		0.5 U	0.5 U
MW8-11 (Dup)	09-18	0.26 J	**0.86 J**		0.019 J	0.14	0.032		
MW8-11 (Dup)	06-19	0.18 J	0.2 U	0.084 J	0.2 U	0.2 U	0.2 U		
MW8-12	06-15	3.0		0.5 U		1.2		0.5 U	0.13 J
MW8-12	06-16	1.1		0.5 U		0.75		0.1 J	0.5 U
MW8-12	06-17	0.74		0.5 U		0.78		0.5 U	0.5 U
MW8-12	09-18	0.79 J	**0.46 J**		0.006 J	0.89	0.13		
MW8-12	06-19	0.31	0.2 U	0.2 UM	0.2 U	0.37 M	0.2 U		
MW8-14	06-15	0.5 U		0.5 U		0.5 U		0.5 U	0.5 U
MW8-14	06-16	0.5 U		0.5 U		0.5 U		0.5 U	0.5 U
MW8-14	06-17	0.5 U		0.5 U		0.5 U		0.5 U	0.5 U
MW8-14	09-18	0.009 J	0.02 UJ		0.02 U	0.02 U	0.02 U		
MW8-14	06-19	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U		
MW8-15	06-19	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U		
MW8-16	06-15	1.8		0.5 U		0.5 U		0.49 J	0.12 J
MW8-16	06-16	0.5 U		0.5 U		0.13 J		0.5 U	0.5 U
MW8-16	06-17	0.14 J		0.08 J		0.19 J		0.5 U	0.5 U
MW8-16	09-18	0.84 J	0.029 J		0.02 U	0.25	0.02 U		
MW8-16	06-19	0.11 JM	0.2 U	0.081 JM	0.2 U	0.25	0.2 U		

Notes:

Bold indicates detected value is equal to or exceeds the drinking water RG.

µg/L – microgram per liter

CT – carbon tetrachloride

DCA – dichloroethane

DCE – dichloroethene

Dup – field duplicate

ID – identification

J – analyte positively identified, but result is estimated

M – manual integrated compound

TCA – trichloroethane

U – analyte was not detected at or above the indicated practical quantitation limit

VOC – volatile organic compounds

Table G-3. Summary of 1,4-Dioxane Results in Groundwater and Seeps at OU 2 Area 8 (2007-2019)

Location	Sampling Date	1,4-Dioxane (µg/L)
MW8-8	06/07	**0.70 J**
	07/11	1.0 U *
	06/12	**0.76 J**
	06/13	1.0 U *
	06/14	1.0 U *
	06/15	0.22 J
	06/16	0.41
	06/17	**1.1**
	09/18	0.43
	06/19	**0.47**
MW8-9	06/07	1.0 U *
	07/11	1.0 U *
	06/12	1.0 U *
	06/13	1.0 U *
	06/14	1.0 U *
	06/15	0.40 U
	06/16	0.25 J
	06/17	0.40 U
	09/18	0.40 U
	06/19	0.19 U
MW8-11	06/07	**39**
	07/11	**29**
	06/12	**19**
	06/13	**11**
	06/14	**11**
	06/15	**12**
	06/16	**14**
	06/17	**16**
	09/18	**8.1**
	06/19	**8.7**
MW8-12	06/07	**1.1**
	07/11	0.18 J
	06/12	**0.53 J**
	06/13	1.0 U *
	06/14	0.31 J
	06/15	**0.53**
	06/16	**1.1**
	06/17	**1.1**
	09/18	**0.96**
	06/19	**0.44**

Table G-3. Summary of 1,4-Dioxane Results in Groundwater and Seeps at OU 2 Area 8 (2007-2019)

Location	Sampling Date	1,4-Dioxane (µg/L)
MW8-14	06/07	1.0 U *
	07/11	1.0 U *
	06/12	1.0 J
	06/13	1.0 U *
	06/14	1.0 U *
	06/15	0.40 U
	06/16	0.16 J
	06/17	0.40 U
	09/18	0.40 U
	06/19	0.19 U
MW8-15	06/19	0.19 U
MW8-16	06/07	1.0 U *
	07/11	1.0 U *
	06/12	1.0 U *
	06/13	1.0 U *
	06/14	1.0 U *
	06/15	0.40 U
	06/16	0.22 J
	06/17	0.40 U
	09/18	0.40 U
	06/19	0.19 U
Seep A	07/11	1.0 U *
Seep B	07/11	1.0 U *

Notes:

No remediation goal is established for 1,4-dioxane.

Bold value is equal to or exceeds the Model Toxics Control Act Method B cleanup level (0.44 µg/L).

Data are from U.S. Navy 2015c.

* - Reporting limit exceeds the MTCA Method B cleanup level.

J - The result is an estimated concentration that is less than the MRL, but greater than or equal to the MDL.

MDL - method detection limit

µg/L - microgram per liter

MRL - method reporting limit

U - The compound was analyzed for, but was not detected ("nondetect") at or above the MRL/MDL.

Table G-4. Summary of Inorganics Detected in Groundwater and Seeps at OU 2 Area 8 Exceeding One-Half of the MTCA Method B Cleanup Levels (1995-2019)

Location	Sampling Date	Analyte Concentration (µg/L)																					
		Arsenic				Cadmium		Total Chromium		Chromium VI		Copper		Lead		Mercury		Nickel		Silver		Thallium		Zinc	
		Total	Total (ICP)	Dissolved	Dissolved (ICP)	Total	Dissolved	Total	Dissolved[b]	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
RG Drinking Water		**0.05[c]**				**5**		**50[c]**		**80**		**590**		**15**		**2**		**100**		**48**		**1.1**		**4,800**	
RG Surface Water		**0.14[a,c]**				**8**		**50[d]**		**50**		**2.5**		**5.8**		**0.025**		**7.9**		**1.2**		**1.6**		**77**	
MW8-6	06/96	NA	NA	NA	**1.1 B**	NA	(-)	NA	NA	(-)	NA	NA	(-)	NA	NA	NA	NA	NA	(-)	NA	NA	NA	(-)	NA	54.8
MW8-7	11/95	**3.3 +**	NA	NA	NA	(-)	NA	NA	NA	(-)	NA	(-)	NA	(-)	NA	0.11	NA	(-)	NA	(-)	NA	NS	**2.4 +**	(-)	NA
MW8-8	11/95	(-)	NA	NA	NA	(-)	NA	NA	NA	**390**	NA	4.8 +	NA	(-)	NA	(-)	NA	12.8 +	NA	(-)	NA	(-)	NA	(-)	NA
	05/96	NA	NA	NA	**1.4 B**	NA	(-)	NA	NA	**380**	NA	NA	(-)	NA	NA	NA	NA	NA	(-)	NA	NA	NA	**1.2 BN**	NA	(-)
	09/96	NA	NA	(-)	NA	NA	(-)	**330**	NA	**320**	NA	NA	(-)	NA	NA	NA	NA	NA	(-)	NA	(-)	NA	NA	NA	(-)
	05/97	NA	NA	2.0 UN *	NA	NA	(-)	NA	**319**	NA	**350**	NA	2.0 U	NA	(-)	NA	0.20 U *	NA	5.0 U	NA	4.0 U *	NA	1.0 UN	NA	(-)
	10/97	NA	NA	0.50 UN *	NA	NA	(-)	NA	**372**	NA	NA	NA	2.3 B	NA	(-)	NA	0.10 U *	NA	11.0 U *	NA	1.8 B	NA	1.8 UN *	NA	(-)
	05/99	NA	NA	0.50 U *	NA	NA	(-)	NA	**344**	NA	NA	NA	(-)	NA	(-)	NA	0.10 U *	NA	4.0 U	NA	1.0 UN	NA	1.2 U *	NA	(-)
	10/98	NA	NA	1.8 U *	NA	NA	(-)	NA	**322**	NA	NA	NA	(-)	NA	(-)	NA	0.10 U *	NA	(-)	NA	1.0 UN	NA	1.2 U *	NA	(-)
	05/99	NA	NA	1.7 U *	NA	NA	(-)	NA	**184 N**	NA	NA	NA	(-)	NA	(-)	NA	0.10 U *	NA	3.5 BN	NA	2.2 U *	NA	1.0 UN	NA	(-)
	11/99	NA	NA	5 U *	NA	NA	2.5	NA	**154**	NA	NA	NA	10 U *	NA	2 U	NA	0.2 U *	NA	20 U *	NA	10 U *	NA	5 U *	NA	10 U
	06/00	NA	NA	**0.20 J**	NA	NA	1.33	NA	**95.7**	NA	**102 J**	NA	0.46 J	NA	0.03	NA	0.10 U *	NA	3.21 J	NA	0.907	NA	0.01 U	NA	3.1
	06/01	NA	NA	0.3 UJ *	NA	NA	0.58	NA	**71.4**	NA	NS	NA	0.29 J	NA	0.04 U	0.0022	NA	NA	1.5	NA	0.62	NA	0.005 U	NA	2 U
	06/02	NA	NA	**0.13 J**	NA	NA	0.83 J	NA	**191**	NA	NA	NA	0.40	NA	0.15 UJ	NA	0.10 U *	NA	1.45	NA	0.47 J	NA	0.006 J	NA	0.8
	06/03	NA	NA	**0.43 J**	NA	NA	0.15	NA	**84.1 J**	NA	NA	NA	0.49	NA	0.04	NA	0.10 U *	NA	0.76 J	NA	0.17	NA	0.005 B	NA	0.7
	06/04	NA	NA	**0.32 B**	NA	NA	0.2	NA	**111**	NA	NA	NA	0.45	NA	0.009 B	NA	0.04 U *	NA	0.79	NA	0.489	NA	0.003 U	NA	1.45
	06/05	NA	NA	**0.44**	NA	NA	1.23	NA	**88.3**	NA	NA	NA	0.42	NA	0.1 U	NA	0.1 U *	NA	2.8	NA	0.265	NA	0.01 U	NA	0.99
	06/06	NA	NA	**0.27 B**	NA	NA	0.334	NA	**88.6**	NA	NA	NA	0.369	NA	0.021 U	NA	0.2 U *	NA	0.61 J	NA	0.284	NA	0.02 U	NA	1.02
	06/07	NA	NA	**0.26 J**	NA	NA	0.12	NA	**81.9**	NA	NA	NA	5.1	NA	0.24	NA	0.2 U *	NA	0.69	NA	0.19	NA	0.02 U	NA	1
	05/08	NA	NA	**0.21 B**	NA	NA	0.124	NA	**96**	NA	NA	NA	0.496	NA	0.054 U	NA	0.2 U *	NA	1.08	NA	0.182	NA	0.005 B	NA	0.77
	06/09	NA	NA	**0.21 J**	NA	NA	0.432	NA	43.8	NA	NA	NA	0.437	NA	0.020 U	NA	0.2 U *	NA	1.05	NA	0.746 J	NA	0.009 J	NA	1.43
	06/10	NA	NA	**0.85**	NA	NA	0.114	NA	**55.6**	NA	NA	NA	0.77	NA	0.02 UJ	NA	0.02 J	NA	0.72	NA	0.292	NA	0.02 U	NA	0.87
	07/11	NA	NA	**0.91**	NA	NA	0.036 UJ	NA	**118**	NA	NA	NA	0.55	NA	0.02 UJ	NA	0.2 U *	NA	0.4	NA	0.198	NA	0.02 U	NA	0.48 J
	06/12	NA	NA	**0.7**	NA	NA	0.022	NA	**59.6**	NA	NA	NA	0.51	NA	0.107	NA	0.2 U *	NA	0.68	NA	0.2	NA	0.013 J	NA	0.5
	06/13	NA	NA	**0.648**	NA	NA	0.008	NA	**52.3**	NA	NA	NA	0.33	NA	0.02 U	NA	0.2 U *	NA	0.34	NA	0.211	NA	0.02 U	NA	0.37 J
	06/14	NA	NA	**0.56**	NA	NA	0.015 J	NA	**66.7**	NA	NA	NA	0.39 J	NA	0.05	NA	0.0023	NA	0.33	NA	0.336	NA	0.02 U	NA	0.38 J
	06/15	NA	NA	**0.61**	NA	NA	0.04 UJ	NA	**83.2**	NA	NA	NA	1.05	NA	0.122	NA	0.00361	NA	0.28	NA	0.327 J	NA	0.02 UJ	NA	1.69
	06/16	NA	NA	**0.8**	NA	NA	0.082	NA	**53.6**	NA	NA	NA	0.3	NA	0.147	NA	0.00264	NA	0.3	NA	0.496	NA	0.02 UJ	NA	2.1
	07/17	NA	NA	**0.33 J**	NA	NA	0.057	NA	**70.2**	NA	NA	NA	0.32	NA	0.008 J	NA	NA	NA	0.41	NA	0.466	NA	NA	NA	0.54
	09/18	NA	NA	**0.6 J**	NA	NA	0.061	NA	**60.4**	NA	NA	NA	0.41	NA	0.04 U	NA	NA	NA	0.43	NA	0.484	NA	NA	NA	0.5 U
	06/19	NA	NA	**0.42 J**	NA	NA	0.207	NA	**64.4**	NA	NA	NA	0.27	NA	0.02 U	NA	NA	NA	0.57	NA	0.613	NA	NA	NA	2.2
MW8-9	11/95	**3.0 NW**	NA	NA	NA	(-)	NA	NA	NA	(-)	NA	3.6 W+	NA	(-)	NA	(-)	NA	(-)	NA	(-)	NA	(-)	NA	(-)	NA
	05/96	NA	NA	NA	**2.6 B**	NA	(-)	NA	NA	**380**	NA	NA	(-)	NA	NA	NA	NA	NA	(-)	NA	NA	NA	(-)	NA	(-)
	09/96	NA	NA	**3.4 BW**	NA	NA	3.5 B	(-)	NA	(-)	NA	NA	(-)	NA	NA	NA	NA	NA	(-)	NA	(-)	NA	NA	NA	(-)
	05/97	NA	NA	**3.2 NW**	NA	NA	(-)	NA	(-)	NA	(-)	NA	2.0 U	NA	(-)	NA	0.20 UN *	NA	5.0 U	NA	4.0 U *	NA	**134 N**	NA	(-)
	10/97	NA	NA	**1.4 BNW**	NA	NA	(-)	NA	(-)	NA	NA	NA	(-)	NA	(-)	NA	0.35	NA	11.0 U	NA	1.0 U	NA	1.8 UNW *	NA	(-)
	04/98	NA	NA	**1.1 BW**	NA	NA	(-)	NA	(-)	NA	NA	NA	(-)	NA	(-)	NA	0.10 U *	NA	7.0 B	NA	1.0 UN	NA	6.0 U *	NA	(-)
	10/98	NA	NA	**5.4 B**	NA	NA	(-)	NA	(-)	NA	NA	NA	(-)	NA	(-)	NA	0.13 B	NA	38.2 B	NA	2.0 B	NA	6.0 UW *	NA	(-)
	05/99	NA	NA	**2.0 B**	NA	NA	(-)	NA	(-)	NA	NA	NA	(-)	NA	(-)	NA	0.10 U *	NA	16.3 BN	NA	2.7 B	NA	10.0 UNW *	NA	(-)
	11/99	NA	NA	5 U *	NA	NA	**14**	NA	8	NA	NA	NA	10 U *	NA	2 U	NA	0.2 U *	NA	20 U *	NA	10	NA	5 U	NA	10 U
	06/00	NA	NA	**0.80 J**	NA	NA	1.05	NA	9.8	NA	16 J	NA	0.95 J	NA	0.97	NA	0.10 U *	NA	8.57 J	NA	3.7	NA	0.01 U	NA	8.6
	06/01	NA	NA	**0.5 J**	NA	NA	1.13	NA	9.7	NA	NS	NA	0.78 J	NA	0.04 U	0.0036		NA	4.2	NA	1.61	NA	0.005 B	NA	3 U
	06/02	NA	NA	**0.43 J**	NA	NA	0.65 J	NA	6.43	NA	NA	NA	0.90	NA	0.049 UJ	NA	0.10 U *	NA	4.97	NA	1.44 J	NA	0.003 J	NA	3.2
	06/03	NA	NA	**0.58 J**	NA	NA	0.98	NA	6.9 J	NA	NA	NA	1.38	NA	0.23	NA	0.10 B	NA	4.85 J	NA	1.66	NA	0.015 B	NA	4.9
	06/04	NA	NA	**0.42 B**	NA	NA	0.51	NA	7.09	NA	NA	NA	0.73	NA	0.52	NA	0.05 U *	NA	3.91	NA	1.3	NA	0.003 U	NA	1.57
	06/05	NA	NA	**0.43**	NA	NA	0.904	NA	6.8	NA	NA	NA	0.75	NA	0.1 U	NA	0.1 U *	NA	3.5	NA	0.68	NA	0.01 U	NA	2.17
	06/06	NA	NA	**0.49 B**	NA	NA	0.454	NA	6.87	NA	NA	NA	0.652	NA	0.02 U	NA	0.2 U *	NA	2.57 J	NA	0.863	NA	0.02 U	NA	1.01
	06/07	NA	NA	**0.52 J**	NA	NA	0.3	NA	6.1	NA	NA	NA	8.1	NA	0.35	NA	0.2 U *	NA	2.3	NA	0.48	NA	0.02 U	NA	1.3
	05/08	NA	NA	**0.69**	NA	NA	0.363	NA	6.38	NA	NA	NA	0.654	NA	0.026 U	NA	0.2 U *	NA	2.25	NA	0.421	NA	0.004 B	NA	0.82
	06/09	NA	NA	**0.63 J**	NA	NA	0.59	NA	4.85	NA	NA	NA	0.659	NA	0.020 U	NA	0.2 U *	NA	1.55	NA	0.263 J	NA	0.020 U	NA	0.59
	06/10	NA	NA	**0.73**	NA	NA	0.174	NA	4.28	NA	NA	NA	0.739	NA	0.02 UJ	NA	0.2 U *	NA	1.2	NA	0.312	NA	0.02 UJ	NA	4.57
	07/11	NA	NA	**0.63**	NA	NA	0.343	NA	7.46	NA	NA	NA	0.739	NA	0.014 J	NA	0.2 U *	NA	1.74	NA	0.497	NA	0.02 UJ	NA	0.65
	06/12	NA	NA	**0.61**	NA	NA	0.286	NA	6.09	NA	NA	NA	0.581	NA	0.015 J	NA	0.2 U *	NA	1.48	NA	0.43	NA	0.02 UJ	NA	0.6
	06/13	NA	NA	**0.67**	NA	NA	0.238	NA	5.41	NA	NA	NA	0.561	NA	0.009 J	NA	0.2 U *	NA	1.28	NA	0.245	NA	0.02 UJ	NA	0.48 J
	06/14	NA	NA	**0.66**	NA	NA	0.231	NA	6.3	NA	NA	NA	0.564	NA	0.18	NA	0.00439	NA	1.38	NA	0.36	NA	0.02 UJ	NA	0.7
	06/15	NA	NA	**0.67 J**	NA	NA	0.438	NA	6.32	NA	NA	NA	1.98	NA	0.09	NA	0.003	NA	1.87	NA	0.488	NA	0.02 U	NA	2.5
	06/16	NA	NA	**0.56**	NA	NA	0.523	NA	7.81	NA	NA	NA	0.99	NA	12	NA	0.00374	NA	1.54	NA	0.668	NA	0.02 U	NA	6.58
	07/17	NA	NA	**0.49 J**	NA	NA	0.284	NA	5	NA	NA	NA	0.57	NA	0.016 J	NA	NA	NA	1.51	NA	0.439	NA	NA	NA	0.67
	09/18	NA	NA	**0.7**	NA	NA	0.476	NA	10.3	NA	NA	NA	0.59	NA	0.05 UJ	NA	NA	NA	1.24	NA	0.507	NA	NA	NA	0.65
	06/19	NA	NA	**0.66**	NA	NA	0.73	NA	8.3	NA	NA	NA	0.47	NA	0.059 UJ	NA	NA	NA	1.44	NA	0.375	NA	NA	NA	0.57

Table G-4. Summary of Inorganics Detected in Groundwater and Seeps at OU 2 Area 8 Exceeding One-Half of the MTCA Method B Cleanup Levels (1995-2019)

Location	Sampling Date	Analyte Concentration (µg/L)																					
		Arsenic				Cadmium		Total Chromium		Chromium VI		Copper		Lead		Mercury		Nickel		Silver		Thallium		Zinc	
		Total	Total (ICP)	Dissolved	Dissolved (ICP)	Total	Dissolved	Total	Dissolved[b]	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
RG Drinking Water		**0.05[c]**				**5**		**50[c]**		**80**		**590**		**15**		**2**		**100**		**48**		**1.1**		**4,800**	
RG Surface Water		**0.14[a,c]**				**8**		**50[d]**		**50**		**2.5**		**5.8**		**0.025**		**7.9**		**1.2**		**1.6**		**77**	
MW8-11	11/95	**2.0 W+**	NA	NA	NA	**251**	NA	NA	NA	**950**	NA	13.4 S	NA	(-)	NA	0.22	NA	51.3	NA	4.2	NA	(-)	NA	207	NA
	05/96	NA	NA	NA	1.0 U *	NA	**444**	NA	NA	**800**	NA	NA	18.9 B	NA	NA	NA	NA	NA	39.5 B	NA	NA	NA	(-)	NA	248
	09/96	NA	NA	**2.4 BW**	NA	NA	**262**	**626**	NA	**720**	NA	NA	14.3 B	NA	NA	NA	NA	NA	42.3	NA	(-)	NA	NA	NA	166
	05/97	NA	NA	**2.1 NW**	NA	NA	**210**	NA	**441**	NA	**610**	NA	12.4	NA	(-)	NA	0.20 UN *	NA	30.5	NA	7.0 N	NA	10.0 UW *	NA	161
	10/97	NA	NA	**0.66 BNW**	NA	NA	**278**	NA	**377**	NA	NA	NA	11.7 B	NA	(-)	NA	0.32	NA	40.0	NA	4.4 B	NA	9.0 UNW *	NA	178
	05/98	NA	NA	**0.50 UW ***	NA	NA	**320**	NA	**303**	NA	NA	NA	12.5 B	NA	(-)	NA	0.10 U *	NA	36.9 B	NA	5.2 BN	NA	6.0 U *	NA	193
	10/98	NA	NA	**2.1 B**	NA	NA	**126 E**	NA	**459**	NA	NA	NA	9.0 B	NA	(-)	NA	0.17 B	NA	16.2 B	NA	2.2 B	NA	1.2 UW *	NA	50.9
	05/99	NA	NA	**2.6 B**	NA	NA	**33.5 N**	NA	**198**	NA	NA	NA	5.3 B	NA	(-)	NA	0.10 B	NA	4.6 BN	NA	2.2 U *	NA	10.0 UNW *	NA	(-)
	11/99	NA	NA	5 U *	NA	NA	**205**	NA	**201**	NA	NA	NA	10 U *	NA	2U	NA	0.2 U *	NA	20 U *	NA	10	NA	5 U *	NA	89
	06/00	NA	NA	**0.80 J**	NA	NA	**106**	NA	**221**	NA	**227 J**	NA	4.44 J	NA	0.16	NA	0.10 U *	NA	10.2 J	NA	2.09	NA	0.04	NA	109
	06/01	NA	NA	**0.7 J**	NA	NA	**129**	NA	**429**	NA	NS	NA	4.95 J	NA	0.062	0.0071		NA	13	NA	2.29	NA	0.038	NA	110
	06/02	NA	NA	**0.52 J**	NA	NA	**420 J**	NA	**608**	NA	NA	NA	4.90	NA	0.047 UJ	NA	0.10 U *	NA	9.46	NA	3.87 J	NA	0.040 J	NA	221
	06/03	NA	NA	**0.61 J**	NA	NA	**353**	NA	**302 J**	NA	NA	NA	5.15	NA	0.02 U	NA	0.10 U *	NA	9.10 J	NA	5.87	NA	0.041	NA	134
	06/04	NA	NA	**0.57**	NA	NA	**357**	NA	**290**	NA	NA	NA	5.29	NA	0.036	NA	0.08 U *	NA	31.9	NA	6.45	NA	0.053	NA	157
	06/05	NA	NA	**1.9**	NA	NA	**266**	NA	**230**	NA	NA	NA	4.63	NA	0.1 U	NA	0.1 U *	NA	24.4	NA	6	NA	0.05	NA	91
	06/06	NA	NA	**0.61**	NA	NA	**338**	NA	**157**	NA	NA	NA	3.48	NA	0.066 U	NA	0.2 U *	NA	25.8 J	NA	6.17	NA	0.0405	NA	135
	06/07	NA	NA	**0.53 J**	NA	NA	**231**	NA	**150**	NA	NA	NA	3.60	NA	0.094	NA	0.2 U *	NA	19.3	NA	4.70	NA	0.038	NA	81.0
	05/08	NA	NA	**0.82**	NA	NA	**154**	NA	**191**	NA	NA	NA	3.44	NA	0.055 U	NA	0.2 U *	NA	15.1	NA	3.5	NA	0.025	NA	58.1
	06/09	NA	NA	**0.94 J**	NA	NA	**115**	NA	**163**	NA	NA	NA	3.1	NA	0.020 U	NA	0.2 U *	NA	11.1	NA	2.45 J	NA	0.024	NA	49.1
	06/10	NA	NA	**0.87**	NA	NA	**214**	NA	**157**	NA	NA	NA	3.09	NA	0.02 UJ	NA	0.02 J	NA	19.8	NA	5.86	NA	0.034 UJ	NA	85.7
	07/11	NA	NA	**0.68**	NA	NA	**166**	NA	**165**	NA	NA	NA	3	NA	0.023	NA	0.2 U *	NA	16	NA	3.55	NA	0.025	NA	68
	06/12	NA	NA	**0.7**	NA	NA	**152**	NA	**153**	NA	NA	NA	2.81	NA	0.02 U	NA	0.2 U *	NA	11.4	NA	3.22	NA	0.026 UJ	NA	68.4
	06/13	NA	NA	**0.86**	NA	NA	**85.1**	NA	**187**	NA	NA	NA	2.61	NA	0.014 J	NA	0.2 U *	NA	9.77	NA	2.77	NA	0.022 UJ	NA	44
	06/14	NA	NA	**0.93**	NA	NA	**106**	NA	**164**	NA	NA	NA	2.76	NA	0.05	NA	0.00973	NA	12.1	NA	2.6	NA	0.033 UJ	NA	43
	06/15	NA	NA	**0.87 J**	NA	NA	**127**	NA	**182**	NA	NA	NA	3.52	NA	0.047	NA	0.0102	NA	13.8	NA	3.11	NA	0.026	NA	52.4
	06/16	NA	NA	**0.74**	NA	NA	**131**	NA	**145**	NA	NA	NA	5.75	NA	8.02	NA	0.0114	NA	19.1	NA	4.21	NA	0.029	NA	85
	06/17	NA	NA	**0.91**	NA	NA	**135**	NA	**140**	NA	NA	NA	2.62	NA	0.017 J	NA	NA	NA	14.6	NA	2.7	NA	NA	NA	48
	09/18	NA	NA	**0.77**	NA	NA	**122**	NA	**168**	NA	NA	NA	2.81	NA	0.094 UJ	NA	NA	NA	5.87	NA	3.85	NA	NA	NA	47
	06/19	NA	NA	**1.09**	NA	NA	**161**	NA	**135**	NA	NA	NA	2.52	NA	0.05 U	NA	NA	NA	13.7	NA	2.77	NA	NA	NA	47.9
MW8-12	11/95	**5.1 N**	NA	NA	NA	**28.6**	NA	NA	NA	**1500**	NA	329 S+	NA	11.7	NA	0.19	NA	34.6 +	NA	(-)	NA	(-)	NA	(-)	NA
	05/96	NA	NA	NA	**3.6 B**	NA	**46.1**	NA	NA	**380**	NA	NA	(-)	NA	NA	NA	NA	NA	17.9 B	NA	NA	NA	(-)	NA	29.7
	09/96	NA	NA	**1.9 B**	NA	NA	**53.8**	**1740**	NA	**1800**	NA	NA	(-)	NA	NA	NA	NA	NA	49.3	NA	(-)	NA	NA	NA	(-)
	05/97	NA	NA	2.0 UN *	NA	NA	**565**	NA	**1280**	NA	**1400**	NA	64.4	NA	20 UN *	NA	0.20 UN *	NA	**673**	NA	40 UN *	NA	1.0 UNW	NA	727
	10/97	NA	NA	**1.8 BN**	NA	NA	**154**	NA	**961**	NA	NA	NA	150	NA	(-)	NA	0.10 U *	NA	**423**	NA	1.8 B	NA	1.8 UNW *	NA	325
	05/98	NA	NA	**2.4 BW**	NA	NA	**7.3**	NA	**728**	NA	NA	NA	5.2 B	NA	(-)	NA	0.10 U *	NA	7.5 B	NA	1.0 BN	NA	1.2 U *	NA	(-)
	10/98	NA	NA	1.8 U *	NA	NA	**6.5 E**	NA	**1090**	NA	NA	NA	4.0 B	NA	(-)	NA	0.15 B	NA	8.9 B	NA	1.2 B	NA	1.2 U *	NA	(-)
	5/99	NA	NA	1.7 U *	NA	NA	**45.7 N**	NA	**815 N**	NA	NA	NA	19.9 B	NA	3.2 N	NA	0.10 U *	NA	70.0 N	NA	2.2 U *	NA	1.0 UNW	NA	48.9
	11/99	NA	NA	NA	NA	NA	(-)	NA	(-)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	06/00	NA	NA	**0.20 J**	NA	NA	**20**	NA	**163**	NA	**216 J**	NA	5.65 J	NA	0.75	NA	0.10 U *	NA	26.8 J	NA	0.88	NA	0.01 U	NA	24.9
	06/01	NA	NA	**0.3 J**	NA	NA	**20.7**	NA	**193**	NA	NA	NA	6.14 J	NA	1.2	0.0022	NA	NA	22	NA	1.24	NA	0.013 B	NA	25.3
	06/02	NA	NA	**0.37 J**	NA	NA	4.42 J	NA	**238**	NA	NA	NA	4.10	NA	0.17 UJ	NA	0.10 U *	NA	2.77	NA	0.27 K	NA	0.006 J	NA	1.8
	06/03	NA	NA	**0.32 J**	NA	NA	**7.84**	NA	**107 J**	NA	NA	NA	2.78	NA	0.15	NA	0.10 U *	NA	4.36 J	NA	0.47	NA	0.013 B	NA	2.3
	06/04	NA	NA	**0.43 B**	NA	NA	3.23	NA	**146**	NA	NA	NA	5.15	NA	0.096	NA	0.05 U *	NA	2.55	NA	-0.197	NA	0.007 B	NA	0.92
	06/05	NA	NA	**1.3**	NA	NA	2.04	NA	**114**	NA	NA	NA	3.7	NA	0.219	NA	0.1 U *	NA	3	NA	0.22	NA	0.01 U	NA	5.97
	06/06	NA	NA	**0.28 B**	NA	NA	2.71	NA	**113**	NA	NA	NA	2.67	NA	0.048 U	NA	0.2 U *	NA	1.99 J	NA	0.279	NA	0.02 U	NA	4.17
	06/07	NA	NA	**0.47 J**	NA	NA	0.31	NA	**101**	NA	NA	NA	2.6	NA	0.054	NA	0.2 U *	NA	0.92	NA	0.037	NA	0.02 U	NA	0.67
	05/08	NA	NA	**0.53**	NA	NA	0.431	NA	**100**	NA	NA	NA	2.18	NA	0.036 U	NA	0.2 U *	NA	1.07	NA	0.057	NA	0.004 B	NA	0.25 B
	06/09	NA	NA	**0.68 J**	NA	NA	0.109	NA	**80.8**	NA	NA	NA	1.65	NA	0.018 J	NA	0.2 U *	NA	0.57	NA	0.016 J	NA	0.006 J	NA	0.15 J
	06/10	NA	NA	**0.35 J**	NA	NA	0.433	NA	**74.8**	NA	NA	NA	2.48	NA	0.264 J	NA	0.02 J	NA	0.93	NA	0.05	NA	0.02 UJ	NA	0.39 J
	07/11	NA	NA	**0.46 J**	NA	NA	0.194	NA	**137**	NA	NA	NA	2.22	NA	0.048	NA	0.2 U *	NA	0.66	NA	0.027 UJ	NA	0.02 UJ	NA	0.2 J
	06/12	NA	NA	**0.5**	NA	NA	0.128	NA	**106**	NA	NA	NA	1.78	NA	0.028	NA	0.2 U *	NA	0.57	NA	0.019 J	NA	0.034 J	NA	0.5 UJ
	06/13	NA	NA	**4.63**	NA	NA	0.063	NA	**89.4**	NA	NA	NA	1.53	NA	0.032	NA	0.2 U *	NA	0.42	NA	0.008 J	NA	0.02 U	NA	0.43 J
	06/14	NA	NA	**2.2**	NA	NA	0.096	NA	**97.2**	NA	NA	NA	2.7 J	NA	0.064	NA	0.00142	NA	0.33	NA	0.02 UJ	NA	0.02 U	NA	0.35 J
	06/15	NA	NA	**2.3**	NA	NA	0.082	NA	**118**	NA	NA	NA	2.11	NA	0.425	NA	0.00328	NA	0.58	NA	0.02 UJ	NA	0.02 UJ	NA	0.58
	06/16	NA	NA	**0.3 J**	NA	NA	0.797	NA	**87.69**	NA	NA	NA	2.29	NA	0.057 UJ	NA	0.00367	NA	1.11	NA	0.141	NA	0.02 U	NA	1.63
	06/17	NA	NA	**0.45 J**	NA	NA	0.352	NA	**72.9**	NA	NA	NA	1.45	NA	0.039	NA	NA	NA	0.79	NA	0.045	NA	NA	NA	0.33 J
	09/18	NA	NA	**0.45 J**	NA	NA	0.272	NA	**159**	NA	NA	NA	1.79	NA	0.061 UJ	NA	NA	NA	0.88	NA	0.052	NA	NA	NA	0.43 J
	06/19	NA	NA	**0.33 J**	NA	NA	2.73	NA	**89.7**	NA	NA	NA	1.65	NA	0.132 UJ	NA	NA	NA	2.99	NA	0.327	NA	NA	NA	13.5

Table G-4. Summary of Inorganics Detected in Groundwater and Seeps at OU 2 Area 8 Exceeding One-Half of the MTCA Method B Cleanup Levels (1995-2019)

Location	Sampling Date	Analyte Concentration (µg/L)																					
		Arsenic				Cadmium		Total Chromium		Chromium VI		Copper		Lead		Mercury		Nickel		Silver		Thallium		Zinc	
		Total	Total (ICP)	Dissolved	Dissolved (ICP)	Total	Dissolved	Total	Dissolved[b]	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
RG Drinking Water		**0.05[c]**				**5**		**50[c]**		**80**		**590**		**15**		**2**		**100**		**48**		**1.1**		**4,800**	
RG Surface Water		**0.14[a,c]**				**8**		**50[d]**		**50**		**2.5**		**5.8**		**0.025**		**7.9**		**1.2**		**1.6**		**77**	
MW8-14	11/95	**5.1 W+**	NA	NA	NA	**22.4**	NA	NA	NA	**90**	NA	152 S	NA	**203 N**	NA	0.52	NA	**100**	NA	(-)	NA	(-)	NA	241	NA
	05/96	NA	NA	NA	**3.3 B**	NA	**10.9**	NA	NA	(-)	NA	NA	6.7 B	NA	NA	NA	NA	NA	(-)	NA	NA	NA	(-)	NA	29.9
	09/96	NA	NA	**3.1 BW**	NA	NA	**19.9**	(-)	NA	(-)	NA	NA	(-)	NA	NA	NA	NA	NA	(-)	NA	8.6 B	NA	NA	NA	(-)
	05/97	NA	NA	**2.8 NW**	NA	NA	**9.8**	NA	(-)	NA	(-)	NA	2.0 U	NA	(-)	NA	0.20 UN *	NA	5.0 U	NA	7.3 N	NA	10.0 UN *	NA	(-)
	10/97	NA	NA	**1.0 BNW**	NA	NA	3.2	NA	(-)	NA	NA	NA	(-)	NA	(-)	NA	0.48	NA	11.0 U *	NA	2.0 B	NA	1.8 UBN *	NA	(-)
	05/98	NA	NA	**0.86 BW**	NA	NA	**12.6**	NA	(-)	NA	NA	NA	(-)	NA	(-)	NA	0.10 U *	NA	4.8 B	NA	1.2 BN	NA	6.0 U *	NA	(-)
	10/98	NA	NA	**10.8**	NA	NA	**16.9 E**	NA	(-)	NA	NA	NA	(-)	NA	(-)	NA	0.15 B	NA	4 B	NA	1.0 U	NA	6.0 UW *	NA	(-)
	05/99	NA	NA	**2.2 B**	NA	NA	**10.5 N**	NA	(-)	NA	NA	NA	13.2	NA	(-)	NA	0.10 U *	NA	(-)	NA	2.2 U *	NA	10.0 UNW *	NA	(-)
	11/99	NA	NA	5 U *	NA	NA	**13**	NA	7	NA	NA	NA	10 U *	NA	2U	NA	0.2U *	NA	20 U *	NA	10 U *	NA	5 U	NA	10 U
	06/00	NA	NA	**2**	NA	NA	**13.8**	NA	14.4	NA	58.8 J	NA	1.22 J	NA	0.61	NA	0.10 U *	NA	3.71 J	NA	0.564	NA	0.01 U	NA	3.2
	06/01	NA	NA	**1.3 J**	NA	NA	**13.2**	NA	29.7	NA	NA	NA	1.16 J	NA	0.959	.0009 B		NA	2.4	NA	0.31	NA	0.007 B	NA	3 U
	06/02	NA	NA	**1.53 J**	NA	NA	**14.9 J**	NA	15.8	NA	NA	NA	1.70	NA	0.74 UJ	NA	0.10 U *	NA	4.63	NA	0.44 J	NA	0.007 J	NA	4
	06/03	NA	NA	**2.08 J**	NA	NA	**14.6**	NA	16.2 J	NA	NA	NA	1.53	NA	0.74	NA	0.10 U *	NA	4.71 J	NA	0.38	NA	0.006 B	NA	2.6
	06/04	NA	NA	**1.63**	NA	NA	**13.5**	NA	22.2	NA	NA	NA	1.37	NA	0.89	NA	0.06 U *	NA	5.61	NA	0.351	NA	0.007 B	NA	2.6
	06/05	NA	NA	**2**	NA	NA	**12.5**	NA	17.8	NA	NA	NA	1.65	NA	1.1	NA	0.1 U *	NA	6.9	NA	0.46	NA	0.01 U	NA	2.92
	06/06	NA	NA	**1.66**	NA	NA	**11.1**	NA	14.9	NA	NA	NA	1.13	NA	0.682	NA	0.2 U *	NA	5.17 J	NA	0.358	NA	0.02 U	NA	2.25
	06/07	NA	NA	**1.5 J**	NA	NA	**9.8**	NA	15.4	NA	NA	NA	2.9	NA	0.99	NA	0.2 U *	NA	5.5	NA	0.33	NA	0.02 U	NA	2.6
	05/08	NA	NA	**1.91**	NA	NA	**8.33**	NA	21	NA	NA	NA	1.38	NA	0.817	NA	0.2 U *	NA	5.21	NA	0.24	NA	0.012 B	NA	2.2
	06/09	NA	NA	**1.78 J**	NA	NA	**8.91**	NA	18.2	NA	NA	NA	1.76	NA	1.18	NA	0.2 U *	NA	5.08	NA	0.259 J	NA	0.005 J	NA	2.58
	06/10	NA	NA	**1.91**	NA	NA	**10.4**	NA	28.3	NA	NA	NA	1.42	NA	1.57 J	NA	0.2 U *	NA	4.89	NA	0.383	NA	0.02 UJ	NA	2.23
	07/11	NA	NA	**1.75**	NA	NA	**8.65**	NA	15.1	NA	NA	NA	1.87	NA	1.06	NA	0.2 U *	NA	5.42	NA	0.285	NA	0.02 UJ	NA	2.38
	06/12	NA	NA	**1.67**	NA	NA	**7.9**	NA	19.8	NA	NA	NA	1.29	NA	0.88	NA	0.2 U *	NA	4.42	NA	0.223	NA	0.039 J	NA	2.1
	06/13	NA	NA	**1.56**	NA	NA	**8.52**	NA	23.9	NA	NA	NA	1.29	NA	1.07	NA	0.2 U *	NA	4.25	NA	0.237	NA	0.02 UJ	NA	2.01
	06/14	NA	NA	**1.6**	NA	NA	**7.6**	NA	15.76	NA	NA	NA	1.91	NA	1.17	NA	0.00202	NA	4.35	NA	0.25	NA	0.02 UJ	NA	2.6
	06/15	NA	NA	**1.61 J**	NA	NA	**9.04**	NA	17.94	NA	NA	NA	1.76	NA	1.71	NA	0.00197	NA	5.19	NA	0.286	NA	0.011 J	NA	3.1
	06/16	NA	NA	**1.35**	NA	NA	**6.94**	NA	14.78	NA	NA	NA	1.83	NA	1.96	NA	0.00125	NA	4.64	NA	0.232	NA	0.008 J	NA	4.42
	06/17	NA	NA	**1.47**	NA	NA	**5.91**	NA	12.4	NA	NA	NA	1.39	NA	0.984	NA	NA	NA	4.37	NA	0.21	NA	NA	NA	2.41
	09/18	NA	NA	**1.61**	NA	NA	**10.1**	NA	31.2	NA	NA	NA	1.26	NA	1.45	NA	NA	NA	3.59	NA	0.305	NA	NA	NA	2.69
	06/19	NA	NA	**1.53**	NA	NA	**7.14 J**	NA	13.5	NA	NA	NA	1.25	NA	1.37	NA	NA	NA	5.08	NA	0.234	NA	NA	NA	2.43
MW8-15	11/95	(-)	NA	1.0 UN *	NA	(-)	(-)	NA	NA	(-)	NA	2.5 +	(-)	(-)	(-)	(-)	NA	(-)	9.3 +	(-)	3.0 UNW *	NS	(-)	(-)	35.6
	06/19	NA	NA	**0.23 J**	NA	NA	0.02 U	NA	0.28	NA	NA	NA	0.02 U	NA	0.025 UJ	NA	NA	NA	0.29	NA	0.020 U	NA	NA	NA	2.0 U
MW8-16	11/95	**2.3 +**	NA	NA	NA	(-)	NA	NA	NA	(-)	NA	(-)	NA	(-)	NA	0.16	NA	(-)	NA	(-)	NA	(-)	NA	(-)	NA
	05/96	NA	NA	NA	**2.8 B**	NA	(-)	NA	NA	(-)	NA	NA	(-)	NA	NA	NA	NA	NA	(-)	NA	NA	NA	**1.1 BNW**	NA	(-)
	09/96	NA	NA	**2.9 B**	NA	NA	(-)	(-)	NA	(-)	NA	NA	(-)	NA	NA	NA	NA	NA	(-)	NA	(-)	NA	NA	NA	(-)
	05/97	NA	NA	**2.3 N**	NA	NA	(-)	NA	(-)	NA	(-)	NA	2.0 U	NA	(-)	NA	0.20 UN *	NA	5.0 U	NA	4.0 UN *	NA	1.0 UNW	NA	(-)
	10/97	NA	NA	**1.4 BN**	NA	NA	(-)	NA	(-)	NA	NA	NA	(-)	NA	(-)	NA	0.10 U *	NA	11.0 U *	NA	1.0 U	NA	1.8 UN *	NA	(-)
	05/98	NA	NA	**1.2 B**	NA	NA	(-)	NA	(-)	NA	NA	NA	(-)	NA	(-)	NA	0.10 U *	NA	5.7 B	NA	1.0 UN	NA	1.2 U *	NA	(-)
	10/98	NA	NA	1.8 U *	NA	NA	(-)	NA	(-)	NA	NA	NA	(-)	NA	(-)	NA	0.10 U *	NA	(-)	NA	1.0 U	NA	1.2 U *	NA	(-)
	05/99	NA	NA	1.7 U *	NA	NA	(-)	NA	(-)	NA	NA	NA	(-)	NA	3.4 N	NA	0.11 B	NA	4,1 BN	NA	2.2 U *	NA	1.0 UNW	NA	(-)
	11/99	NA	NA	5 U *	NA	NA	4 U	NA	5U	NA	NA	NA	10 U *	NA	2 U	NA	0.2 U *	NA	20 U *	NA	10 U *	NA	5 U *	NA	10 U
	06/00	NA	NA	**1.14 J**	NA	NA	0.16	NA	.17 U	NA	4.0 U	NA	0.20 J	NA	7 U *	NA	0.10 U *	NA	1.02 J	NA	0.020 B	NA	0.03 U	NA	4
	06/01	NA	NA	**1.5 J**	NA	NA	0.21	NA	0.45	NA	NA	NA	0.2 R	NA	0.04 U	.0003 B	NA	NA	1.4	NA	0.07 U	NA	0.005 U	NA	36.5
	06/02	NA	NA	**1.82 J**	NA	NA	0.065 J	NA	0.04 U	NA	NA	NA	0.20	NA	0.011 UJ	NA	0.10 U *	NA	2.59	NA	0.001 J	NA	0.002 J	NA	1.7
	06/03	NA	NA	**2.37 J**	NA	NA	0.42	NA	1.0 UJ	NA	NA	NA	0.10 U	NA	0.10 U	NA	0.10 U *	NA	9.34 J	NA	0.04 U	NA	0.02 U	NA	2.3 B
	06/04	NA	NA	**2.75**	NA	NA	0.055	NA	0.04 U	NA	NA	NA	0.38	NA	0.011 B	NA	0.04 U *	NA	3.76	NA	0.005 U	NA	0.001 U	NA	1.07
	06/05	NA	NA	**3**	NA	NA	2 U	NA	5 U	NA	NA	NA	2	NA	2 U	NA	0.1 U *	NA	10 U *	NA	3 U *	NA	1 U	NA	6 U
	06/06	NA	NA	**2.44**	NA	NA	0.186	NA	0.2 U	NA	NA	NA	0.043 B	NA	0.02 U	NA	0.2 U *	NA	3.61 J	NA	0.028	NA	0.02 U	NA	1.15
	06/07	NA	NA	**2.3 J**	NA	NA	0.098	NA	1	NA	NA	NA	0.77	NA	0.075	NA	0.2 U *	NA	2.7	NA	0.02 U	NA	0.02 U	NA	1
	05/08	NA	NA	**3.61**	NA	NA	0.125	NA	0.41	NA	NA	NA	0.043 B	NA	0.044 U	NA	0.2 U *	NA	0.64	NA	0.01 B	NA	0.002 U	NA	0.36 B
	06/09	NA	NA	**3.50 J**	NA	NA	0.013 J	NA	0.10 J	NA	NA	NA	0.156	NA	0.020 U	NA	0.2 U *	NA	0.42	NA	0.004 J	NA	0.02 U	NA	0.10 J
	06/10	NA	NA	**1.52**	NA	NA	0.022 UJ	NA	0.06 J	NA	NA	NA	0.1 UJ	NA	0.02 UJ	NA	0.2 U *	NA	1	NA	0.005 J	NA	0.02 UJ	NA	0.21 J
	07/11	NA	NA	**4.1**	NA	NA	0.059	NA	0.29	NA	NA	NA	0.72	NA	0.02 UJ	NA	0.2 U *	NA	0.65	NA	0.02 UJ	NA	0.02 U	NA	0.46 J
	06/12	NA	NA	**2.04**	NA	NA	0.027	NA	0.33	NA	NA	NA	0.295	NA	0.009 J	NA	0.2 U *	NA	0.35	NA	0.015 J	NA	0.02 UJ	NA	0.5 UJ
	06/13	NA	NA	**4.19**	NA	NA	0.037	NA	2.49	NA	NA	NA	0.5	NA	0.042	NA	0.2 U *	NA	0.68	NA	0.053	NA	0.02 U	NA	1.25
	06/14	NA	NA	**3.9**	NA	NA	0.013 J	NA	1.11	NA	NA	NA	1.06 J	NA	0.054	NA	0.00289	NA	0.31	NA	0.022 UJ	NA	0.02 U	NA	0.84
	06/15	NA	NA	**2.6**	NA	NA	0.022	NA	0.42	NA	NA	NA	0.66	NA	0.046	NA	0.00218	NA	0.26	NA	0.02 UJ	NA	0.02 UJ	NA	0.99
	06/16	NA	NA	**2.14**	NA	NA	0.074	NA	0.2 UJ	NA	NA	NA	0.1 UJ	NA	0.02 UJ	NA	0.00034 B	NA	1.93	NA	0.02 UJ	NA	0.007 J	NA	0.76
	06/17	NA	NA	**2.17**	NA	NA	0.006 J	NA	1.01	NA	NA	NA	0.1 UJ	NA	0.016 J	NA	NA	NA	4.45	NA	0.008 J	NA	NA	NA	0.5
	09/18	NA	NA	**2.39**	NA	NA	0.02 UJ	NA	1.86	NA	NA	NA	0.06 J	NA	0.05 U	NA	NA	NA	4.1	NA	0.02 U	NA	NA	NA	0.52
	06/19	NA	NA	**2.21**	NA	NA	0.02 U	NA	0.51	NA	NA	NA	0.1 U	NA	0.05 U	NA	NA	NA	5.85	NA	0.02 U	NA	NA	NA	0.22

Table G-4. Summary of Inorganics Detected in Groundwater and Seeps at OU 2 Area 8 Exceeding One-Half of the MTCA Method B Cleanup Levels (1995-2019)

Location	Sampling Date	Analyte Concentration (µg/L)																					
		Arsenic				Cadmium		Total Chromium		Chromium VI		Copper		Lead		Mercury		Nickel		Silver		Thallium		Zinc	
		Total	Total (ICP)	Dissolved	Dissolved (ICP)	Total	Dissolved	Total	Dissolved[b]	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
RG Drinking Water		**0.05[c]**				**5**		**50[c]**		**80**		**590**		**15**		**2**		**100**		**48**		**1.1**		**4,800**	
RG Surface Water		**0.14[a,e]**				**8**		**50[d]**		**50**		**2.5**		**5.8**		**0.025**		**7.9**		**1.2**		**1.6**		**77**	
MW8-17	11/95	**3.0 N**	NA	NA	NA	(-)	NA	NA	NA	(-)	NA	26.7 S+	NA	(-)	NA	0.11	NA	35.2 +	NA	(-)	NA	NA	(-)	(-)	NA
MW8-18	11/95	**1.8 N**	NA	**1.2 N**	NA	(-)	(-)	NA	NA	(-)	NA	3.8 +	(-)	(-)	(-)	(-)	NA	16.0 +	9.0 +	(-)	3.0 UNW *	NA	(-)	(-)	(-)
MW8-19	11/95	**3.3 NW**	NA	**1.9 N**	NA	(-)	(-)	NA	NA	(-)	NA	22.9 S+	1.3 +	3.2	NA	(-)	NA	25.7 +	9.0 U + *	(-)	3.0 UNW *	NA	(-)	(-)	(-)
MW8-20	11/95	(-)	NA	NA	NA	(-)	NA	NA	NA	(-)	NA	7.9 +	NA	(-)	NA	(-)	NA	18.6 +	NA	(-)	NA	NA	(-)	(-)	NA
Seep A[f]	05/96	NA	NA	NA	1.3 B	46.7	33.9	183	159	240	NA	7.8 B	5.1 B	NA	NA	NA	NA	NA	(-)	NA	NA	NA	NA	NA	(-)
	05/97	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(-)	NA	NA
	06/00	NA	NA	2.4 J	NA	NA	0.14	NA	0.6	NA	NA	NA	0.27	NA	1.3 J	NA	NA	NA	5.59 J	NA	1.14 J	NA	0.02	NA	0.8
	06/01	NA	NA	0.9 J	NA	NA	23.2	NA	5.6	NA	NA	NA	1 J	NA	0.06	0.0034	NA	NA	1	NA	0.1	NA	0.022	NA	7.6 B
	06/02	NA	NA	1.95 J	NA	NA	2.57 J	NA	0.44 U	NA	NA	NA	0.80	NA	0.054 UJ	NA	0.10 U *	NA	0.95	NA	0.011 UJ	NA	0.003 J	NA	1.3
	06/03	NA	NA	1.29 J	NA	NA	38.3	NA	7.6 J	NA	NA	NA	0.89	NA	0.03	NA	0.10 U *	NA	1.22 J	NA	0.02	NA	0.012 B	NA	4.5 B
	06/04	NA	NA	0.66	NA	NA	88.9	NA	45.5	NA	NA	NA	1.08	NA	0.032	NA	0.06 U *	NA	4.29	NA	0.031	NA	0.015 B	NA	0.83
	06/05	NA	NA	1.7	NA	NA	50.3	NA	11	NA	NA	NA	1.13	NA	0.1 U	NA	0.1 U *	NA	2	NA	0.032 U	NA	0.014	NA	1.83
	06/06	NA	NA	1.21	NA	NA	14.4	NA	3.58	NA	NA	NA	0.814	NA	0.08 U	NA	0.2 U *	NA	1.74 J	NA	0.162	NA	0.02 U	NA	1.4
	06/07	NA	NA	1 J	NA	NA	19.4	NA	7.2	NA	NA	NA	1.2	NA	0.063	NA	0.2 U *	NA	1.5	NA	0.02 U	NA	0.02 U	NA	1.5
	05/08	NA	NA	2.48	NA	NA	7.96	NA	10.6	NA	NA	NA	0.867	NA	0.092 U	NA	0.2 U *	NA	1.77	NA	0.037	NA	0.01 B	NA	1.44
	06/09	NA	NA	1.50 J	NA	NA	2.57	NA	5.0	NA	NA	NA	0.383	NA	0.028	NA	0.2 U *	NA	1.18	NA	0.013 J	NA	0.003 J	NA	1.00
	06/10	NA	NA	1.66	NA	NA	6.6	NA	4.87	NA	NA	NA	0.517	NA	0.042 UJ	NA	0.2 U *	NA	1.94	NA	0.03	NA	0.02 UJ	NA	2.58
	07/11	NA	NA	1.19	NA	NA	1.08	NA	3.59	NA	NA	NA	0.651	NA	0.036	NA	0.2 U *	NA	1.58	NA	0.02 UJ	NA	0.02 UJ	NA	0.6
	06/12	NA	NA	0.98	NA	NA	15.4	NA	7.52	NA	NA	NA	0.468	NA	0.047	NA	0.2 U *	NA	2.99	NA	0.107	NA	0.026 UJ	NA	1.21
	06/13	NA	NA	1.27	NA	NA	0.848	NA	4.32	NA	NA	NA	0.435	NA	0.016 J	NA	0.2 U *	NA	1.03 UJ	NA	0.009 J	NA	0.02 UJ	NA	0.68
	06/14	NA	NA	1.1	NA	NA	2.9	NA	7.3	NA	NA	NA	0.511	NA	0.03	NA	0.00162	NA	1.97	NA	0.02 UJ	NA	0.02 UJ	NA	0.8
	06/15	NA	NA	0.99 J	NA	NA	0.729	NA	1.37	NA	NA	NA	0.38	NA	0.047	NA	0.00506	NA	1.05	NA	0.011 J	NA	0.006 J	NA	2.3
	06/16	NA	NA	0.89	NA	NA	10.5	NA	3.22	NA	NA	NA	0.372	NA	0.053 UJ	NA	0.00134	NA	6.83	NA	0.057	NA	0.008 J	NA	0.62
	06/17	NA	NA	0.93	NA	NA	10.5	NA	6.14	NA	NA	NA	0.42	NA	0.034	NA	NA	NA	6.78	NA	0.039	NA	NA	NA	0.87
Seep B[f]	05/96	NA	3.0 B	NA	4.6 B	(-)	(-)	NA	NA	(-)	NA	24.5 B	8.5 B	NA	NA	NA	NA	NA	(-)	NA	NA	NA	NA	NA	(-)
	05/97	NA	NA	NA	NA	NA	NS	NA	NS	NA	NA	NA	NS	NA	NA	NA	NA	NA	NS	NA	NA	NA	(-)	NA	NA
	06/00	NA	NA	2.5 J	NA	NA	0.82	NA	6.4	NA	NA	NA	0.76	NA	.22 J	NA	NA	NA	.83 J	NA	0.297 J	NA	0.01 U	NA	1.4
	06/01	NA	NA	1.4 J	NA	NA	1.52	NA	4.4	NA	NA	NA	0.8 J	NA	0.04 U	.0009 B	NA	NA	1	NA	0.1 U	NA	0.011 B	NA	3.4 U
	06/02	NA	NA	1.29 J	NA	NA	2.23 J	NA	3.54	NA	NA	NA	0.90	NA	0.024 UJ	NA	0.10 U *	NA	1.95	NA	0.049 J	NA	0.011 J	NA	1.9
	06/03	NA	NA	1.33 J	NA	NA	4.18	NA	2.9 J	NA	NA	NA	0.76	NA	0.02 U	NA	0.10 U *	NA	1.26 J	NA	0.09	NA	0.013 B	NA	9.0 B
	06/04	NA	NA	1.02	NA	NA	8.33	NA	15.9	NA	NA	NA	0.71	NA	0.27	NA	0.06 U *	NA	4.31	NA	0.097	NA	0.017 B	NA	0.97
	06/05	NA	NA	1.43	NA	NA	2.06	NA	6.52	NA	NA	NA	0.89	NA	0.1 U	NA	0.1 U *	NA	2.77	NA	0.035	NA	0.01 U	NA	1.12
	06/06	NA	NA	1.32	NA	NA	2.1	NA	3.33	NA	NA	NA	0.602	NA	0.022	NA	0.2 U *	NA	2.64 J	NA	0.085	NA	0.02 U	NA	1.01
	06/07	NA	NA	1.1 J	NA	NA	1.1	NA	2.7	NA	NA	NA	0.6	NA	0.058	NA	0.2 U *	NA	1.8	NA	0.02 U	NA	0.02 U	NA	0.96
	05/08	NA	NA	2.27	NA	NA	1.26	NA	3.28	NA	NA	NA	0.668	NA	0.18 U	NA	0.2 U *	NA	2.11	NA	0.051	NA	0.019 B	NA	1.39
	06/09	NA	NA	1.26 J	NA	NA	0.616	NA	3.19	NA	NA	NA	0.618	NA	0.058	NA	0.2 U *	NA	1.10	NA	0.009 J	NA	0.004 J	NA	0.73
	06/10	NA	NA	1.4	NA	NA	0.928	NA	3.7	NA	NA	NA	0.646	NA	0.02 UJ	NA	0.2 U *	NA	1.46	NA	0.202	NA	0.02 UJ	NA	2.31
	07/11	NA	NA	1.17	NA	NA	1.05	NA	3.53	NA	NA	NA	0.69	NA	0.025	NA	0.2 U *	NA	1.61	NA	0.024 UJ	NA	0.018 J	NA	0.68
Seep C	09/18	NA	NA	1.18	NA	NA	20.8	NA	5.51	NA	NA	NA	0.92	NA	0.209 UJ	NA	NA	NA	1.58	NA	0.018 J	NA	NA	NA	2.25
	06/19	NA	NA	1.3	NA	NA	0.726	NA	4.36	NA	NA	NA	0.7	NA	0.050 U	NA	NA	NA	1.26	NA	0.007 J	NA	NA	NA	0.50 U

[a]Value listed is the lower of the cancer or noncancer value.
[b]Results are less than the results reported for chromium (VI) because of variation in analytical methods. Variance in results for these analytes is common.
[c]Value is for total chromium. Chromium (VI) is 80 µg/L.
[d]50 µg/L is for chromium (VI). There is no goal for total chromium.
[e]The background concentration of arsenic in groundwater at the site is 12 µg/L.
[f]Seeps are only compared to surface water RGs.

Notes:
Data from 1995 to 2004 are from U.S. Navy 2005a, from 2005 to 2008 are from U.S. Navy 2008e, from 2009 are from U.S. Navy 2009d, and from 2010 through 2014 are from U.S. Navy 2014b (updated some values based on Naval Installation Restoration Information Solution download).
Shaded row indicates data evaluated in this 5-year review period.
Bolded value indicates it exceeds or is equal to the RG for drinking water.
Yellow highlighte value exceeds or is equal to the surface water RG.
* - The reporting limit exceeds the RG.
(-) - undetected above one-half of the MTCA Method B cleanup levels
+ - Duplicate analysis is not within control limits.
B - between instrument detection limit and contract required detection limit
J - The result is an estimated concentration that is less than the MRL, but greater than or equal to the MDL.
MDL - method detection limit
µg/L - microgram per liter
MRL - method reporting limit
MTCA - Model Toxics Control Act
N - Spiked sample is outside of control limits.
NA - not analyzed
RG - remediation goal
S - determined by method of standard additions
W - Post-digestion spike for furnace atomic absorption spectrophotometric analysis is out of control limits (85 to 115%), and sample is less than 50% of spike absorbance.
U - The compound was analyzed for, but was not detected ("nondetect") at or above the MRL/MDL.

Table G-5. PFAS Results for Area 8 Groundwater Sampling Locations, 2018 and 2019

Well Identification	MW8-8	MW8-8	MW8-9	MW8-9	MW8-11	MW8-11	MW8-11 (Dup)	MW8-11 (Dup)	MW8-12	MW8-12	MW8-14	MW8-14	MW8-15	MW8-15	MW8-16	MW8-16	Field Blank	Field Blank	Field Blank
	AREA-8-18-200	AREA-8-19-200	AREA-8-18-201	AREA-8-19-201	AREA-8-18-202	AREA-8-19-202	AREA-8-18-203	AREA-8-19-203	AREA-8-18-204	AREA-8-19-204	AREA-8-18-205	AREA-8-19-205	AREA-8-18-207	AREA-8-19-207	AREA-8-18-206	AREA-8-19-206	AREA-8-18-210	AREA-8-19-212	AREA-8-19-213
Sample Date	09/17/18	06/10/19	09/17/18	06/11/19	09/18/18	06/25/19	09/18/18	06/25/19	09/17/18	06/10/19	09/18/18	06/25/19	09/18/18	06/10/19	09/17/18	06/11/19	09/17/18	06/10/19	06/25/19
Units	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L
Analyte																			
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	19 U	21 U	19 U M	20 U	19 U	18 U M	19 U	18 U	18 U	20 U	19 U	18 U	19 U	20 U	19 U	20 U	18 U	20 U	18 U
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	19 U	21 U	19 U	20 U	19 U	18 U	19 U M	18 U	18 U	20 U	19 U M	18 U	19 U	20 U	19 U	20 U	18 U M	20 U	18 U M
Perfluorobutanesulfonic acid (PFBS)	**4.7**	**4.8**	**0.79 J M**	**0.76 J M**	**1.2 J M**	**1.1 J M**	**1.3 J**	**0.93 J M**	**4.5**	**3.6**	1.9 U M	1.8 U M	1.9 U	2.0 U	**0.77 J M**	**0.74 J**	1.8 U	2.0 U M	1.8 U
Perfluorodecanoic acid (PFDA)	**3.9**	**2.6**	1.9 U	2.0 U	**0.53 J**	**0.68 J**	**0.79 J M**	**0.66 J**	**2.7**	**1.5 J M**	1.9 U M	1.8 U	1.9 U	2.0 U	**0.75 J**	**0.76 J M**	1.8 U	2.0 U M	1.8 U
Perfluorododecanoic acid (PFDoA)	1.9 U	2.1 U	1.9 U	2.0 U	1.9 U	1.8 U	1.9 U	1.8 U	1.8 U	2.0 U	1.9 U	1.8 U	1.9 U	2.0 U	1.9 U	2.0 U	1.8 U	2.0 U	1.8 U
Perfluoroheptanoic acid (PFHpA)	**8.4**	**6.5 M**	**0.72 J**	**1.1 J M**	**3.5**	**3.0 M**	**3.4**	**2.6 M**	**7.7**	**4.7 M**	1.9 U	1.8 U	1.9 U	2.0 U M	**1.2 J**	**0.99 J M**	1.8 U	2.0 U M	1.8 U
Perfluorohexanesulfonic acid (PFHxS)	**2.6**	1.8 J M	4.6	**2.5 M**	**3.2**	**2.7 M**	**3.5**	**2.8 M**	**2.9**	**2.6 M**	**0.61 J M**	**0.60 J J1 M**	1.9 U	2.0 U M	**1.3 J M**	**1.3 J M**	1.8 U	2.0 U M	1.8 U M
Perfluorohexanoic acid (PFHxA)	**13**	**13**	**1.5 J M**	**2.4 M**	**3.5**	**3.3 M**	**3.5**	**3.3 M**	**13**	**11 M**	1.9 U M	**0.46 J**	1.9 U	2.0 U M	**1.8 J M**	**1.8 J M**	1.8 U	2.0 U	1.8 U
Perfluorononanoic acid (PFNA)	**3.7**	**2.8**	1.9 U M	2.0 U M	**1.0 J M**	**1.2 J**	**1.3 J**	**1.2 J M**	**3.7 M**	**2**	1.9 U J1 M	1.8 U	1.9 U	2.0 U	**0.60 J M**	**0.55 J M**	1.8 U	2.0 U M	1.8 U
Perfluorooctanesulfonic acid (PFOS)	**47**	**42**	**7.6**	**6.0 M**	**63**	**46**	**57**	**42**	**60**	**31**	**1.9 J M**	**1.7 J M**	3.8 U M	4.0 U M	**5.9**	**6.4 M**	3.5 U M	3.9 U M	3.6 U
Perfluorooctanoic acid (PFOA)	**17**	**13**	**1.7 J M**	**2.1 M**	**11**	**8.4 M**	**10 M**	**8.1 M**	**17 M**	**8.6 M**	**0.64 J M**	**0.62 J M**	1.9 U M	2.0 U	**2.4 M**	**2.4 M**	1.8 U M	2.0 U	1.8 U M
Perfluorotetradecanoic acid (PFTeA)	3.7 U	4.1 U	3.7 U	4.0 U	3.8 U M	3.5 U	3.8 U	3.5 U	3.6 U	4.1 U	3.7 U	3.5 U	3.8 U	4.0 U	3.8 U	4.0 U	3.5 U	3.9 U	1.8 U
Perfluorotridecanoic acid (PFTriA)	3.7 U	4.1 U	3.7 U	4.0 U	3.8 U	3.5 U	3.8 U	3.5 U	3.6 U	4.1 U	3.7 U	3.5 U	3.8 U	4.0 U	3.8 U	4.0 U	3.5 U	3.9 U	1.8 U
Perfluoroundecanoic acid (PFUnA)	1.9 U M	2.1 U M	1.9 U	2.0 U	1.9 U	1.8 U	1.9 U	1.8 U	1.8 U M	2.0 U	1.9 U J1	1.8 U M	1.9 U	2.0 U M	1.9 U	2.0 U M	1.8 U	2.0 U M	1.8 U
Total PFOS + PFOA	**64**	**55**	**9.3 J M**	**8.1 M**	**74**	**54.4 M**	**67 M**	**50.1 M**	**77 M**	**39.6 M**	**2.54 J M**	**2.32 J M**	5.7 U	6.0 U	**8.3**	**8.8**	5.3 U M	5.9 U M	5.4 U M
EPA Heath Advisory Level for PFOA, PFOS, or PFOA+PFOS	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**

Notes :

Bold indicates the analyte was detected in the groundwater sample.

Shading indicates detected value is equal to or exceeds EPA Health Advisory Level of 70 ng/L.

Dup – field duplicate

J – analyte was positively identified; but the result is estimated estimation

J1 – the result is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria

M – manual integrated compound

ng/L – nanograms per liter

U – not detected at value shown

Table G-6. Selected VOC Results for OU 2 Area 8 Surface Water, June 2019

Location ID	Sample ID	Sampling Date	TCE (µg/L)	PCE (µg/L)	1,1-DCE (µg/L)	cis-1,2-DCE (µg/L)	1,1,1-TCA (µg/L)
Surface Water Remediation Goals			**81**	**8.9**	**3.2**	**--**	**42,000**
Seep C	AREA-8-19-210	06/17/19	0.2 UJ M J1	0.5 UJ J1	0.2 UJ M J1	0.2 UJ M J1	0.2 UJ J1
Seep C (DUP)	AREA-8-19-211	06/17/19	0.2 UJ M	0.5 UJ	0.2 UJ M	0.2 UJ M	0.2 UJ M

Notes:

Shading indicates detected value is equal to or exceeds surface water RG.

µg/L – microgram(s) per liter

DCE – dichloroethene

DUP – field duplicate

J1 –the result is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria

M – manually integrated compound

PCE – tetrachloroethene

TCA – trichloroethane

TCE – trichloroethene

UJ – analyte not detected, but the reported quantitation/detection limit is estimated

Table G-7. Dissolved Metals Results for OU 2 Area 8 Surface Water, June 2019

Location ID	Sample ID	Sampling Date	Arsenic (µg/L)	Cadmium (µg/L)	Chromium (µg/L)	Copper (µg/L)	Lead (µg/L)	Nickel (µg/L)	Silver (µg/L)	Zinc (µg/L)
Surface Water Remediation Goals			**0.14**[1/]	**8**	**50**[2/]	**2.5**	**5.8**	**7.9**	**1.2**	**77**
Seep C	AREA-8-19-210	06/17/19	1.3	0.418	0.32	0.44	0.077 UJ	0.5	0.02 U	1.19
Seep C (DUP)	AREA-8-19-211	06/17/19	1.28	0.539	0.39	0.47	0.066 UJ	0.54	0.02 U	1.18

Notes:

[1/]The background concentration of arsenic in groundwater at the site is 12 µg/L.

[2/]The RG of 50 µg/L is for hexavalent chromium [Cr(VI)]. There is no RG established for total dissolved chromium.

All concentrations are dissolved (except where noted above) and in µg/L.

Shading indicates detected value is equal to or exceeds the surface water RG.

µg/L – microgram(s) per liter

DUP – field duplicate

U – analyte was not detected at or above the indicated practical quantitation limit

UJ – analyte not detected, but the reported quantitation/detection limit is estimated

Table G-8. Dissolved Metals for OU 2 Area 8 Sediment, June 2019

Location ID	Sample ID	Sampling Date	Arsenic (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Nickel (mg/kg)	Silver (mg/kg)	Zinc (mg/kg)
Sediment Cleanup Goal[1/]			**57**	**5.1**	**260**	**390**	**450.0**	**NE**	**6.1**	**410**
Seep C	AREA-8-19-250	06/19/19	1.9 D	**14 JD J1**	46 D J1	11 JD J1	4.3 D	22 JD J1	0.48 D	36 JD
Seep C (DUP)	AREA-8-19-251	06/19/19	2.0 JD	**13 JD**	46 JD	12 JD	5.3 D	21 JD	0.66 D	42 JD

Notes:

[1/]The sediment cleanup goals are equal to the Washington State SQS values.

Bold indicates detected value is equal to or exceeds the sediment cleanup goal.

mg/kg – milligram(s) per kilogram

D – result reported from a diluted analysis

DUP – field duplicate

J – analyte positively identified, but result is estimated

J1 – the result is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria

SQS – Sediment Quality Standard

Appendix H: OU 2 AREA 8 DATA COLLECTED DURING FYR PERIOD

Table H-1. Outdoor/Ambient Air Sampling Results

Analyte Name					Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl chloride
PAL Air - Indoor (µg/m³)					40	2	40	40	200	2.8
Location Name	Sample Name	Sample Type	Date Collected	Description	Result (µg/m³)	Result (µg/m³)	Result (µg/m³)	Result (µg/m³)	Result (µg/m³)	Result (µg/m³)
August 2023										
Area 8-OA1	Area 8-OA1-20230801	N	8/1/2023	Air - Outdoor	0.025 J	0.032 U	0.032 U	0.32	0.034 U	0.037 U
Area 8-OA2	Area 8-OA2-20230802	P	8/2/2023	Air - Outdoor	0.022 J	0.034 U	0.034 U	0.036 U	0.036 U	0.039 U
Area 8-OA2	FD-4-20230802	FD	8/2/2023	Air - Outdoor	0.018 J	0.033 U	0.033 U	0.02 J	0.034 U	0.037 U
January 2024										
Area 8-OA1	Area 8-OA1-20240109	N	1/9/2024	Air - Outdoor	0.03 J	0.032 U	0.032 U	0.021 J	0.033 U	0.036 U
Area 8-OA2	Area 8-OA2-20240110	P	1/10/2024	Air - Outdoor	0.025 J	0.032 U	0.032 U	4.2	0.033 U	0.036 U
Area 8-OA2	FD-4-20240110	FD	1/10/2024	Air - Outdoor	0.027 J	0.032 U	0.032 U	4.1	0.033 U	0.036 U

Notes:
August 2023 Samples:
FD-4 is FD of OA2

January 2024 Samples:
FD-4 is FD of OA2
J – The result is an estimated concentration that is less than the LOQ but greater than or equal to the MDL.

Acronyms/Abbreviations:
µg/m³ – micrograms per cubic meter
FD – Field Duplicate
N – Normal (no field duplicate)
NE – not established
P – Parent
U – Undetected at the limit of detection shown

Table H-2. Vapor Intrusion Sampling Results for Building 82

Analyte Name					Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl chloride
Project Action Limit Air - Indoor (µg/m³)					40	2	40	40	200	2.8
Project Action Limit Soil Gas - Sub-slab (µg/m³)					1330	66.7	1330	1330	6670	93.3
Location Name	Sample Name	Sample Type	Date Collected	Description	Result (µg/m³)	Result (µg/m³)	Result (µg/m³)	Result (µg/m³)	Result (µg/m³)	Result (µg/m³)
August 2023										
Area 8-B82-IA1	Area 8-B82-IA1-20230802	N	8/2/2023	Air - Indoor	23	0.25	0.033 U	0.97	0.034 U	0.037 U
Area 8-B82-SS1	Area 8-B82-SS1-20230802	N	8/2/2023	Soil Gas – Sub-slab	210	**4000**	7.7 U	21 J	7.7 U	7.7 U
				Air - Indoor- Corrected[a]	22.982	0.25	0.033 U	0.97	0.034 U	0.037 U
Area 8-B82-IA2	Area 8-B82-IA2-20230802	N	8/2/2023	Air - Indoor	0.92	0.11	0.032 U	0.64	0.034 U	0.037 U
Area 8-B82-SS2	Area 8-B82-SS2-20230802	N	8/2/2023	Soil Gas – Sub-slab	89	**280**	0.81 U	0.81 U	0.81 U	0.81 U
				Air - Indoor- Corrected[a]	0.902	0.11	0.032 U	0.62	0.034 U	0.037 U
Area 8-B82-IA3	Area 8-B82-IA3-20230802	P1	8/2/2023	Air - Indoor	0.71	0.037 J	0.032 U	1	0.033 U	0.036 U
Area 8-B82-IA3	FD-1-20230802	FD1	8/2/2023	Air - Indoor	0.68	0.037 J	0.032 U	1	0.033 U	0.036 U
Area 8-B82-SS3	Area 8-B82-SS3-20230802	N	8/2/2023	Soil Gas – Sub-slab	130	**2400**	4.3 U	4.3 U	4.3 U	4.3 U
				Air - Indoor- Corrected[a]	0.692	0.037 J	0.032 U	0.98	0.033 U	0.036 U
Area 8-B82-IA4	Area 8-B82-IA4-20230802	N	8/2/2023	Air - Indoor	0.37	0.026 J	0.032 U	2.6	0.033 U	0.036 U
Area 8-B82-SS4	Area 8-B82-SS4-20230802	P3	8/2/2023	Soil Gas – Sub-slab	0.79 J	2.2 J	0.83 U	1.6 J	0.83 U	0.83 U
Area 8-B82-SS4	FD-3-20230802	FD3	8/2/2023	Soil Gas – Sub-slab	0.74 U	3.5	0.74 U	0.36 J	0.74 U	0.74 U
				Air - Indoor- Corrected[a]	0.772	0.026 J	0.032 U	2.58	0.033 U	0.036 U
Area 8-B82-IA5	Area 8-B82-IA5-20230802	N	8/2/2023	Air - Indoor	0.29	0.21	0.033 U	3.7	0.035 U	0.038 U
Area 8-B82-SS5	Area 8-B82-SS5-20230802	N	8/2/2023	Soil Gas – Sub-slab	1.2 J	6.2	0.65 U	0.42 J	0.65 U	0.65 U
				Air - Indoor- Corrected[a]	0.272	0.21	0.033 U	3.68	0.035 U	0.038 U
Area 8-B82-IA6	Area 8-B82-IA6-20230802	N	8/2/2023	Air - Indoor	0.24	0.24	0.013 J	3.4	0.035 U	0.038 U
Area 8-B82-SS6	Area 8-B82-SS6-20230802	N	8/2/2023	Soil Gas – Sub-slab	1.4 J	**110**	0.79 U	1.5 J	0.79 U	0.79 U
				Air - Indoor- Corrected[a]	0.222	0.24	0.013 J	3.38	0.035 U	0.038 U
Area 8-B82-IA7	Area 8-B82-IA7-20230802	P2	8/2/2023	Air - Indoor	0.24	0.025 J	0.032 U	4	0.033 U	0.036 U
Area 8-B82-IA7	FD-2-20230802	FD2	8/2/2023	Air - Indoor	0.23	0.024 J	0.033 U	4	0.034 U	0.037 U
Area 8-B82-SS7	Area 8-B82-SS7-20230802	N	8/2/2023	Soil Gas – Sub-slab	1.4 J	**98**	0.82 U	1.9 J	0.82 U	0.82 U
				Air - Indoor- Corrected[a]	0.222	0.025 J	0.032 U	3.98	0.033 U	0.036 U
Area 8-OA2	Area 8-OA2-20230802	P4	8/2/2023	Air - Outdoor	0.022 J	0.034 U	0.034 U	0.036 U	0.036 U	0.039 U
FD-4	FD-4-20230802	FD4	8/2/2023	Air - Outdoor	0.018 J	0.033 U	0.033 U	0.02 J	0.034 U	0.037 U

Table H-2 (continued). Vapor Intrusion Sampling Results for Building 82

Analyte Name					Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl chloride
Project Action Limit Air - Indoor (µg/m³)					40	2	40	40	200	2.8
Project Action Limit Soil Gas - Sub-slab (µg/m³)					1330	66.7	1330	1330	6670	93.3
Location Name	**Sample Name**	**Sample Type**	**Date Collected**	**Description**	**Result (µg/m³)**	**Result (µg/m³)**	**Result (µg/m³)**	**Result (µg/m³)**	**Result (µg/m³)**	**Result (µg/m³)**
January 2024										
Area 8-B82-IA1	Area 8-B82-IA1-20240109	N	1/9/2024	Air - Indoor	12	0.42	0.015 J	6.3	0.033 U	0.036 U
Area 8-B82-SS1	Area 8-B82-SS1-20240109	P2	1/9/2024	Soil Gas – Sub-slab	290	**3700**	6.6 U	19 J	4.3 J	6.6 U
Area 8-B82-SS1	FD-2-20240109	FD2	1/9/2024	Soil Gas – Sub-slab	140	**1800**	3.2 U	10 J	1.8 J	3.2 U
				Air - Indoor- Corrected[(a)]	11.97	0.42	0.015 U	6.3	0.033 U	0.036 U
Area 8-B82-IA2	Area 8-B82-IA2-20240109	N	1/9/2024	Air - Indoor	0.45	0.19	0.029 U	2	0.031 U	0.033 U
Area 8-B82-SS2	Area 8-B82-SS2-20240109	N	1/9/2024	Soil Gas – Sub-slab	92	**390**	0.74 U	0.89 J	0.74 U	0.74 U
				Air - Indoor- Corrected[(a)]	0.42	0.19	0.029 U	1.979	0.031 U	0.033 U
Area 8-B82-IA3	Area 8-B82-IA3-20240109	N	1/9/2024	Air - Indoor	0.38	0.2	0.036 U	3	0.037 U	0.041 U
Area 8-B82-SS3	Area 8-B82-SS3-20240109	N	1/9/2024	Soil Gas – Sub-slab	27	**350**	0.7 U	3.3	0.7 U	0.7 U
				Air - Indoor- Corrected[(a)]	0.35	0.2	0.036 U	2.979	0.037 U	0.041 U
Area 8-B82-IA4	Area 8-B82-IA4-20240109	N	1/9/2024	Air - Indoor	0.29	0.14	0.041 U	3.1	0.043 U	0.047 U
Area 8-B82-SS4	Area 8-B82-SS4-20240109	N	1/9/2024	Soil Gas – Sub-slab	0.43	1.1 J	0.79 U	3.1	0.79 U	0.79 U
				Air - Indoor- Corrected[(a)]	0.4	0.14	0.041 U	3.079	0.043 U	0.047 U
Area 8-B82-IA5	Area 8-B82-IA5-20240109	N	1/9/2024	Air - Indoor	0.21	0.19	0.033 U	3.3	0.035 U	0.038 U
Area 8-B82-SS5	Area 8-B82-SS5-20240109	N	1/9/2024	Soil Gas – Sub-slab	0.64 J	8.2	0.75 U	0.45 J	0.75 U	0.75 U
				Air - Indoor- Corrected[(a)]	0.18	0.19	0.033 U	3.279	0.035 U	0.038 U
Area 8-B82-IA6	Area 8-B82-IA6-20240109	P1	1/9/2024	Air - Indoor	0.25	0.24	0.028 U	3	0.029 U	0.032 U
Area 8-B82-IA6	FD-1-20240109	FD1	1/9/2024	Air - Indoor	0.23	0.27	0.032 U	3.3	0.033 U	0.036 U
Area 8-B82-SS6	Area 8-B82-SS6-20240109	N	1/9/2024	Soil Gas – Sub-slab	0.61 J	37	0.59 U	0.27 J	0.59 U	0.59 U
				Air - Indoor- Corrected[(a)]	0.22	0.24	0.028 U	2.979	0.029 U	0.032 U
Area 8-B82-IA7	Area 8-B82-IA7-20240109	N	1/9/2024	Air - Indoor	0.3	0.18	0.026 U	3.2	0.028 U	0.03 U
Area 8-B82-SS7	Area 8-B82-SS7-20240109	N	1/9/2024	Soil Gas – Sub-slab	36	**200**	0.77 U	0.54 J	0.77 U	0.77 U
				Air - Indoor- Corrected[(a)]	0.27	0.18 J	0.026 U	3.179	0.028 U	0.03 U
Area 8-OA1	Area 8-OA1-20240109	N	1/9/2024	Air - Outdoor	0.03 J	0.032 U	0.032 U	0.021 J	0.033 U	0.036 U

Notes:
Blue shading indicates corrected indoor air results.
Orange shading indicates outdoor air samples.
Bold – exceeds PAL.
(a) Indoor Air Corrections were calculated as described in Section 2.7.
Acronyms/Abbreviations:
µg/m³ – micrograms per cubic meter
FD – Field Duplicate
J – estimated below the reporting limit.
N – Normal (no field duplicate)
NE – not established
P – Parent; U – Undetected at the limit of detection shown

Table H-3. Relative Concentrations of Detected Compounds at Building 82

Location Name	Sample Name	Type	Date	Description	PCE	TCE	cDCE	tDCE	1,1-DCE	VC
August 2023 Sampling Event										
Area 8-B82-IA1	Area 8-B82-IA1-20230802	N	8/2/2023	Air – Indoor	94.6%	1.0%	0.1%	4.0%	0.1%	0.2%
Area 8-B82-SS1	Area 8-B82-SS1-20230802	N	8/2/2023	Soil Gas – Sub-slab	4.9%	94.0%	0.2%	0.5%	0.2%	0.2%
Area 8-B82-IA2	Area 8-B82-IA2-20230802	N	8/2/2023	Air – Indoor	51.9%	6.2%	1.8%	36.1%	1.9%	2.1%
Area 8-B82-SS2	Area 8-B82-SS2-20230802	N	8/2/2023	Soil Gas – Sub-slab	23.9%	75.2%	0.2%	0.2%	0.2%	0.2%
Area 8-B82-IA3	Area 8-B82-IA3-20230802	P1	8/2/2023	Air – Indoor	38.4%	2.0%	1.7%	54.1%	1.8%	1.9%
Area 8-B82-IA3	FD-1-20230802	FD1	8/2/2023	Air – Indoor	37.4%	2.0%	1.8%	55.0%	1.8%	2.0%
Area 8-B82-SS3	Area 8-B82-SS3-20230802	N	8/2/2023	Soil Gas – Sub-slab	5.1%	94.2%	0.2%	0.2%	0.2%	0.2%
Area 8-B82-IA4	Area 8-B82-IA4-20230802	N	8/2/2023	Air – Indoor	11.9%	0.8%	1.0%	84.0%	1.1%	1.2%
Area 8-B82-SS4	Area 8-B82-SS4-20230802	P3	8/2/2023	Soil Gas – Sub-slab	11.2%	31.1%	11.7%	22.6%	11.7%	11.7%
Area 8-B82-SS4	FD-3-20230802	FD3	8/2/2023	Soil Gas – Sub-slab	10.9%	51.3%	10.9%	5.3%	10.9%	10.9%
Area 8-B82-IA5	Area 8-B82-IA5-20230802	N	8/2/2023	Air – Indoor	6.7%	4.9%	0.8%	85.9%	0.8%	0.9%
Area 8-B82-SS5	Area 8-B82-SS5-20230802	N	8/2/2023	Soil Gas – Sub-slab	12.3%	63.5%	6.7%	4.3%	6.7%	6.7%
Area 8-B82-IA6	Area 8-B82-IA6-20230802	N	8/2/2023	Air – Indoor	6.1%	6.1%	0.3%	85.7%	0.9%	1.0%
Area 8-B82-SS6	Area 8-B82-SS6-20230802	N	8/2/2023	Soil Gas – Sub-slab	1.2%	95.4%	0.7%	1.3%	0.7%	0.7%
Area 8-B82-IA7	Area 8-B82-IA7-20230802	P2	8/2/2023	Air – Indoor	5.5%	0.6%	0.7%	91.6%	0.8%	0.8%
Area 8-B82-IA7	FD-2-20230802	FD2	8/2/2023	Air – Indoor	5.3%	0.6%	0.8%	91.8%	0.8%	0.8%
Area 8-B82-SS7	Area 8-B82-SS7-20230802	N	8/2/2023	Soil Gas – Sub-slab	1.3%	94.4%	0.8%	1.8%	0.8%	0.8%
Area 8-OA2	Area 8-OA2-20230802	P4	8/2/2023	Air – Outdoor	10.9%	16.9%	16.9%	17.9%	17.9%	19.4%
FD-4	FD-4-20230802	FD4	8/2/2023	Air – Outdoor	10.3%	18.9%	18.9%	11.4%	19.4%	21.1%

Table H-3 (continued). Relative Concentrations of Detected Compounds at Building

Location Name	Sample Name	Type	Date	Description	PCE	TCE	cDCE	tDCE	1,1-DCE	VC
January 2024 Sampling Event										
Area 8-B82-IA1	Area 8-B82-IA1-20240109	N	1/9/2024	Air – Indoor	63.8%	2.2%	0.1%	33.5%	0.2%	0.2%
Area 8-B82-SS1	Area 8-B82-SS1-20240109	P2	1/9/2024	Soil Gas – Sub-slab	7.2%	91.9%	0.2%	0.5%	0.1%	0.2%
Area 8-B82-SS1	FD-2-20240109	FD2	1/9/2024	Soil Gas – Sub-slab	7.1%	91.9%	0.2%	0.5%	0.1%	0.2%
Area 8-B82-IA2	Area 8-B82-IA2-20240109	N	1/9/2024	Air – Indoor	16.5%	7.0%	1.1%	73.2%	1.1%	1.2%
Area 8-B82-SS2	Area 8-B82-SS2-20240109	N	1/9/2024	Soil Gas – Sub-slab	19.0%	80.4%	0.2%	0.2%	0.2%	0.2%
Area 8-B82-IA3	Area 8-B82-IA3-20240109	N	1/9/2024	Air – Indoor	10.3%	5.4%	1.0%	81.2%	1.0%	1.1%
Area 8-B82-SS3	Area 8-B82-SS3-20240109	N	1/9/2024	Soil Gas – Sub-slab	7.1%	91.5%	0.2%	0.9%	0.2%	0.2%
Area 8-B82-IA4	Area 8-B82-IA4-20240109	N	1/9/2024	Air – Indoor	7.9%	3.8%	1.1%	84.7%	1.2%	1.3%
Area 8-B82-SS4	Area 8-B82-SS4-20240109	N	1/9/2024	Soil Gas – Sub-slab	6.1%	15.7%	11.3%	44.3%	11.3%	11.3%
Area 8-B82-IA5	Area 8-B82-IA5-20240109	N	1/9/2024	Air – Indoor	5.5%	5.0%	0.9%	86.7%	0.9%	1.0%
Area 8-B82-SS5	Area 8-B82-SS5-20240109	N	1/9/2024	Soil Gas – Sub-slab	5.5%	71.1%	6.5%	3.9%	6.5%	6.5%
Area 8-B82-IA6	Area 8-B82-IA6-20240109	P1	1/9/2024	Air – Indoor	7.0%	6.7%	0.8%	83.8%	0.8%	0.9%
Area 8-B82-IA6	FD-1-20240109	FD1	1/9/2024	Air – Indoor	5.9%	6.9%	0.8%	84.6%	0.8%	0.9%
Area 8-B82-SS6	Area 8-B82-SS6-20240109	N	1/9/2024	Soil Gas – Sub-slab	1.5%	93.3%	1.5%	0.7%	1.5%	1.5%
Area 8-B82-IA7	Area 8-B82-IA7-20240109	N	1/9/2024	Air – Indoor	8.0%	4.8%	0.7%	85.0%	0.7%	0.8%
Area 8-B82-SS7	Area 8-B82-SS7-20240109	N	1/9/2024	Soil Gas – Sub-slab	15.1%	83.7%	0.3%	0.2%	0.3%	0.3%
Area 8-OA1	Area 8-OA1-20240109	N	1/9/2024	Air – Outdoor	16.3%	17.4%	17.4%	11.4%	17.9%	19.6%

Notes:

Blue shading indicates relative percent is less than 5%

Green shading indicates relative percent is 5% and 25%

Yellow shading indicates relative percent is between 25% and 50%

Orange shading indicates relative percent is between 50% and 75%

Red shading indicates relative percent greater than 75%

Table H-3 (continued). Relative Concentrations of Detected Compounds at Building

Acronyms/Abbreviations:
% – percent
1,1-DCE – 1,1-dichloroethene
cDCE – cis-1,2-dichloroethene
FD – field duplicate
IA – indoor air
N – normal sample
OA – outdoor air
P – parent sample
PCE – tetrachloroethene
SS – sub-slab vapor
TCE – trichloroethene
tDCE – trans-1,2-dichloroethene
VC – vinyl chloride

Table H-4. RPD between 2019 and 2023/2024 Analytical Results

Sample Type	Sub-Slab Vapor		Indoor Air	
Season	Summer	Winter	Summer	Winter
Location Name	Result		Result	
Tetrachloroethene				
B82-IA/SS-1	**-56%**	**-29%**	**8746%**	**233%**
B82-IA/SS-2	**-58%**	**-34%**	**667%**	**41%**
B82-IA/SS-3	**-66%**	**-92%**	**766%**	**41%**
B82-IA/SS-4	**-54%**	**13%**	**598%**	**16%**
B82-IA/SS-5	**-98%**	**-22%**	**504%**	**62%**
B82-IA/SS-6	**-36%**	**-76%**	**411%**	**127%**
B82-IA/SS-7	**-18%**	**3173%**	**193%**	**50%**
B98-IA/SS-1	**-56%**	**173%**	**-3%**	**-87%**
B98-IA/SS-2	**-48%**	**-40%**	**-14%**	**-85%**
B98-IA/SS-3	**-59%**	**291%**	**-19%**	**-2%**
B98-IA/SS-4	**-70%**	**123%**	**13%**	**-88%**
B98-IA/SS-5	**134%**	**218%**	**-92%**	**-22%**
B98-IA/SS-6	**-76%**	**158%**	**-48%**	**-67%**
B98-IA/SS-7	**-96%**	**34%**	**-66%**	**-93%**
B98-IA/SS-8	**-65%**	**-37%**	**-88%**	**-15%**
B98-IA/SS-9	**-6%**	**-46%**	**-36%**	**0%**
B98-IA/SS-10	**-60%**	**-26%**	-41%	**-94%**
B98-IA/SS-11	**-65%**	**12%**	**-32%**	**-94%**
B98-IA/SS-12	**-84%**	**-33%**	**30%**	**-76%**
B98-IA-13	NA	NA	**32%**	**-43%**

Table H-4 (continued). RPD between 2019 and 2023/2024 Analytical

Sample Type	Sub-Slab Vapor		Indoor Air	
Season	Summer	Winter	Summer	Winter
Location Name	Result		Result	
Trichloroethene				
B82-IA/SS-1	-9%	3%	47%	-68%
B82-IA/SS-2	-22%	50%	77%	-39%
B82-IA/SS-3	-11%	-89%	-54%	-23%
B82-IA/SS-4	-51%	-90%	-4%	-42%
B82-IA/SS-5	-79%	134%	17%	-61%
B82-IA/SS-6	-27%	-69%	-4%	-64%
B82-IA/SS-7	-30%	106%	-56%	-5%
B98-IA/SS-1	-42%	147%	120%	-69%
B98-IA/SS-2	-45%	20%	-48%	-65%
B98-IA/SS-3	-6%	272%	8%	-17%
B98-IA/SS-4	-55%	-27%	33%	-74%
B98-IA/SS-5	-18%	10%	47%	-59%
B98-IA/SS-6	-58%	367%	-79%	-77%
B98-IA/SS-7	-88%	-66%	-79%	-88%
B98-IA/SS-8	-42%	-47%	-87%	-27%
B98-IA/SS-9	100%	70%	-49%	-17%
B98-IA/SS-10	-35%	-27%	-73%	-79%
B98-IA/SS-11	-38%	-33%	-72%	-82%
B98-IA/SS-12	-68%	15%	0%	-84%
B98-IA-13	NA	NA	335%	-26%

Table H-4 (continued). RPD between 2019 and 2023/2024 Analytical

Sample Type	Sub-Slab Vapor		Indoor Air	
Season	Summer	Winter	Summer	Winter
Location Name	Result		Result	
cis-1,2-Dichloroethene				
B82-IA/SS-1	175%	965%	-41%	**15%**
B82-IA/SS-2	23%	155%	-90%	107%
B82-IA/SS-3	79%	-25%	-90%	177%
B82-IA/SS-4	12%	76%	-90%	193%
B82-IA/SS-5	-64%	134%	-94%	136%
B82-IA/SS-6	5%	97%	**-98%**	87%
B82-IA/SS-7	21%	157%	-98%	86%
B98-IA/SS-1	1%	-51%	48%	**417%**
B98-IA/SS-2	12%	102%	3%	**471%**
B98-IA/SS-3	7%	5%	7%	**5689%**
B98-IA/SS-4	35%	59%	43%	**270%**
B98-IA/SS-5	2106%	35%	3%	**264%**
B98-IA/SS-6	24%	**-43%**	-96%	**79%**
B98-IA/SS-7	20%	**-6%**	-97%	**24%**
B98-IA/SS-8	**-41%**	**-45%**	3%	**264%**
B98-IA/SS-9	**85%**	**186%**	-33%	**1471%**
B98-IA/SS-10	**-10%**	**-9%**	-49%	**493%**
B98-IA/SS-11	**0%**	**-6%**	**-60%**	**344%**
B98-IA/SS-12	93%	**-19%**	**-91%**	**900%**
B98-IA-13	NA	NA	**27%**	**3233%**

Table H-4 (continued). RPD between 2019 and 2023/2024 Analytical

Sample Type	Sub-Slab Vapor		Indoor Air	
Season	Summer	Winter	Summer	Winter
Location Name	Result		Result	
trans-1,2-Dichloroethene				
B82-IA/SS-1	-46%	-63%	-97%	1089%
B82-IA/SS-2	23%	141%	-100%	471%
B82-IA/SS-3	79%	57%	-99%	466%
B82-IA/SS-4	-45%	969%	-99%	485%
B82-IA/SS-5	-38%	41%	-99%	602%
B82-IA/SS-6	206%	-7%	-99%	300%
B82-IA/SS-7	36%	-64%	-100%	644%
B98-IA/SS-1	-50%	900%	-64%	8048%
B98-IA/SS-2	5%	3922%	-63%	3309%
B98-IA/SS-3	-79%	307%	-77%	9900%
B98-IA/SS-4	-74%	81%	-88%	2718%
B98-IA/SS-5	900%	536%	-95%	3496%
B98-IA/SS-6	-67%	43%	-100%	1100%
B98-IA/SS-7	-91%	-49%	-100%	959%
B98-IA/SS-8	-23%	33%	-75%	10041%
B98-IA/SS-9	77%	407%	-94%	15285%
B98-IA/SS-10	-11%	32%	-96%	5967%
B98-IA/SS-11	16%	91%	-96%	5515%
B98-IA/SS-12	8%	205%	-93%	7400%
B98-IA-13	NA	NA	66%	4614%

Table H-4 (continued). RPD between 2019 and 2023/2024 Analytical

Sample Type	Sub-Slab Vapor		Indoor Air	
Season	Summer	Winter	Summer	Winter
Location Name	Result		Result	
1,1-Dichloroethene				
B82-IA/SS-1	353%	**-39%**	3%	175%
B82-IA/SS-2	23%	155%	13%	138%
B82-IA/SS-3	79%	-67%	0%	208%
B82-IA/SS-4	12%	5%	10%	231%
B82-IA/SS-5	-41%	134%	13%	150%
B82-IA/SS-6	5%	103%	169%	107%
B82-IA/SS-7	21%	157%	-11%	115%
B98-IA/SS-1	1%	80%	16%	175%
B98-IA/SS-2	9%	102%	6%	177%
B98-IA/SS-3	7%	7%	3%	**469%**
B98-IA/SS-4	35%	63%	-9%	107%
B98-IA/SS-5	2106%	38%	-78%	**-53%**
B98-IA/SS-6	24%	10%	-3%	169%
B98-IA/SS-7	20%	**229%**	-7%	183%
B98-IA/SS-8	131%	-28%	6%	157%
B98-IA/SS-9	18%	85%	-3%	169%
B98-IA/SS-10	-30%	**-31%**	-3%	150%
B98-IA/SS-11	**-69%**	**-26%**	-3%	127%
B98-IA/SS-12	8%	67%	3%	225%
B98-IA-13	NA	NA	**352%**	**3400%**

Table H-4 (continued). RPD between 2019 and 2023/2024 Analytical

Sample Type	Sub-Slab Vapor		Indoor Air	
Season	Summer	Winter	Summer	Winter
Location Name	Result		Result	
Vinyl Chloride				
B82-IA/SS-1	175%	2900%	12%	227%
B82-IA/SS-2	23%	236%	23%	175%
B82-IA/SS-3	79%	218%	9%	273%
B82-IA/SS-4	12%	259%	20%	292%
B82-IA/SS-5	-4%	200%	23%	217%
B82-IA/SS-6	5%	157%	23%	146%
B82-IA/SS-7	21%	235%	16%	173%
B98-IA/SS-1	1%	139%	26%	227%
B98-IA/SS-2	9%	164%	16%	264%
B98-IA/SS-3	7%	39%	13%	217%
B98-IA/SS-4	35%	112%	0%	209%
B98-IA/SS-5	2106%	77%	0%	250%
B98-IA/SS-6	24%	44%	3%	217%
B98-IA/SS-7	20%	41%	0%	236%
B98-IA/SS-8	131%	-8%	16%	233%
B98-IA/SS-9	18%	138%	6%	217%
B98-IA/SS-10	-30%	46%	8%	245%
B98-IA/SS-11	-46%	27%	6%	236%
B98-IA/SS-12	8%	118%	13%	282%
B98-IA-13	NA	NA	16%	282%

Notes:

Relative Percent Difference (RPD) calculated by subtracting 2023/2024 result from 2019 and dividing by 2019 result

Results are paired by season: Summer (August 2023 and July 2019) and Winter (January 2024 and April 2019)

Bold results were detected above reporting limits

Red Highlight – Detected above reporting limit and increase of concentration exceeds 1 order of magnitude (RPD ≥ 216%)

Orange Highlight – Non-detect and increase of concentration exceeds 1 order of magnitude (RPD ≥ 216%)

Light Green Highlight – Non-detect and decrease of concentration exceeds 1 order of magnitude (RPD ≤ -68%)

Dark Green Highlight – Detected above reporting limit and decrease in concentration exceeds 1 order of magnitude (RPD ≤ -68%)

NA – Not Analyzed

Table H-5. Empirical Attenuation Factors for Building 82

Compound	Indoor Air		Sub-Slab Vapor		Attenuation Factor		
	Sample Name	Concentration (µg/m³)	Sample Name	Concentration (µg/m³)	IA / SS Ratio	Excluding Data Influenced by Background	Reason for Excluding
August 2023 Sampling Event							
Tetrachloroethene	Area 8-B82-IA1-20230802	23	Area 8-B82-SS1-20230802	210	0.1095	--	SS << PAL
	Area 8-B82-IA2-20230802	0.92	Area 8-B82-SS2-20230802	89	0.0103	--	
	Area 8-B82-IA3-20230802	0.71	Area 8-B82-SS3-20230802	130	0.0055	--	
	FD-1-20230802	0.68	Area 8-B82-SS3-20230802	130	0.0052		
	Area 8-B82-IA4-20230802	0.37	Area 8-B82-SS4-20230802	0.79 J	0.47	--	
			FD-3-20230802	0.74 U			
	Area 8-B82-IA5-20230802	0.29	Area 8-B82-SS5-20230802	1.2 J	0.2417	--	
	Area 8-B82-IA6-20230802	0.24	Area 8-B82-SS6-20230802	1.4 J	0.17	--	
	Area 8-B82-IA7-20230802	0.24	Area 8-B82-SS7-20230802	1.4 J	0.17	--	
	FD-2-20230802	0.23	Area 8-B82-SS7-20230802	1.4 J	0.1643	--	
Trichloroethene	Area 8-B82-IA1-20230802	0.25	Area 8-B82-SS1-20230802	4,000	0.000063	0.000063	--
	Area 8-B82-IA2-20230802	0.11	Area 8-B82-SS2-20230802	280	0.00039	0.00039	--
	Area 8-B82-IA3-20230802	0.037 J	Area 8-B82-SS3-20230802	2,400	0.000015	0.000015	--
	FD-1-20230802	0.037 J	Area 8-B82-SS3-20230802	2,400	0.000015	0.000015	--
	Area 8-B82-IA4-20230802	0.026 J	Area 8-B82-SS4-20230802	2.2 J	0.012		SS << PAL
			FD-3-20230802	3.5	0.0074		
	Area 8-B82-IA5-20230802	0.21	Area 8-B82-SS5-20230802	6.2	0.034		
	Area 8-B82-IA6-20230802	0.24	Area 8-B82-SS6-20230802	110	0.0022	0.0022	--
	Area 8-B82-IA7-20230802	0.025 J	Area 8-B82-SS7-20230802	98	0.00026	0.00026	--
	FD-2-20230802	0.024 J	Area 8-B82-SS7-20230802	98	0.00024	0.00024	--
Cis-1,2-Dichloroethene	Detected only in B82-IA6						
Trans-1,2-Dichloroethene	Area 8-B82-IA1-20230802	0.97	Area 8-B82-SS1-20230802	21 J	0.0462	--	SS << PAL
	Area 8-B82-IA2-20230802	0.64	Area 8-B82-SS2-20230802	0.81 U	0.7901	--	
	Area 8-B82-IA3-20230802	1	Area 8-B82-SS3-20230802	4.3 U	0.2326	--	
	FD-1-20230802	1	Area 8-B82-SS3-20230802	4.3 U	0.2326	--	
	Area 8-B82-IA4-20230802	2.6	Area 8-B82-SS4-20230802	1.6 J	1.6250	--	IA > SS, indicating background source
			FD-3-20230802	0.36 J	0.0000	--	SS << PAL
	Area 8-B82-IA5-20230802	3.7	Area 8-B82-SS5-20230802	0.42 J	8.8095	--	IA > SS, indicating background source
	Area 8-B82-IA6-20230802	3.4	Area 8-B82-SS6-20230802	1.5 J	2.2667	--	
	Area 8-B82-IA7-20230802	4	Area 8-B82-SS7-20230802	1.9 J	2.1053	--	
	FD-2-20230802	4	Area 8-B82-SS7-20230802	1.9 J	2.1053	--	
1,1-Dichloroethene	Not detected in any samples at Building 82						
Vinyl Chloride	Not detected in any samples at Building 82						

Table H-5 (continued). Empirical Attenuation Factors for Building

Compound	Indoor Air		Sub-Slab Vapor		Attenuation Factor		
	Sample Name	Concentration (µg/m³)	Sample Name	Concentration (µg/m³)	IA / SS Ratio	Excluding Data Influenced by Background	Reason for Excluding
January 2024 Sampling Event							
Tetrachloroethene	Area 8-B82-IA1-20240109	12	Area 8-B82-SS1-20240109	290	0.0414	--	SS << PAL
			FD-2-20240109	140	0.0857	--	
	Area 8-B82-IA2-20240109	0.45	Area 8-B82-SS2-20240109	92	0.0049	--	
	Area 8-B82-IA3-20240109	0.38	Area 8-B82-SS3-20240109	27	0.0141	--	
	Area 8-B82-IA4-20240109	0.29	Area 8-B82-SS4-20240109	0.43	0.67	--	
	Area 8-B82-IA5-20240109	0.21	Area 8-B82-SS5-20240109	0.64 J	0.33	--	
	Area 8-B82-IA6-20240109	0.25	Area 8-B82-SS6-20240109	0.61 J	0.4098	--	
	FD-1-20240109	0.23	Area 8-B82-SS6-20240109	0.61 J	0.38	--	
	Area 8-B82-IA7-20240109	0.3	Area 8-B82-SS7-20240109	36	0.01	--	
	Area 8-B82-IA1-20240109	12	Area 8-B82-SS1-20240109	290	0.0414	--	
Trichloroethene	Area 8-B82-IA1-20240109	0.42	Area 8-B82-SS1-20240109	3700	0.000114	0.000114	--
			FD-2-20240109	1800	0.00023	0.00023	--
	Area 8-B82-IA2-20240109	0.19	Area 8-B82-SS2-20240109	390	0.000487	0.000487	--
	Area 8-B82-IA3-20240109	0.2	Area 8-B82-SS3-20240109	350	0.000571	0.000571	--
	Area 8-B82-IA4-20240109	0.14	Area 8-B82-SS4-20240109	1.1 J	0.127	--	SS << PAL
	Area 8-B82-IA5-20240109	0.19	Area 8-B82-SS5-20240109	8.2	0.0171	--	
	Area 8-B82-IA6-20240109	0.24	Area 8-B82-SS6-20240109	37	0.006	0.006486	--
	FD-1-20240109	0.27	Area 8-B82-SS6-20240109	37	0.0073	0.007297	--
	Area 8-B82-IA7-20240109	0.18	Area 8-B82-SS7-20240109	200	0.00090	0.00090	--
Cis-1,2-Dichloroethene	Detected only in B82-IA1						
Trans-1,2-Dichloroethene	Area 8-B82-IA1-20240109	6.3	Area 8-B82-SS1-20240109	19 J	0.3316	--	SS << PAL
			FD-2-20240109	10 J	0.6300	--	
	Area 8-B82-IA2-20240109	2	Area 8-B82-SS2-20240109	0.89 J	2.2472	--	IA > SS, indicating background source
	Area 8-B82-IA3-20240109	3	Area 8-B82-SS3-20240109	3.3	0.9091	--	SS << PAL
	Area 8-B82-IA4-20240109	3.1	Area 8-B82-SS4-20240109	3.1	1.0000	--	IA = SS, indicating background source
	Area 8-B82-IA5-20240109	3.3	Area 8-B82-SS5-20240109	0.45 J	7.3333	--	SS << PAL
	Area 8-B82-IA6-20240109	3	Area 8-B82-SS6-20240109	0.27 J	11.1111	--	IA > SS, indicating background source
	FD-1-20240109	3.3	Area 8-B82-SS6-20240109	0.27 J	12.2222	--	
	Area 8-B82-IA7-20240109	3.2	Area 8-B82-SS7-20240109	0.54 J	5.9259	--	
1,1-Dichloroethene	Detected only in B82-SS1						
Vinyl Chloride	Not detected in any samples at Building 82						
					Maximum:	**0.007**	

Notes:
Gray shaded cells indicate that the sample concentration is greater than the project action limit.
Attenuation factors were estimated for collocated samples with analytes that were detected in sub-slab vapor samples as the ratio of the indoor air to sub-slab vapor concentrations.
Attenuation factors calculated with non-detect indoor air results are an upper-bound estimate for that set of collocated samples.
-- – not applicable

Table H-5 (continued). Empirical Attenuation Factors for Building

Acronyms/Abbreviations:
µg/m^3 – microgram per cubic meter
IA – indoor air
J – estimated below the reporting limit
PAL – project action limit
SS – sub-slab vapor
U – not detected
VI – vapor intrusion

Table H-6. Reevaluated Sub-Slab Results for Building

Analyte Name					Tetrachloroethene		Trichloroethene		cis-1,2-Dichloroethene		trans-1,2-Dichloroethene		1,1-Dichloroethene		Vinyl chloride	
PAL Soil Gas – Sub-slab (µg/m³)					1,330		66.7		1,330		1,330		6,670		93.3	
Building-Specific Screening Level (BSAF=0.006) Soil Gas – Sub-slab (µg/m³)					5,714		286		5,714		5,714		28,571		400	
Location Name	Sample Name	Sample Type	Collect Date	Description	Result (µg/m³)											
August 2023																
Area 8-B82-SS1	Area 8-B82-SS1-20230802	N	8/2/2023	Soil Gas – Sub-slab	210		4,000		7.7	U	21	J	7.7	U	7.7	U
Area 8-B82-SS2	Area 8-B82-SS2-20230802	N	8/2/2023	Soil Gas – Sub-slab	89		280		0.81	U	0.81	U	0.81	U	0.81	U
Area 8-B82-SS3	Area 8-B82-SS3-20230802	N	8/2/2023	Soil Gas – Sub-slab	130		2,400		4.3	U	4.3	J	4.3	U	4.3	U
Area 8-B82-SS4	Area 8-B82-SS4-20230802	P3	8/2/2023	Soil Gas – Sub-slab	0.79	J	2.2	J	0.83	U	1.6	J	0.83	U	0.83	U
Area 8-B82-SS4	FD-3-20230802	FD3	8/2/2023	Soil Gas – Sub-slab	0.74	U	3.5		0.74	U	0.36	J	0.74	U	0.74	U
Area 8-B82-SS5	Area 8-B82-SS5-20230802	N	8/2/2023	Soil Gas – Sub-slab	1.2	J	6.2		0.65	U	0.42	J	0.65	U	0.65	U
Area 8-B82-SS6	Area 8-B82-SS6-20230802	N	8/2/2023	Soil Gas – Sub-slab	1.4	J	110		0.79	U	1.5	J	0.79	U	0.79	U
Area 8-B82-SS7	Area 8-B82-SS7-20230802	N	8/2/2023	Soil Gas – Sub-slab	1.4	J	98		0.82	U	1.9	J	0.82	U	0.82	U
January 2024																
Area 8-B82-SS1	Area 8-B82-SS1-20240109	P2	1/9/2024	Soil Gas – Sub-slab	290		3,700		7.7	U	19	J	4.3	J	6.6	U
Area 8-B82-SS1	FD-2-20240109	FD2	1/9/2024	Soil Gas – Sub-slab	140		1,800		0.81	U	10	J	1.8	J	3.2	U
Area 8-B82-SS2	Area 8-B82-SS2-20240109	N	1/9/2024	Soil Gas – Sub-slab	92		390		4.3	U	0.89	J	0.74	U	0.74	U
Area 8-B82-SS3	Area 8-B82-SS3-20240109	N	1/9/2024	Soil Gas – Sub-slab	27		350		0.83	U	3.3		0.7	U	0.7	U
Area 8-B82-SS4	Area 8-B82-SS4-20240109	N	1/9/2024	Soil Gas – Sub-slab	0.43		1.1	J	0.74	U	3.1		0.79	U	0.79	U
Area 8-B82-SS5	Area 8-B82-SS5-20240109	N	1/9/2024	Soil Gas – Sub-slab	0.64	J	8.2		0.75	U	0.45	J	0.75	U	0.75	U
Area 8-B82-SS6	Area 8-B82-SS6-20240109	N	1/9/2024	Soil Gas – Sub-slab	0.61	J	37		0.79	U	0.27	J	0.59	U	0.59	U
Area 8-B82-SS7	Area 8-B82-SS7-20240109	N	1/9/2024	Soil Gas – Sub-slab	36		200		0.82	U	0.54	J	0.77	U	0.77	U

Notes:
Orange shading indicates that the sub-slab vapor concentration is greater than PAL, but not the Building-Specific Screening Level
Pink shading indicates that sub-slab vapor concentration is greater than both the PAL and the Building-Specific Screening Level
Acronyms/Abbreviations:
µg/m³ – micrograms per cubic meter
BSAF – building-specific attenuation factor
FD – field duplicate
J – estimated below the reporting limit
N – normal sample
NE – not established
P – parent sample
PAL – project action limit
SS – sub-slab vapor
U – not detected

Table H-7. Vapor Intrusion Sampling Results for Building

Analyte Name					Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl chloride
PAL Air – Indoor (µg/m³)					40	2	40	40	200	2.8
PAL Soil Gas – Sub-slab (µg/m³)					1330	66.7	1330	1330	6670	93.3
Location Name	**Sample Name**	**Sample Type**	**Date Collected**	**Description**	**Result (µg/m³)**	**Result (µg/m³)**	**Result (µg/m³)**	**Result (µg/m³)**	**Result (µg/m³)**	**Result (µg/m³)**
August 2023										
Area 8-B98-IA1	Area 8-B98-IA1-20230801	N	8/1/2023[a]	Air – Indoor	0.029 J	0.033 J	0.034 U	3.4	0.036 U	0.039 U
Area 8-B98-SS1	Area 8-B98-SS1-20230801	N	8/1/2023	Soil Gas – Sub-slab	3.1	9.8	0.73 U	0.6 J	0.73 U	0.73 U
				Air – Indoor- Corrected[b]	0.004 J	0.033 J	0.034 J	3.08	0.036 U	0.039 U
Area 8-B98-IA2	Area 8-B98-IA2-20230801	N	8/1/2023	Air – Indoor	0.024 J	0.016 J	0.032 U	0.99	0.033 U	0.036 U
Area 8-B98-SS2	Area 8-B98-SS2-20230801	N	8/1/2023	Soil Gas – Sub-slab	6.3	11	0.76 U	0.59 J	0.76 U	0.76 U
				Air – Indoor- Corrected[b]	0 J	0.016 U	0.032 U	0.67	0.033 U	0.036 U
Area 8-B98-IA3	Area 8-B98-IA3-20230801	N	8/1/2023	Air – Indoor	0.025 J	0.026 J	0.03 U	3.5	0.032 U	0.035 U
Area 8-B98-SS3	Area 8-B98-SS3-20230801	N	8/1/2023	Soil Gas – Sub-slab	0.73 J	15	0.78 U	1.5 J	0.78 U	0.78 U
				Air – Indoor- Corrected[b]	0 J	0.026 J	0.03 J	3.18	0.032 U	0.035 U
Area 8-B98-IA4	Area 8-B98-IA4-20230801	N	8/1/2023	Air – Indoor	0.044	0.081	0.03 U	0.95	0.032 U	0.035 U
Area 8-B98-SS4	Area 8-B98-SS4-20230801	N	8/1/2023	Soil Gas – Sub-slab	1.2 J	**77**	0.88 U	1.4 J	0.88 U	0.88 U
				Air – Indoor- Corrected[b]	0.019 J	0.081	0.03 J	0.63	0.032 U	0.035 U
Area 8-B98-IA5	Area 8-B98-IA5-20230801	N	8/1/2023	Air – Indoor	0.084	0.22	0.032 U	0.6	0.033 U	0.036 U
Area 8-B98-SS5	Area 8-B98-SS5-20230801	N	8/1/2023	Soil Gas – Sub-slab	15 U	14 U	15 U	15 U	15 U	15 U
				Air – Indoor- Corrected[b]	0.059	0.22	0.032 J	0.28	0.033 U	0.036 U
Area 8-B98-IA6	Area 8-B98-IA6-20230801	N	8/1/2023	Air – Indoor	0.028 J	0.03 J	0.028 U	0.38	0.03 U	0.032 U
Area 8-B98-SS6	Area 8-B98-SS6-20230802	N	8/2/2023	Soil Gas – Sub-slab	6.1	6.3	0.77 U	1.8 J	0.77 U	0.77 U
				Air – Indoor- Corrected[b]	0.003	0.03	0.028	0	0.03 U	0.032 U
Area 8-B98-IA7	Area 8-B98-IA7-20230801	N	8/1/2023	Air – Indoor	0.027 J+	0.034 J+	0.026 U	0.46 J+	0.028 U	0.03 U
Area 8-B98-SS7	Area 8-B98-SS7-20230802	N	8/2/2023	Soil Gas – Sub-slab	2.8	33	0.79 U	4.1	0.79 U	0.79 U
				Air – Indoor- Corrected[b]	0.002	0.034	0.026	0	0.028 U	0.03 U
Area 8-B98-IA8	Area 8-B98-IA8-20230801	N	8/1/2023	Air – Indoor	0.025 J	0.016 J	0.032 U	3.2	0.034 U	0.037 U
Area 8-B98-SS8	Area 8-B98-SS8-20230802	N	8/2/2023	Soil Gas – Sub-slab	150	**560**	130	6.4	1.5 U	1.5 U
				Air – Indoor- Corrected[b]	0	0.016	0.032 J	2.88	0.034 U	0.037 U
Area 8-B98-IA1	Area 8-B98-IA1-20230801	N	8/1/2023	Air – Indoor	0.029 J	0.033 J	0.034 U	3.4	0.036 U	0.039 U

Table H-7 (continued). Vapor Intrusion Sampling Results for Building

Analyte Name					Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl chloride
PAL Air – Indoor (µg/m³)					40	2	40	40	200	2.8
PAL Soil Gas – Sub-slab (µg/m³)					1330	66.7	1330	1330	6670	93.3
Location Name	**Sample Name**	**Sample Type**	**Date Collected**	**Description**	**Result (µg/m³)**	**Result (µg/m³)**	**Result (µg/m³)**	**Result (µg/m³)**	**Result (µg/m³)**	**Result (µg/m³)**
Area 8-B98-IA9	Area 8-B98-IA9-20230801	N	8/1/2023	Air – Indoor	0.027 J	0.033 J	0.029 U	1.3	0.03 U	0.033 U
Area 8-B98-SS9	Area 8-B98-SS9-20230802	N	8/2/2023	Soil Gas – Sub-slab	30	**380**	1.2 J	11	0.77 U	0.77 U
				Air – Indoor- Corrected[(b)]	0.002	0.033	0.029	0.98	0.03 U	0.033 U
Area 8-B98-IA10	Area 8-B98-IA10-20230801	N	8/1/2023	Air – Indoor	0.034 U	0.018 J	0.034 U	1.3	0.035 U	0.039 U
Area 8-B98-SS10	Area 8-B98-SS10-20230802	N	8/2/2023	Soil Gas – Sub-slab	930	**1100**	19	16	2.6 U	2.6 U
				Air – Indoor- Corrected[(b)]	0.009	0.018	0.034	0.98	0.035 U	0.039 U
Area 8-B98-IA11	Area 8-B98-IA11-20230801	N	8/1/2023	Air – Indoor	0.028 J	0.031 J	0.027 J	0.93	0.032 U	0.035 U
Area 8-B98-SS11	Area 8-B98-SS11-20230802	N	8/2/2023	Soil Gas – Sub-slab	180	**1000**	16	11	1.1 J	1.9 U
				Air – Indoor- Corrected[(b)]	0.003	0.031	0.027	0.61	0.032 U	0.035 U
Area 8-B98-IA12	Area 8-B98-IA12-20230801	N	8/1/2023	Air – Indoor	0.12	0.15	0.013 J	8.2	0.032 U	0.035 U
Area 8-B98-SS12	Area 8-B98-SS12-20230802	N	8/2/2023	Soil Gas – Sub-slab	24	24	0.77 U	14	0.77 U	0.77 U
				Air – Indoor- Corrected[(b)]	0.095	0.15	0.013	7.88	0.032 U	0.035 U
Area 8-B98-IA13	Area 8-B98-IA13-20230801	N	8/1/2023	Air – Indoor	0.054	0.074	0.8	**730**	0.14	0.036 U
				Air – Indoor- Corrected[(b)]	0.029	0.074 J	0.8	729.68	0.14 U	0.036 U
Area 8-OA1	Area 8-OA1-20230801	N	8/1/2023	Air – Outdoor	0.025 J	0.032 U	0.032 U	0.32	0.034 U	0.037 U
January 2024										
Area 8-B98-IA1	Area 8-B98-IA1-20240110	N	1/10/2024	Air – Indoor	0.09	0.15	0.093	**66** D	0.033 U	0.036 U
Area 8-B98-SS1	Area 8-B98-SS1-20240110	N	1/10/2024	Soil Gas – Sub-slab	12	37	0.74 U	16	0.74 U	0.74 U
				Air – Indoor- Corrected[(b)]	0.065 J	0.15 J	0.093 J	61.8	0.033 U	0.036 U
Area 8-B98-IA2	Area 8-B98-IA2-20240110	N	1/10/2024	Air – Indoor	0.096	0.17	0.12	**75** D	0.036 U	0.04 U
Area 8-B98-SS2	Area 8-B98-SS2-20240110	N	1/10/2024	Soil Gas – Sub-slab	5.3	18	0.87 U	37	0.87 U	0.87 U
				Air – Indoor- Corrected[(b)]	0.07 J	0.17 U	0.12 U	70.8	0.036 U	0.04 U

Table H-7 (continued). Vapor Intrusion Sampling Results for Building

Analyte Name					Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl chloride
PAL Air – Indoor (µg/m³)					40	2	40	40	200	2.8
PAL Soil Gas – Sub-slab (µg/m³)					1330	66.7	1330	1330	6670	93.3
Location Name	**Sample Name**	**Sample Type**	**Date Collected**	**Description**	**Result (µg/m³)**	**Result (µg/m³)**	**Result (µg/m³)**	**Result (µg/m³)**	**Result (µg/m³)**	**Result (µg/m³)**
Area 8-B98-IA3	Area 8-B98-IA3-20240110	P3	1/10/2024	Air – Indoor	0.089	0.15	1.1	**740** D	0.074	0.038 U
Area 8-B98-IA3	FD-3-20240110	FD3	1/10/2024	Air – Indoor	0.088	0.14	1.1	**790** D	0.082	0.036 U
Area 8-B98-SS3	Area 8-B98-SS3-20240110	N	1/10/2024	Soil Gas – Sub-slab	2.7	16	0.79 U	110	0.79 U	0.79 U
				Air – Indoor- Corrected[(b)]	0.064 J	0.15 J	1.1 J	735.8	0.074 U	0.038 U
Area 8-B98-IA4	Area 8-B98-IA4-20240110	N	1/10/2024	Air – Indoor	0.097	0.18	0.1	**62** D	0.031 U	0.034 U
Area 8-B98-SS4	Area 8-B98-SS4-20240110	N	1/10/2024	Soil Gas – Sub-slab	5.8	**110**	0.7 U	29	0.7 U	0.7 U
				Air – Indoor- Corrected[(b)]	0.072 J	0.18	0.1 J	57.8	0.031 U	0.034 U
Area 8-B98-IA5	Area 8-B98-IA5-20240110	N	1/10/2024	Air – Indoor	0.74	0.36	0.051	32	0.046	0.042 U
Area 8-B98-SS5	Area 8-B98-SS5-20240110	N	1/10/2024	Soil Gas – Sub-slab	35	34	0.62 U	7	0.62 U	0.62 U
				Air – Indoor- Corrected[(b)]	0.715	0.36	0.051 J	27.8	0.046 U	0.042 U
Area 8-B98-IA6	Area 8-B98-IA6-20240110	N	1/10/2024	Air – Indoor	0.04	0.063	0.025 J	18	0.035 U	0.038 U
Area 8-B98-SS6	Area 8-B98-SS6-20240110	N	1/10/2024	Soil Gas – Sub-slab	80	**84**	0.41 J	12	0.78 U	0.78 U
				Air – Indoor- Corrected[(b)]	0.015	0.063	0.025	14	0.035 U	0.038 U
Area 8-B98-IA7	Area 8-B98-IA7-20240110	N	1/10/2024	Air – Indoor	0.042	0.064	0.026 J	18	0.034 U	0.037 U
Area 8-B98-SS7	Area 8-B98-SS7-20240110	N	1/10/2024	Soil Gas – Sub-slab	110	**170**	1.5 J	24	2.3 J	0.76 U
				Air – Indoor- Corrected[(b)]	0.017	0.064	0.026	14	0.034 U	0.037 U
Area 8-B98-IA8	Area 8-B98-IA8-20240110	N	1/10/2024	Air – Indoor	0.11	0.19	0.12	**72** D	0.036 U	0.04 U
Area 8-B98-SS8	Area 8-B98-SS8-20240110	N	1/10/2024	Soil Gas – Sub-slab	220	**530**	110	12	0.87 U	0.87 U
				Air – Indoor- Corrected[(b)]	0.085	0.19	0.12 J	67.8	0.036 U	0.04 U
Area 8-B98-IA9	Area 8-B98-IA9-20240110	N	1/10/2024	Air – Indoor	0.15	0.29	0.22	**140** D	0.035 U	0.038 U
Area 8-B98-SS9	Area 8-B98-SS9-20240110	N	1/10/2024	Soil Gas – Sub-slab	7.5	**170**	1.2 J	34	0.76 U	0.76 U
				Air – Indoor- Corrected[(b)]	0.125	0.29	0.22	135.8	0.035 U	0.038 U
Area 8-B98-IA10	Area 8-B98-IA10-20240110	N	1/10/2024	Air – Indoor	0.14	0.23	0.16	**91** D	0.035 U	0.038 U
Area 8-B98-SS10	Area 8-B98-SS10-20240110	P5	1/10/2024	Soil Gas – Sub-slab	**1400**	**1100**	20	41	1.1 J	1.9 U
Area 8-B98-SS10	FD-5-20240110	FD5	1/10/2024	Soil Gas – Sub-slab	1300	**1100**	19	39	1.2 J	1.7 U
				Air – Indoor- Corrected[(b)]	0.115	0.23	0.16	86.8	0.035 U	0.038 U

Table H-7 (continued). Vapor Intrusion Sampling Results for Building

Analyte Name					Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl chloride
PAL Air – Indoor (µg/m³)					40	2	40	40	200	2.8
PAL Soil Gas – Sub-slab (µg/m³)					1330	66.7	1330	1330	6670	93.3
Location Name	**Sample Name**	**Sample Type**	**Date Collected**	**Description**	**Result (µg/m³)**	**Result (µg/m³)**	**Result (µg/m³)**	**Result (µg/m³)**	**Result (µg/m³)**	**Result (µg/m³)**
Area 8-B98-IA11	Area 8-B98-IA11-20240110	N	1/10/2024	Air – Indoor	0.12	0.2	0.12	**73** D	0.034 U	0.037 U
Area 8-B98-SS11	Area 8-B98-SS11-20240110	N	1/10/2024	Soil Gas – Sub-slab	460	**1000**	16	21	1.4 J	1.9 U
				Air – Indoor- Corrected[(b)]	0.095	0.2	0.12	68.8	0.034 U	0.037 U
Area 8-B98-IA12	Area 8-B98-IA12-20240110	N	1/10/2024	Air – Indoor	0.092	0.068	0.15	**120** D	0.039 U	0.042 U
Area 8-B98-SS12	Area 8-B98-SS12-20240110	N	1/10/2024	Soil Gas – Sub-slab	74	**69**	0.47 J	64	0.72 U	0.72 U
				Air – Indoor- Corrected[(b)]	0.067	0.068	0.15	115.8	0.039 U	0.042 U
Area 8-B98-IA13	Area 8-B98-IA13-20240110	N	1/10/2024	Air – Indoor	0.047	0.058	11	**6600**	0.42	0.042 U
				Air – Indoor- Corrected[(b)]	0.022	0.058 J	11	6595.8	0.42 U	0.042 U
Area 8-OA2	Area 8-OA2-20240110	P4	1/10/2024	Air – Outdoor	0.025 J	0.032 U	0.032 U	4.2	0.033 U	0.036 U
Area 8-OA2	FD-4-20240110	FD4	1/10/2024	Air – Outdoor	0.027 J	0.032 U	0.032 U	4.1	0.033 U	0.036 U

Notes:
Blue shading indicates corrected indoor air results.
Orange shading indicates outdoor air samples.
Bold – exceeds PAL
(a) Sample was collected over two days and the start of collection is listed as the date collected; see Section 2.2.1 for more details
(b) Indoor Air Corrections were calculated as described in Section 2.7.
Acronyms/Abbreviations:
µg/m³ – micrograms per cubic meter
D – the reported result is from a dilution
FD – Field Duplicate
J – estimated below the reporting limit.
LOQ – limit of quantitation
MDL – method detection limit
N – Normal (no field duplicate)
NE – note established
P – Parent
PAL – project action limit
U – Undetected at the limit of detection shown

Table H-8. Relative Concentrations of Detected Compounds for Building 98

Location Name	Sample Name	Type	Date	Description	PCE	TCE	cDCE	tDCE	1,1-DCE	VC
August 2023 Sampling Event										
Area 8-B98-IA1	Area 8-B98-IA1-20230801	N	8/1/2023*	Air - Indoor	0.8%	0.9%	1.0%	95.2%	1.0%	1.1%
Area 8-B98-SS1	Area 8-B98-SS1-20230801	N	8/1/2023	Soil Gas - Sub-slab	19.8%	62.5%	4.7%	3.8%	4.7%	4.7%
Area 8-B98-IA2	Area 8-B98-IA2-20230801	N	8/1/2023	Air - Indoor	2.1%	1.4%	2.8%	87.5%	2.9%	3.2%
Area 8-B98-SS2	Area 8-B98-SS2-20230801	N	8/1/2023	Soil Gas - Sub-slab	31.2%	54.5%	3.8%	2.9%	3.8%	3.8%
Area 8-B98-IA3	Area 8-B98-IA3-20230801	N	8/1/2023	Air - Indoor	0.7%	0.7%	0.8%	95.9%	0.9%	1.0%
Area 8-B98-SS3	Area 8-B98-SS3-20230801	N	8/1/2023	Soil Gas - Sub-slab	3.7%	76.6%	4.0%	7.7%	4.0%	4.0%
Area 8-B98-IA4	Area 8-B98-IA4-20230801	N	8/1/2023	Air - Indoor	3.8%	6.9%	2.6%	81.1%	2.7%	3.0%
Area 8-B98-SS4	Area 8-B98-SS4-20230801	N	8/1/2023	Soil Gas - Sub-slab	1.5%	93.6%	1.1%	1.7%	1.1%	1.1%
Area 8-B98-IA5	Area 8-B98-IA5-20230801	N	8/1/2023	Air - Indoor	8.4%	21.9%	3.2%	59.7%	3.3%	3.6%
Area 8-B98-SS5	Area 8-B98-SS5-20230801	N	8/1/2023	Soil Gas - Sub-slab	16.9%	15.7%	16.9%	16.9%	16.9%	16.9%
Area 8-B98-IA6	Area 8-B98-IA6-20230801	N	8/1/2023	Air - Indoor	5.3%	5.7%	5.3%	72.0%	5.7%	6.1%
Area 8-B98-SS6	Area 8-B98-SS6-20230802	N	8/2/2023	Soil Gas - Sub-slab	36.9%	38.2%	4.7%	10.9%	4.7%	4.7%
Area 8-B98-IA7	Area 8-B98-IA7-20230801	N	8/1/2023	Air - Indoor	4.5%	5.6%	4.3%	76.0%	4.6%	5.0%
Area 8-B98-SS7	Area 8-B98-SS7-20230802	N	8/2/2023	Soil Gas - Sub-slab	6.6%	78.1%	1.9%	9.7%	1.9%	1.9%
Area 8-B98-IA8	Area 8-B98-IA8-20230801	N	8/1/2023	Air - Indoor	0.7%	0.5%	1.0%	95.7%	1.0%	1.1%
Area 8-B98-SS8	Area 8-B98-SS8-20230802	N	8/2/2023	Soil Gas - Sub-slab	17.7%	65.9%	15.3%	0.8%	0.2%	0.2%
Area 8-B98-IA9	Area 8-B98-IA9-20230801	N	8/1/2023	Air - Indoor	1.9%	2.3%	2.0%	89.5%	2.1%	2.3%
Area 8-B98-SS9	Area 8-B98-SS9-20230802	N	8/2/2023	Soil Gas - Sub-slab	7.1%	89.7%	0.3%	2.6%	0.2%	0.2%

Table H-8 (continued). Relative Concentrations of Detected Compounds for Building

Location Name	Sample Name	Type	Date	Description	PCE	TCE	cDCE	tDCE	1,1-DCE	VC
Area 8-B98-IA10	Area 8-B98-IA10-20230801	N	8/1/2023	Air - Indoor	2.3%	1.2%	2.3%	89.0%	2.4%	2.7%
Area 8-B98-SS10	Area 8-B98-SS10-20230802	N	8/2/2023	Soil Gas - Sub-slab	44.9%	53.1%	0.9%	0.8%	0.1%	0.1%
Area 8-B98-IA11	Area 8-B98-IA11-20230801	N	8/1/2023	Air - Indoor	2.6%	2.9%	2.5%	85.9%	3.0%	3.2%
Area 8-B98-SS11	Area 8-B98-SS11-20230802	N	8/2/2023	Soil Gas - Sub-slab	14.9%	82.6%	1.3%	0.9%	0.1%	0.2%
Area 8-B98-IA12	Area 8-B98-IA12-20230801	N	8/1/2023	Air - Indoor	1.4%	1.8%	0.2%	95.9%	0.4%	0.4%
Area 8-B98-SS12	Area 8-B98-SS12-20230802	N	8/2/2023	Soil Gas - Sub-slab	37.3%	37.3%	1.2%	21.8%	1.2%	1.2%
Area 8-B98-IA13	Area 8-B98-IA13-20230801	N	8/1/2023	Air - Indoor	0.0%	0.0%	0.1%	99.8%	0.0%	0.0%
Area 8-OA1	Area 8-OA1-20230801	N	8/1/2023	Air - Outdoor	5.2%	6.7%	6.7%	66.7%	7.1%	7.7%
January 2024 Sampling Event										
Area 8-B98-IA1	Area 8-B98-IA1-20240110	N	1/10/2024	Air - Indoor	0.1%	0.2%	0.1%	99.4%	0.0%	0.1%
Area 8-B98-SS1	Area 8-B98-SS1-20240110	N	1/10/2024	Soil Gas - Sub-slab	17.9%	55.0%	1.1%	23.8%	1.1%	1.1%
Area 8-B98-IA2	Area 8-B98-IA2-20240110	N	1/10/2024	Air - Indoor	0.1%	0.2%	0.2%	99.4%	0.0%	0.1%
Area 8-B98-SS2	Area 8-B98-SS2-20240110	N	1/10/2024	Soil Gas - Sub-slab	8.4%	28.6%	1.4%	58.8%	1.4%	1.4%
Area 8-B98-IA3	Area 8-B98-IA3-20240110	P3	1/10/2024	Air - Indoor	0.0%	0.0%	0.1%	99.8%	0.0%	0.0%
Area 8-B98-IA3	FD-3-20240110	FD3	1/10/2024	Air - Indoor	0.0%	0.0%	0.1%	99.8%	0.0%	0.0%
Area 8-B98-SS3	Area 8-B98-SS3-20240110	N	1/10/2024	Soil Gas - Sub-slab	2.1%	12.2%	0.6%	83.9%	0.6%	0.6%
Area 8-B98-IA4	Area 8-B98-IA4-20240110	N	1/10/2024	Air - Indoor	0.2%	0.3%	0.2%	99.3%	0.0%	0.1%
Area 8-B98-SS4	Area 8-B98-SS4-20240110	N	1/10/2024	Soil Gas - Sub-slab	3.9%	74.9%	0.5%	19.7%	0.5%	0.5%
Area 8-B98-IA5	Area 8-B98-IA5-20240110	N	1/10/2024	Air - Indoor	2.2%	1.1%	0.2%	96.3%	0.1%	0.1%
Area 8-B98-SS5	Area 8-B98-SS5-20240110	N	1/10/2024	Soil Gas - Sub-slab	45.0%	43.7%	0.8%	9.0%	0.8%	0.8%

Table H-8 (continued). Relative Concentrations of Detected Compounds for Building

Location Name	Sample Name	Type	Date	Description	PCE	TCE	cDCE	tDCE	1,1-DCE	VC
Area 8-B98-IA6	Area 8-B98-IA6-20240110	N	1/10/2024	Air - Indoor	0.2%	0.3%	0.1%	98.9%	0.2%	0.2%
Area 8-B98-SS6	Area 8-B98-SS6-20240110	N	1/10/2024	Soil Gas - Sub-slab	45.0%	47.2%	0.2%	6.7%	0.4%	0.4%
Area 8-B98-IA7	Area 8-B98-IA7-20240110	N	1/10/2024	Air - Indoor	0.2%	0.4%	0.1%	98.9%	0.2%	0.2%
Area 8-B98-SS7	Area 8-B98-SS7-20240110	N	1/10/2024	Soil Gas - Sub-slab	35.6%	55.1%	0.5%	7.8%	0.7%	0.2%
Area 8-B98-IA8	Area 8-B98-IA8-20240110	N	1/10/2024	Air - Indoor	0.2%	0.3%	0.2%	99.3%	0.0%	0.1%
Area 8-B98-SS8	Area 8-B98-SS8-20240110	N	1/10/2024	Soil Gas - Sub-slab	25.2%	60.7%	12.6%	1.4%	0.1%	0.1%
Area 8-B98-IA9	Area 8-B98-IA9-20240110	N	1/10/2024	Air - Indoor	0.1%	0.2%	0.2%	99.5%	0.0%	0.0%
Area 8-B98-SS9	Area 8-B98-SS9-20240110	N	1/10/2024	Soil Gas - Sub-slab	3.5%	79.4%	0.6%	15.9%	0.4%	0.4%
Area 8-B98-IA10	Area 8-B98-IA10-20240110	N	1/10/2024	Air - Indoor	0.2%	0.3%	0.2%	99.3%	0.0%	0.0%
Area 8-B98-SS10	Area 8-B98-SS10-20240110	P5	1/10/2024	Soil Gas - Sub-slab	54.6%	42.9%	0.8%	1.6%	0.0%	0.1%
Area 8-B98-SS10	FD-5-20240110	FD5	1/10/2024	Soil Gas - Sub-slab	52.8%	44.7%	0.8%	1.6%	0.0%	0.1%
Area 8-B98-IA11	Area 8-B98-IA11-20240110	N	1/10/2024	Air - Indoor	0.2%	0.3%	0.2%	99.3%	0.0%	0.1%
Area 8-B98-SS11	Area 8-B98-SS11-20240110	N	1/10/2024	Soil Gas - Sub-slab	30.7%	66.7%	1.1%	1.4%	0.1%	0.1%
Area 8-B98-IA12	Area 8-B98-IA12-20240110	N	1/10/2024	Air - Indoor	0.1%	0.1%	0.1%	99.7%	0.0%	0.0%
Area 8-B98-SS12	Area 8-B98-SS12-20240110	N	1/10/2024	Soil Gas - Sub-slab	35.4%	33.0%	0.2%	30.6%	0.3%	0.3%
Area 8-B98-IA13	Area 8-B98-IA13-20240110	N	1/10/2024	Air - Indoor	0.0%	0.0%	0.2%	99.8%	0.0%	0.0%

Table H-8 (continued). Relative Concentrations of Detected Compounds for Building

Location Name	Sample Name	Type	Date	Description	PCE	TCE	cDCE	tDCE	1,1-DCE	VC
Area 8-OA2	Area 8-OA2-20240110	P4	1/10/2024	Air - Outdoor	0.6%	0.7%	0.7%	96.4%	0.8%	0.8%
Area 8-OA2	FD-4-20240110	FD4	1/10/2024	Air - Outdoor	0.6%	0.8%	0.8%	96.2%	0.8%	0.8%

Notes:

Blue shading indicates relative percent is less than 5%
Green shading indicates relative percent is less than 25%
Yellow shading indicates relative percent is between 25% and 50%
Orange shading indicates relative percent is between 50% and 75%
Red shading indicates relative percent greater than 75%

Acronyms/Abbreviations:
1,1-DCE – 1,1-dichloroethene
cDCE – cis-1,2-dichloroethene
*Sample was collected over two days and the start of collection is listed as the date collected; see Section 2.2.1 for more details
FD – field duplicate
IA – indoor air
N – normal sample
OA – outdoor air
P – parent sample
PCE – tetrachloroethene
SS – sub-slab vapor
SV – soil vapor
TCE – trichloroethene
tDCE – trans-1,2-dichloroethene
VC – vinyl chloride

Table H-9. Empirical Attenuation Factors for Building 98

Compound	Indoor Air		Sub-Slab Vapor		Attenuation Factor		
	Sample Name	Concentration (µg/m³)	Sample Name	Concentration (µg/m³)	IA / SS Ratio	Excluding Data Influenced by Background	Reason for Excluding
August 2023 Sampling Event							
Tetrachloroethene	Area 8-B98-IA1-20230801	0.029 J	Area 8-B98-SS1-20230801	3.1	0.0094	--	SS << PAL
	Area 8-B98-IA2-20230801	0.024 J	Area 8-B98-SS2-20230801	6.3	0.0038	--	
	Area 8-B98-IA3-20230801	0.025 J	Area 8-B98-SS3-20230801	0.73 J	0.034	--	
	Area 8-B98-IA4-20230801	0.044	Area 8-B98-SS4-20230801	1.2 J	0.037	--	
	Area 8-B98-IA5-20230801	0.1	Area 8-B98-SS5-20230801	15 U	0.0056	--	
	Area 8-B98-IA6-20230801	0.028 J	Area 8-B98-SS6-20230802	6.1	0.0046	--	
	Area 8-B98-IA7-20230801	0.027 J+	Area 8-B98-SS7-20230802	2.8	0.0096	--	
	Area 8-B98-IA8-20230801	0.025 J	Area 8-B98-SS8-20230802	150	0.00017	--	
	Area 8-B98-IA9-20230801	0.027 J	Area 8-B98-SS9-20230802	30	0.00090	--	
	Area 8-B98-IA10-20230801	0.034 U	Area 8-B98-SS10-20230802	930	0.00004	0.00004	--
	Area 8-B98-IA11-20230801	0.028 J	Area 8-B98-SS11-20230802	180	0.00016	--	SS << PAL
	Area 8-B98-IA12-20230801	0.12	Area 8-B98-SS12-20230802	24	0.0050	--	
Trichloroethene	Area 8-B98-IA1-20230801	0.033 J	Area 8-B98-SS1-20230801	9.8	0.0034	--	SS << PAL
	Area 8-B98-IA2-20230801	0.016 J	Area 8-B98-SS2-20230801	11	0.0015	--	
	Area 8-B98-IA3-20230801	0.026 J	Area 8-B98-SS3-20230801	15	0.0017	--	
	Area 8-B98-IA4-20230801	0.081	Area 8-B98-SS4-20230801	77	0.0011	0.0011	--
Trichloroethene (continued)	Area 8-B98-IA5-20230801	0.22	Area 8-B98-SS5-20230801	14 U	0.016	--	SS << PAL
	Area 8-B98-IA6-20230801	0.03 J	Area 8-B98-SS6-20230802	6.3	0.0048	--	SS << PAL
	Area 8-B98-IA7-20230801	0.034 J+	Area 8-B98-SS7-20230802	33	0.0010	0.0010	--
	Area 8-B98-IA8-20230801	0.016 J	Area 8-B98-SS8-20230802	560	0.000029	0.00003	--
	Area 8-B98-IA9-20230801	0.033 J	Area 8-B98-SS9-20230802	380	0.000087	0.000087	--
	Area 8-B98-IA10-20230801	0.018 J	Area 8-B98-SS10-20230802	1,100	0.000016	0.000016	--
	Area 8-B98-IA11-20230801	0.031 J	Area 8-B98-SS11-20230802	1,000	0.000031	0.000031	--
	Area 8-B98-IA12-20230801	0.15	Area 8-B98-SS12-20230802	24	0.0063	--	SS << PAL
Cis-1,2-Dichloroethene	Area 8-B98-IA8-20230801	0.032 U	Area 8-B98-SS8-20230802	130	0.00025	--	SS << PAL
	Area 8-B98-IA9-20230801	0.029 U	Area 8-B98-SS9-20230802	1.2 J	0.02417	--	SS low (no PAL)
	Area 8-B98-IA10-20230801	0.034 U	Area 8-B98-SS10-20230802	19	0.0018	--	
	Area 8-B98-IA11-20230801	0.027 J	Area 8-B98-SS11-20230802	16	0.0017	--	
	Area 8-B98-IA12-20230801	0.013 J	Area 8-B98-SS12-20230802	0.77 U	0.017	--	
Trans-1,2-Dichloroethene	Area 8-B98-IA1-20230801	3.4	Area 8-B98-SS1-20230801	0.6 J	5.7	--	IA greater than SS, indicating background source
	Area 8-B98-IA2-20230801	0.99	Area 8-B98-SS2-20230801	0.59 J	1.7	--	
	Area 8-B98-IA3-20230801	3.5	Area 8-B98-SS3-20230801	1.5 J	2.3	--	
	Area 8-B98-IA4-20230801	0.95	Area 8-B98-SS4-20230801	1.4 J	0.68	--	SS << PAL

Table H-9 (continued). Empirical Attenuation Factors for Building

Compound	Indoor Air		Sub-Slab Vapor		Attenuation Factor		
	Sample Name	Concentration (µg/m³)	Sample Name	Concentration (µg/m³)	IA / SS Ratio	Excluding Data Influenced by Background	Reason for Excluding
Trans-1,2-Dichloroethene (continued)	Area 8-B98-IA5-20230801	0.6	Area 8-B98-SS5-20230801	15 U	0.040	--	
	Area 8-B98-IA6-20230801	0.38	Area 8-B98-SS6-20230802	1.8 J	0.21	--	
	Area 8-B98-IA7-20230801	0.46 J+	Area 8-B98-SS7-20230802	4.1	0.11	--	
	Area 8-B98-IA8-20230801	3.2	Area 8-B98-SS8-20230802	6.4	0.50	--	SS << PAL
	Area 8-B98-IA9-20230801	1.3	Area 8-B98-SS9-20230802	11	0.12	--	
	Area 8-B98-IA10-20230801	1.3	Area 8-B98-SS10-20230802	16	0.081	--	
	Area 8-B98-IA11-20230801	0.93	Area 8-B98-SS11-20230802	11	0.085	--	
	Area 8-B98-IA12-20230801	8.2	Area 8-B98-SS12-20230802	14	0.59	--	
1,1-Dichloroethene	Detected only in B98-SS11 and B98-IA13						
Vinyl Chloride	Not detected in any samples at Building 98						
January 2024 Sampling Event							
Tetrachloroethene	Area 8-B98-IA1-20240110	0.09	Area 8-B98-SS1-20240110	12	0.0075	--	
	Area 8-B98-IA2-20240110	0.096	Area 8-B98-SS2-20240110	5.3	0.0181	--	
	Area 8-B98-IA3-20240110	0.089	Area 8-B98-SS3-20240110	2.7	0.033	--	
	FD-3-20240110	0.088	Area 8-B98-SS3-20240110	2.7	0.033	--	
	Area 8-B98-IA4-20240110	0.097	Area 8-B98-SS4-20240110	5.8	0.017	--	
	Area 8-B98-IA5-20240110	0.74	Area 8-B98-SS5-20240110	35	0.021	--	
	Area 8-B98-IA6-20240110	0.0	Area 8-B98-SS6-20240110	80	0.0005	--	
	Area 8-B98-IA7-20240110	0.042	Area 8-B98-SS7-20240110	110	0.0004	--	
	Area 8-B98-IA8-20240110	0.11	Area 8-B98-SS8-20240110	220	0.0005	--	
	Area 8-B98-IA9-20240110	0.15	Area 8-B98-SS9-20240110	7.5	0.02000	--	SS << PAL
	Area 8-B98-IA10-20240110	0.14	Area 8-B98-SS10-20240110	1,400	0.00010	0.00010	--
			FD-5-20240110	1,300	0.00011	0.00011	--
	Area 8-B98-IA11-20240110	0.12	Area 8-B98-SS11-20240110	460	0.00026	0.00026	--
	Area 8-B98-IA12-20240110	0.092	Area 8-B98-SS12-20240110	74	0.0012	--	SS << PAL
Trichloroethene	Area 8-B98-IA1-20240110	0.15	Area 8-B98-SS1-20240110	37	0.0041	0.0041	--
	Area 8-B98-IA2-20240110	0.17	Area 8-B98-SS2-20240110	18	0.0094	--	SS << PAL
	Area 8-B98-IA3-20240110	0.15	Area 8-B98-SS3-20240110	16	0.0094	--	
	FD-3-20240110	0.14	Area 8-B98-SS3-20240110	16	0.0088	--	
	Area 8-B98-IA4-20240110	0.18	Area 8-B98-SS4-20240110	110	0.0016	0.0016	--
	Area 8-B98-IA5-20240110	0.36	Area 8-B98-SS5-20240110	34	0.011	0.0106	--
	Area 8-B98-IA6-20240110	0.063	Area 8-B98-SS6-20240110	84	0.00075	0.00075	--

Table H-9 (continued). Empirical Attenuation Factors for Building

Compound	Indoor Air			Sub-Slab Vapor			Attenuation Factor		
	Sample Name	Concentration (µg/m³)		Sample Name	Concentration (µg/m³)		IA / SS Ratio	Excluding Data Influenced by Background	Reason for Excluding
Trichloroethene (continued)	Area 8-B98-IA7-20240110	0.064		Area 8-B98-SS7-20240110	170		0.00038	0.00038	--
	Area 8-B98-IA8-20240110	0.19		Area 8-B98-SS8-20240110	530		0.00036	0.00036	--
	Area 8-B98-IA9-20240110	0.29		Area 8-B98-SS9-20240110	170		0.0017	0.0017	--
	Area 8-B98-IA10-20240110	0.23		Area 8-B98-SS10-20240110	1,100		0.00021	0.00021	--
				FD-5-20240110	1,100		0.00021	0.00021	--
	Area 8-B98-IA11-20240110	0.2		Area 8-B98-SS11-20240110	1,000		0.00020	0.00020	--
	Area 8-B98-IA12-20240110	0.068		Area 8-B98-SS12-20240110	69		0.0010	0.0010	--
Cis-1,2-Dichloroethene	Area 8-B98-IA1-20240110	0.093		Area 8-B98-SS1-20240110	0.74	U	0.13	--	SS low (no PAL)
	Area 8-B98-IA2-20240110	0.12		Area 8-B98-SS2-20240110	0.87	U	0.14	--	
	Area 8-B98-IA3-20240110	1.1		Area 8-B98-SS3-20240110	0.79	U	1.4	--	IA > SS, indicating background source
	FD-3-20240110	1.1		Area 8-B98-SS3-20240110	0.79	U	1.4	--	
	Area 8-B98-IA4-20240110	0.1		Area 8-B98-SS4-20240110	0.7	U	0.14	--	SS low (no PAL)
	Area 8-B98-IA5-20240110	0.051		Area 8-B98-SS5-20240110	0.62	U	0.082	--	
	Area 8-B98-IA6-20240110	0.025	J	Area 8-B98-SS6-20240110	0.41	J	0.061	--	
	Area 8-B98-IA7-20240110	0.026	J	Area 8-B98-SS7-20240110	1.5	J	0.017	--	
	Area 8-B98-IA8-20240110	0.12		Area 8-B98-SS8-20240110	110		0.0011	0.0011	--
	Area 8-B98-IA9-20240110	0.22		Area 8-B98-SS9-20240110	1.2	J	0.18	--	SS low (no PAL)
	Area 8-B98-IA10-20240110	0.16		Area 8-B98-SS10-20240110	20		0.0080	0.0080	--
				FD-5-20240110	19		0.0084	0.0084	--
	Area 8-B98-IA11-20240110	0.12		Area 8-B98-SS11-20240110	16		0.0075	0.0075	--
	Area 8-B98-IA12-20240110	0.15		Area 8-B98-SS12-20240110	0.47	J	0.32	--	SS low (no PAL)
Trans-1,2-Dichloroethene	Area 8-B98-IA1-20240110	66	D	Area 8-B98-SS1-20240110	16		4.1	--	IA > SS, indicating background source rather than VI
	Area 8-B98-IA2-20240110	75	D	Area 8-B98-SS2-20240110	37		2.0	--	
	Area 8-B98-IA3-20240110	740	D	Area 8-B98-SS3-20240110	110		6.7	--	
	FD-3-20240110	790	D	Area 8-B98-SS3-20240110	110		7.2	--	
	Area 8-B98-IA4-20240110	62	D	Area 8-B98-SS4-20240110	29		2.1	--	

Table H-9 (continued). Empirical Attenuation Factors for Building

Compound	Indoor Air			Sub-Slab Vapor			Attenuation Factor		
	Sample Name	Concentration (µg/m³)		Sample Name	Concentration (µg/m³)		IA / SS Ratio	Excluding Data Influenced by Background	Reason for Excluding
Trans-1,2-Dichloroethene (continued)	Area 8-B98-IA5-20240110	32		Area 8-B98-SS5-20240110	7		4.6	--	IA > SS, indicating background source
	Area 8-B98-IA6-20240110	18		Area 8-B98-SS6-20240110	12		1.5	--	
	Area 8-B98-IA7-20240110	18		Area 8-B98-SS7-20240110	24		0.75	--	SS << PAL
	Area 8-B98-IA8-20240110	72	D	Area 8-B98-SS8-20240110	12		6.0	--	IA > SS, indicating background source rather than VI
	Area 8-B98-IA9-20240110	140	D	Area 8-B98-SS9-20240110	34		4.1	--	
	Area 8-B98-IA10-20240110	91	D	Area 8-B98-SS10-20240110	41		2.2	--	
				FD-5-20240110	39		2.3	--	
	Area 8-B98-IA11-20240110	73	D	Area 8-B98-SS11-20240110	21		3.5	--	
	Area 8-B98-IA12-20240110	120	D	Area 8-B98-SS12-20240110	64		1.9	--	
1,1-Dichloroethene	Area 8-B98-IA3-20240110	0.074		Area 8-B98-SS3-20240110	0.79	U	0.094	--	SS << PAL
	FD-3-20240110	0.082		Area 8-B98-SS3-20240110	0.79	U	0.10	--	
	Area 8-B98-IA5-20240110	0.046		Area 8-B98-SS5-20240110	0.62	U	0.074	--	
	Area 8-B98-IA7-20240110	0.034	U	Area 8-B98-SS7-20240110	2.3	J	0.015	--	
	Area 8-B98-IA10-20240110	0.035	U	Area 8-B98-SS10-20240110	1.1	J	0.032	--	
				FD-5-20240110	1.2	J	0.029	--	
	Area 8-B98-IA11-20240110	0.034	U	Area 8-B98-SS11-20240110	1.4	J	0.024	--	
Vinyl Chloride	Not detected in any samples at Building 98								
							Maximum:	**0.005**	

Notes:
Gray shaded cells indicate that the sample concentration is greater than the project action limit.
Attenuation factors were estimated for collocated samples with analytes that were detected in sub-slab vapor samples as the ratio of the indoor air to sub-slab vapor concentrations.
Attenuation factors calculated with non-detect indoor air results are an upper-bound estimate for that set of collocated samples.
-- – not applicable
Acronyms/Abbreviations:
µg/m³ – microgram per cubic meter
D – the reported result is from a dilution
IA – indoor air
J – estimated below the reporting limit
PAL – project action limit
SS – sub-slab vapor
U – not detected
VI – vapor intrusion

Table H-10. Reevaluated Sub-Slab Results for Building

Analyte Name					Tetrachloroethene		Trichloroethene		cis-1,2-Dichloroethene		trans-1,2-Dichloroethene		1,1-Dichloroethene		Vinyl chloride	
PAL Soil Gas - Sub-slab (µg/m³)					1,330		66.7		1,330		1.330		6,670		93.3	
Building-Specific Screening Level (BSAF=0.005) Soil Gas - Sub-slab (µg/m³)					8,000		400		8,000		8,000		40,000		560	
Location Name	Sample Name	Sample Type	Collect Date	Description	Result (µg/m³)											
August 2023																
Area 8-B98-SS1	Area 8-B98-SS1-20230801	N	8/1/2023*	Soil Gas - Sub-slab	3.1		10		0.73	U	0.6	J	0.73	U	0.73	U
Area 8-B98-SS2	Area 8-B98-SS2-20230801	N	8/1/2023	Soil Gas - Sub-slab	6.3		11		0.76	U	0.59	J	0.76	U	0.76	U
Area 8-B98-SS3	Area 8-B98-SS3-20230801	N	8/1/2023	Soil Gas - Sub-slab	0.73	J	15		0.78	U	1.5	J	0.78	U	0.78	U
Area 8-B98-SS4	Area 8-B98-SS4-20230801	N	8/1/2023	Soil Gas - Sub-slab	1.2	J	77		0.88	U	1.4	J	0.88	U	0.88	U
Area 8-B98-SS5	Area 8-B98-SS5-20230801	N	8/1/2023	Soil Gas - Sub-slab	15	U	14	U	15	U	15	U	15	U	15	U
Area 8-B98-SS6	Area 8-B98-SS6-20230802	N	8/2/2023	Soil Gas - Sub-slab	6.1		6		0.77	U	1.8	J	0.77	U	0.77	U
Area 8-B98-SS7	Area 8-B98-SS7-20230802	N	8/2/2023	Soil Gas - Sub-slab	2.8		33		0.79	U	4.1		0.79	U	0.79	U
Area 8-B98-SS8	Area 8-B98-SS8-20230802	N	8/2/2023	Soil Gas - Sub-slab	150		560		130		6.4		1.5	U	1.5	U
Area 8-B98-SS9	Area 8-B98-SS9-20230802	N	8/2/2023	Soil Gas - Sub-slab	30		380		1.2	J	11		0.77	U	0.77	U
Area 8-B98-SS10	Area 8-B98-SS10-20230802	N	8/2/2023	Soil Gas - Sub-slab	930		1,100		19		16		2.6	U	2.6	U
Area 8-B98-SS11	Area 8-B98-SS11-20230802	N	8/2/2023	Soil Gas - Sub-slab	180		1,000		16		11		1.1	J	1.9	U
Area 8-B98-SS12	Area 8-B98-SS12-20230802	N	8/2/2023	Soil Gas - Sub-slab	24		24		0.77	U	14		0.77	U	0.77	U
Area 8-B98-SS1	Area 8-B98-SS1-20230801	N	8/1/2023	Soil Gas - Sub-slab	3.1		10		0.73	U	0.6	J	0.73	U	0.73	U
January 2024																
Area 8-B98-SS1	Area 8-B98-SS1-20240110	N	1/10/2024	Soil Gas - Sub-slab	12		37		0.74	U	16		0.74	U	0.74	U
Area 8-B98-SS2	Area 8-B98-SS2-20240110	N	1/10/2024	Soil Gas - Sub-slab	5.3		18		0.87	U	37		0.87	U	0.87	U
Area 8-B98-SS3	Area 8-B98-SS3-20240110	N	1/10/2024	Soil Gas - Sub-slab	2.7		16		0.79	U	110		0.79	U	0.79	U
Area 8-B98-SS4	Area 8-B98-SS4-20240110	N	1/10/2024	Soil Gas - Sub-slab	5.8		110		0.7	U	29		0.7	U	0.7	U
Area 8-B98-SS5	Area 8-B98-SS5-20240110	N	1/10/2024	Soil Gas - Sub-slab	35		34		0.62	U	7		0.62	U	0.62	U
Area 8-B98-SS6	Area 8-B98-SS6-20240110	N	1/10/2024	Soil Gas - Sub-slab	80		84		0.41	J	12		0.78	U	0.78	U
Area 8-B98-SS7	Area 8-B98-SS7-20240110	N	1/10/2024	Soil Gas - Sub-slab	110		170		1.5	J	24		2.3	J	0.76	U
Area 8-B98-SS8	Area 8-B98-SS8-20240110	N	1/10/2024	Soil Gas - Sub-slab	220		530		110		12		0.87	U	0.87	U
Area 8-B98-SS9	Area 8-B98-SS9-20240110	N	1/10/2024	Soil Gas - Sub-slab	7.5		170		1.2	J	34		0.76	U	0.76	U
Area 8-B98-SS10	Area 8-B98-SS10-20240110	P5	1/10/2024	Soil Gas - Sub-slab	1,400		1,100		20		41		1.1	J	1.9	U
Area 8-B98-SS10	FD-5-20240110	FD5	1/10/2024	Soil Gas - Sub-slab	1,300		1,100		19		39		1.2	J	1.7	U
Area 8-B98-SS11	Area 8-B98-SS11-20240110	N	1/10/2024	Soil Gas - Sub-slab	460		1,000		16		21		1.4	J	1.9	U
Area 8-B98-SS12	Area 8-B98-SS12-20240110	N	1/10/2024	Soil Gas - Sub-slab	74		69		0.47	J	64		0.72	U	0.72	U

Notes:

Orange shading indicates that the sub-slab vapor concentration is greater than PAL, but not the Building-Specific Screening Level

Pink shading indicates that sub-slab vapor concentration is greater than both the PAL and the Building-Specific Screening Level

*Sample was collected over two days and the start of collection is listed as the date collected; see Section 2.2.1 for more details

Table H-10 (continued). Reevaluated Sub-Slab Results for Building

Acronyms/Abbreviations:
µg/m^3 – micrograms per cubic meter
BSAF – building-specific attenuation factor
FD – field duplicate
J – estimated below the reporting limit
N – normal sample
NE – not established
P – parent sample
PAL – project action limit
SS – sub-slab vapor
U – not detected

Appendix I: SITE INSPECTION CHECKLISTS

Sixth Five-Year Review
NBK Keyport
Keyport, WA

SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site name: *Naval Base Kitsap Keyport*	**Date of inspection:** *July 17, 2024*
Location and Region: *Keyport, WA, Region 10*	**EPA ID:** *WA1170023419*
Agency, office, or company leading the five-year review: *U.S. Navy, Battelle*	**Weather/temperature:** *Clear and sunny, 80s.*

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☒ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☒ Other *OU 1 - Landfill cover, access controls, ICs, phytoremediation, LTM, tide gate upgrade, sediment removal, and contingency actions; OU 2 - access controls, ICs, LTM, HHRA and ERA (Area 8 only), soil removal (Area 8 only), and contingency actions (Area 8 only); Site 23 - TCRA, ICs; Areas 7 & 22 – ICs.*

Attachments: ☐ Inspection team roster attached ☐ Site map attached

Inspection team roster and site map are included in Section 4.0 of the report.

II. INTERVIEWS

(See Appendix B)

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Records**

☒ O&M manual	☒ Readily available	☒ Up to date	☐ N/A
☒ As-built drawings	☒ Readily available	☒ Up to date	☐ N/A
☒ Maintenance logs	☒ Readily available	☒ Up to date	☐ N/A
☒ Health and Safety Plan	☒ Readily available	☒ Up to date	☐ N/A

Remarks *On file at NAVFAC NW and reviewed as part of this FYR*

2. **Institutional Controls Inspection Records** ☒ Readily available ☒ Up to date

Remarks *On file at NAVFAC NW and reviewed as part of this FYR*

IV. O&M COSTS

1. **O&M Organization**

- ☐ State in-house
- ☐ PRP in-house
- ☐ Federal Facility in-house
- ☐ Other
- ☐ Contractor for State
- ☐ Contractor for PRP
- ☒ Contractor for Federal Facility

2. **O&M Cost Records**
☒ Readily available ☒ Up to date
☒ Funding mechanism/agreement in place
Original O&M cost estimate $251,552 ☒ Breakdown attached

Total annual cost by year for review period if available

From FY2020	To	$173,791	☒ Breakdown attached
Date	Date	Total cost	
From FY2021	To	$411,335	☒ Breakdown attached
Date	Date	Total cost	
From FY2022	To	$481,144	☒Breakdown attached
Date	Date	Total cost	
From FY2023	To	$281,665	☒ Breakdown attached
Date	Date	Total cost	
From FY2024	To	$281,721	☒Breakdown attached
Date	Date	Total cost	

3. **Unanticipated or Unusually High O&M Costs During Review Period**
Describe costs and reasons: O&M and LTM costs were roughly in the range anticipated by the ROD, despite substantial variance from the anticipated work performed. LTM was suspended during this FYR period while site recharacterization was conducted. LTM funds were used to support the recharacterization. The OU 1 tide gate required replacement during this FYR period. Vapor intrusion monitoring was conducted at Area 8, which was not anticipated by the ROD. The O&M cost variance from ROD-estimated costs do not, in and of themselves, indicate issues with any of the remedies beyond those issues already identified and which have resulted in the recharacterization efforts underway. See attached breakdown of costs.

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. OU 1

1. **Access to landfill and plantations controlled?** ☒ Yes ☐ No
Remarks *See Section 4.3.1 of FYR report for additional information*

2. **Groundwater wells installed?** ☐ Yes ☒ No
Remarks: *See Section 4.3.1 of FYR report for additional information. Groundwater wells have been installed within this FYR period as part of additional investigation, but no wells have been installed for drinking water or any other purpose besides remediation.*

3. **Any activities that could interfere with remedy or monitoring?** ☐ Yes ☒ No
Remarks

4. **Any permanent workers on landfill?** ☐ Yes ☒ No
Remarks: *An office trailer was temporarily sited on the landfill without prior review by the Navy RPM. The issue was identified, reported to the regulatory agencies and the health issues associated with the trailer were reviewed. Limited duration occupancy of the trailer was approved, however the trailer was subsequently moved off the landfill.*

5. **Any digging in landfill without dig permit?** ☐ Yes ☒ No
Remarks *See Section 4.3.1 of FYR report for additional information.*

6.	**Any disturbance to wetlands?** ☐ Yes ☒ No Remarks *See Section 4.3.1 of FYR report for additional information.*

B. OU 2

1. **Access to Areas 2 and 8 controlled?** ☒ Yes ☐ No
Remarks *See Section 4.3.1 of FYR report for additional information.*

2. **Groundwater wells installed?** ☐ Yes ☒ No
Remarks *See Section 4.3.1 of FYR report for additional information. Groundwater wells have been installed within this FYR period as part of additional investigation, but no wells have been installed for drinking water or any other purpose besides remediation.*

3. **Any digging without dig permit?** ☐ Yes ☒ No
Remarks *See Section 4.3.1 of FYR report for additional information.*

4. **Any land use changes?** ☐ Yes ☒ No
Remarks *See Section 4.3.1 of FYR report for additional information.*

C. Site 23

1. **Asphalt paving at Site 23 still present?** ☒ Yes ☐ No
Remarks

2. **Groundwater wells installed?** ☐ Yes ☒ No
Remarks

3. **Any digging without dig permit?** ☐ Yes ☒ No
Remarks

4. **Any land use change?** ☐ Yes ☒ No
Remarks

D. Area 7

1. **Asphalt paving at Area 7 still present?** ☒ Yes ☐ No
Remarks *Shoreline erosion observed at the top of the riprap seawall. If not addressed through facility maintenance activities, continued erosion could impact the paved roadway adjacent to the seawall.*

2. **Groundwater wells installed?** ☐ Yes ☒ No
Remarks *Groundwater wells have been installed within this FYR period as part of additional investigation, but no wells have been installed for drinking water or any other purpose besides remediation.*

3. **Any digging without dig permit?** ☐ Yes ☒ No
Remarks

4. **Any land use change?** ☐ Yes ☒ No

Remarks_____

_____

E. Area 22

1. **Asphalt paving at Area 22 still present?** ☐ Yes ☒ No

Remarks_____

_____

2. **Groundwater wells installed?** ☐ Yes ☒ No

Remarks *Groundwater wells have been installed within this FYR period as part of additional investigation, but no wells have been installed for drinking water or any other purpose besides remediation.*

3. **Any digging without dig permit?** ☐ Yes ☒ No

Remarks *Observed new gravel surface in parking area of Building 108, however no evidence of excavation.*

4. **Any land use change?** ☐ Yes ☒ No

Remarks_____

_____

F. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs properly implemented ☒ Yes ☐ No

Site conditions imply ICs being fully enforced ☒ Yes ☐ No

Type of monitoring (*e.g.*, self-reporting, drive by) *Drive-by, site walk*

Frequency: *Annual*

Responsible party *NAVFAC NW*

Contact *Amanda Rohrbaugh* (Name) *Remedial Project Manager* (Title) *(360) 396-0248* (Phone no.)

Reporting is up-to-date ☒ Yes ☐ No ☐ NA

Specific requirements in decision documents have been met ☒ Yes ☐ No ☐ NA

Violations have been reported ☒ Yes ☐ No ☐ NA

Other problems or suggestions: _____ ☐ Report attached

See discussion in section 4.3.1 of the FYR report. See also Section V.A.4 of this checklist for a discussion of the violation – placement of a temporary office trailer on the landfill at OU 1

_____

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks: *Based on the results of the annual IC inspections and the FYR site inspection, LUCs are adequate and are being properly implementated and maintained site-wide. The prompt resolution of the violation at OU 1 indicates that the IC processes are functioning.*

VI. REMEDY COMPONENTS

A. Paved Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
Areal extent *~ 400 square feet* Depth *~ 6 inches*
Remarks *Areas of settlement with evidence of past ponding in same area as observed during last FYR – north of south phytoremediation plantation.*

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
Lengths *~200 ft each* Widths *~1 inch* Depths *Not measured*
Remarks *Cracks observed in asphalt surface of central landfill running east-west. Cracks are similar in location and dimensions to those observed during last FYR.*

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident
Areal extent_____ Depth_____
Remarks_____

4. **Holes** ☐ Location shown on site map ☒ Holes not evident
Areal extent_____ Depth_____
Remarks_____

5. **Vegetative Cover** ☐ Grass ☐ Cover properly established ☐ No signs of stress
☒ Trees/Shrubs (indicate size and locations on a diagram)
Remarks *See phyotoremediation below*

6. **Alternative Cover (armored rock, concrete, etc.)** ☒ N/A
Remarks_____

7. **Bulges** ☐ Location shown on site map ☐ Bulges not evident
Areal extent *~600 square feet* Height *~6 inches*
Remarks: *In two areas tree roots have caused bulges in the adjacent paved landfill surface. One area at the southeast corner of the north phyotoremediation plantation, and a second area at the northeast corner of the south plantation.*

8. **Wet Areas/Water Damage** ☐ Wet areas/water damage not evident
☐ Wet areas ☐ Location shown on site map Areal extent_____
☒ Ponding ☐ Location shown on site map Areal extent *~400 square feet*
☒ Seeps ☐ Location shown on site map Areal extent *~ 5 square feet*
☐ Soft subgrade ☐ Location shown on site map Areal extent_____
Remarks *See Section VI.A.1 of this checklist regarding evidence of past ponding. One known seep, SP1-1 is regularly monitored – no new seeps observed.*

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ☒ No evidence of slope instability
Areal extent_____
Remarks_____

10. **Monitoring Wells** (within surface area of landfill)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

B. Surface Water Structures at Paved Landfill

1. **Siltation** ☐ Location shown on site map ☒ Siltation not evident
Areal extent_____ Depth_____
Remarks_____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
☒ Vegetation does not impede flow
Areal extent_____ Type *Brush and alder trees*
Remarks *The brush and alder trees growing through the asphalt pavement along old building foundations just north of the south plantation that were noted during the previous FYR are still present.*

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident
Areal extent_____ Depth_____
Remarks_____

4. **Discharge Structure** ☒ Functioning ☐ N/A
Remarks_____

C. Phytoremediation

1. **Condition of Trees** ☐ Excellent health ☐ Some apparent health stress
☒ Severe stress observed
Area of most stress *The trees in the north plantation continue to exhibit more stress than those in the south*
Remarks: *Numerous trees and large branches have fallen. The canopy is no longer closed. Leaf density is low on many trees, and some standing dead or nearly dead trees were observed.*

2. **Performance Monitoring**

Type of monitoring: *Tree health observations*

Frequency: *Monthly/quarterly depending on season*

Remarks *Groundwater elevation monitoring and contaminant concentration trend monitoring were suspended during this FYR period while additional investigation was conducted and with the concurrence of the project team.*

3. **Effectiveness**

☐ Data indicate effective uptake and metabolism of COCs

☒ Data indicate not effective

☐ Data inconclusive

Remarks *Data obtained during this FYR period indicate that the conceptual site model upon which the remedy is based does not depict the full extent of contamination and that unacceptable risks to human and ecological receptors remain, despite the remedy in place. See the FYR report for more discussion*

D. Groundwater, Sediment, and Shellfish Monitoring

1. **Monitoring Wells**

☒ Properly secured/locked ☒ Functioning ☐ Routinely sampled ☒ Good condition
☒ All required wells located ☐ Needs Maintenance ☐ N/A

Remarks: *Monitoring wells maintained as needed as part of long-term monitoring. Regularly scheduled long-term monitoring was paused during this FYR period while additional site investigation was performed. However periodic sampling occurred on an as-needed basis and the wells were inspected during this sampling.*

2. **Monitoring**

Types of monitoring being conducted:

☒ Groundwater (OU 1 and OU 2) ☐ Sediment (OU 2 Area 8) ☐ Shellfish (OU 2 Area 8)

Frequency *Regularly scheduled long-term monitoring was paused during this FYR period while additional site investigation was performed.*

Remarks

3. **Data Trends**

Describe results and trends: *See Section 4.0 of the FYR report.*

E. Other Remedy Components

1. **Soil and Sediment excavations** ☒ Completed ☐ Not Completed
   Remarks: _____
2. **Contingent Remedial Action Plan** ☒ Completed ☐ Not Completed
   Remarks: _____
3. **Tide Gate Upgrade** ☒ Completed ☐ Not Completed
   Remarks: _____

VII. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

See Section 4.0 (Data Review), 5.0 (Technical Assessment) and 6.0 (Issues and Recommendations) of the FYR report.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

See Section 4.0 (Data Review), 5.0 (Technical Assessment) and 6.0 (Issues and Recommendations) of the FYR report.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

See Section 4.0 (Data Review), 5.0 (Technical Assessment) and 6.0 (Issues and Recommendations) of the FYR report.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

See Section 4.0 (Data Review), 5.0 (Technical Assessment) and 6.0 (Issues and Recommendations) of the FYR report.

Breakdown of O&M and LTM Costs

Summary

Year	O&M	LUC/VI	LTM	Total
2020	$ 103,693	$ 28,350	$ 41,748	$ 173,791
2021	$ 103,115	$ 48,625	$ 259,595	$ 411,335
2022	$ 232,400	$ 47,637	$ 201,107	$ 481,144
2023	$ 109,395	$ 46,545	$ 125,725	$ 281,665
2024	$ 112,677	$ 47,941	$ 121,103	$ 281,721

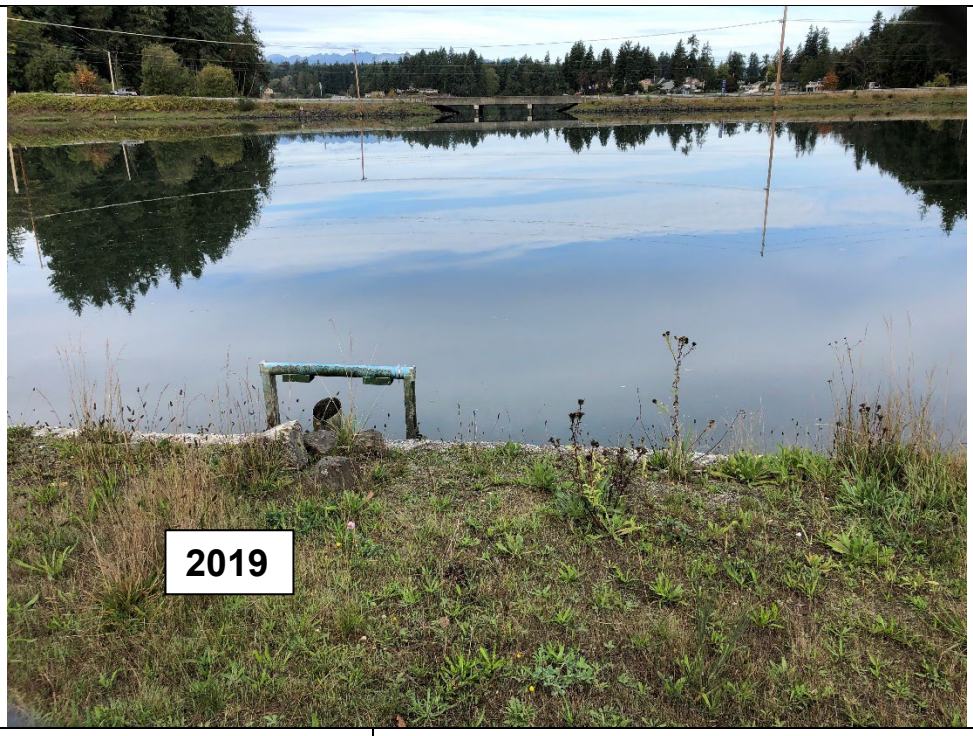
Notes:

No sampling was performed in 2020.

2021 was the first year of VI monitoring.

The tide gate replacement was awarded in 2022.

Appendix J: SITE INSPECTION PHOTOGRAPHIC LOG



File Name: NBK_K_09-19-19_68.jpg **Date Taken:** September 19, 2019	**Photo 1 - Description:** OU 1, View of tide gate and tide flats from SE towards NW in 2019.

File Name: IMG_0970.jpg **Date Taken:** July 17, 2024	**Photo 2 - Description:** OU 1, View of replaced tide gate and tide flats from SE towards NW in 2024.

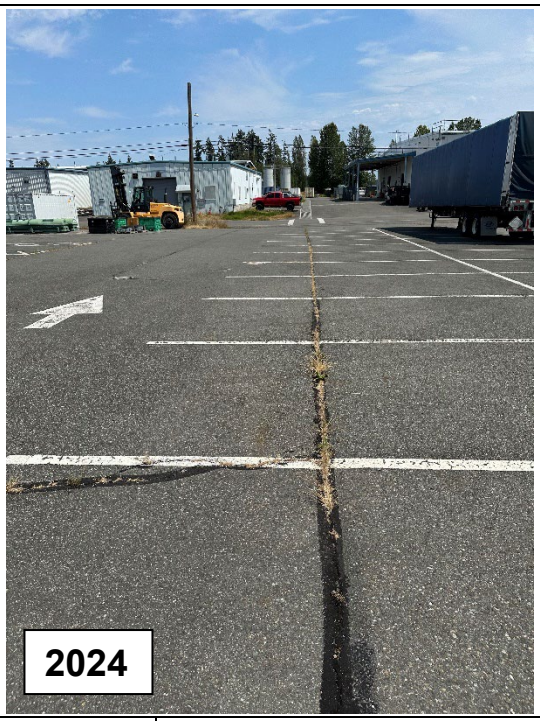
File Name: NBK_K_09-19-19_78.jpg **Date Taken:** September 19, 2019	**Photo 3 - Description:** OU 1, North Plantation view from N to S in 2019.

File Name: IMG_0971.jpg **Date Taken:** July 17, 2024	**Photo 4 - Description:** OU 1, North Plantation view from N to S in 2024.

File Name: IMG_0972.jpg **Date Taken:** July 17, 2024	**Photo 5 - Description:** OU 1, North Plantation example of substantial branches down in 2024.

File Name: IMG_0973.jpg **Date Taken:** July 17, 2024	**Photo 6 - Description:** OU 1, North Plantation – example of loss of canopy closure and dead standing trees in 2024.

File Name: NBK_K_09-19-19_32.jpg **Date Taken:** September 19, 2019	**Photo 7 - Description:** OU 1, Example of cracks in asphalt pavement in Central Landfill, view from W to E in 2019.



File Name: IMG_0974.jpg **Date Taken:** July 17, 2024	**Photo 8 - Description:** OU 1, same crack in asphalt pavement in Central Landfill as seen in 2024.

File Name: NBK_K_09-19-19_29.jpg **Date Taken:** September 19, 2019	**Photo 9 - Description:** OU 1, Bulging and cracking of asphalt pavement due to tree roots, outside southeast corner of North Plantation in 2019.

File Name: IMG_0975.jpg **Date Taken:** July 17, 2024	**Photo 10 - Description:** OU 1, same bulging and cracking of asphalt pavement due to tree roots in 2024.

File Name: NBK_K_09-19-19_61.jpg **Date Taken:** September 19, 2019	**Photo 11 - Description:** OU 1, Water ponding in southern portion of Central Landfill in 2019 (looking north).

File Name: IMG_0976.jpg **Date Taken:** July 17, 2024	**Photo 12 - Description:** OU 1, same area of ponding (looking south) in 2024 after a dry period.

File Name: IMG_0978.jpg **Date Taken:** July 17, 2024	**Photo 13 - Description:** OU 1, Significant vegetative growth through the asphalt pavement in Central Landfill in 2024, also seen in 2019.

File Name: IMG_0979.jpg **Date Taken:** July 17, 2024	**Photo 14 - Description:** OU 1, New monitoring wells and pilot study wells installed at South Plantation.

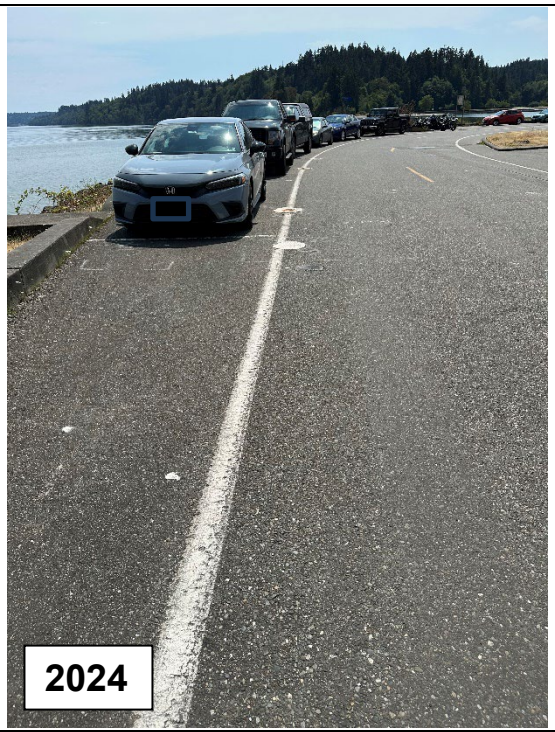
File Name: IMG_0980.jpg **Date Taken:** July 17, 2024	**Photo 15 - Description:** OU 2 Area 2, Van Meter Road area, view of wetlands.

File Name: IMG_0981.jpg **Date Taken:** July 17, 2024	**Photo 16 - Description:** OU 2 Area 2, expanded monitoring well field, view to south.

File Name: IMG_0983.jpg **Date Taken:** July 17, 2024	**Photo 17 - Description:** OU 2 Area 2, expanded monitoring well field, view to north.

File Name: IMG_0984.jpg **Date Taken:** July 17, 2024	**Photo 18 - Description:** OU 2 Area 2, storm drain structure.

File Name: IMG_0985.jpg **Date Taken:** July 17, 2024	**Photo 19 - Description:** OU 2 Area 8, additional wells installed for supplemental RI.



File Name: IMG_0986.jpg **Date Taken:** July 17, 2024	**Photo 20 - Description:** OU 2 Area 8, looking south along shoreline, new wells for supplemental RI – pavement intact.

File Name: IMG_0987.jpg **Date Taken:** July 17, 2024	**Photo 21 - Description:** OU 2 Area 8, looking north along shoreline, new wells for supplemental RI – pavement intact.

File Name: IMG_0989.jpg **Date Taken:** July 17, 2024	**Photo 22 - Description:** OU 2 Area 8, location of former Building 72 – pavement intact.

File Name: IMG_0988.jpg **Date Taken:** July 17, 2024	**Photo 23 - Description:** OU 2 Area 8, Intertidal zone along SE boundary of site at high tide.

File Name: IMG_0990.jpg **Date Taken:** July 17, 2024	**Photo 25 - Description:** Area 7 shoreline looking south, showing erosion at the top of the seawall.

File Name: IMG_0991.jpg **Date Taken:** July 17, 2024	**Photo 26 - Description:** Area 7 shoreline looking north, showing erosion at the top of the seawall.

File Name: IMG_0992.jpg **Date Taken:** July 17, 2024	**Photo 26 - Description:** Area 22 evidence of recent construction activity near Building 108.

Appendix K: RESPONSES TO COMMENTS ON DRAFT DOCUMENT

Suquamish Tribe Review Comments

Date of Review:	**4/22/2025**			Page 1 of
Project Title: **Draft Sixth Five Year Review, NBK Keyport**			Reviewer:	**Denice Taylor**
			Code:	
Project Number:			Phone:	

ITEM NO.	*Pg #, Section, Line*	*COMMENTS*	*REVIEW ACTION* (Provide explanation & location of changes as necessary)	
			NAVY RESPONSE (AS REVISED)	*COMMENT ON RESPONSE*
1	General	The Suquamish Tribe agrees with the finding that the OU 1 remedy is not protective. The Tribe also agrees that the recently completed HHRA/ERA identifies actionable risks to human health and the environment not previously addressed by the OU 1 ROD or remedy. Further remedial actions will be necessary to ensure long-term protectiveness. In general, the Tribe supports actions that remove or treat contamination and lead to the restoration and protection of treaty rights and resources, including the right to safely harvest and consume shellfish.	Noted, thank you.	
2	General	The Tribe does not agree with the recommendation regarding WDOH shellfish area classifications and any implied Navy action to limit or prohibit shellfish harvesting in Liberty Bay under the existing OU 1 ROD or IC/LUC plan. As noted in the report, the WDOH classifications are not related to conditions or exposure pathways addressed by the existing OU 1 ROD. The Tribe believes harvest management decisions are the jurisdiction of WDOH and the Suquamish Tribe. Please revise the recommendation to coordinate with WDOH and the Suquamish Tribe regarding the findings of the HHRA/ERA, the status of WDOH shellfish area classifications in Liberty Bay and future risk/harvest management decisions. Also review the discussion in Section 5, starting on pg 5-3, and revise for consistency with the recommendation.	Revisions made to the FYR address this comment based on the updated status on WDOH's website of shellfish closures/restrictions since publication of the draft FYR. The recommendations were revised to clarify the need to coordinate with WDOH and the Suquamish Tribe regarding the evaluation and management of shellfish harvesting. **Additional Response:** Upon further review, we agree that the wording of the issue implies LUCs are present that are not actually written into the OU 1 ROD. Since the current WDOH restrictions appear to coincidently be acting to interrupt the current exposure pathway, we suggest the following revision: "The existing WDOH restrictions on shellfish harvesting and consumption are currently preventing human health exposures to seafood harvesters while the ROD amendment process is underway; however, there is no site contaminant-related restrictions."	The 5YR did not identify any LUC deficiencies for OU 1. However, the recommendations imply that the LUCs for preventing activities that could lead to human exposure, including risks via consumption of seafood, are not sufficient or not in keeping with the intent of the OU 1 ROD. Given where we are in the OU 1 process, and the fact that Liberty Bay is not currently open for harvest, the Tribe does not believe additional actions to restrict or prohibit harvest need to be taken at this time. As previously stated, the Tribe also believes jurisdiction for managing seafood harvest lies with the WDOH and the Tribe. Recommend further revising language in the 5YR. The specific issue is that the remedy is not protective and there are continued risks to future seafood harvesters. The recommendation is to consult and coordinate with WDOH and the Suquamish Tribe regarding the findings of the HHRA/ERA, the status of WDOH shellfish area classifications in Liberty Bay and future risk/harvest management decisions, as part of the RODA process. The issue is not WDOH language. If the Navy believes LUCs implemented under the current OU 1 ROD are not sufficient, then the 5YR should be revised to clearly explain the issue in context of the intent of the OU 1 ROD and actions the Navy has or has not taken. An example would be the Navy has not placed signage regarding potential risks in accessible locations on Navy property. However, it is unclear if that is a LUC requirement for the site. Any changes to LUCs regarding harvest still require consultation with WDOH and the Suquamish Tribe.
3	Section 5, pages 5-11 and 5-19	Revise description of WDOH status to reflect closed or unclassified. Both conditions are "not open" for harvest/consumption.	This has been reviewed in response to this and other comments (i.e., WA Ecology). The WDOH classification for this site, as posted on its website, changed following correspondence with WDOH and the submission of the draft FYR. **Additional Response:** Copied language from page 5-11 to page 5-19 as suggested.	For consistency in this document, use the same terms to explain the WDOH classification. For example, repeat language from pg 5-11 on pg 5-19.
4	Section 5.4.2.1	Did this review include evaluation of January 2025 changes in the toxicity values for arsenic?	Yes, but arsenic was determined to be at or below background for soil and groundwater. Additional detail was provided by adding the following text: EPA updated the RfD and CPF applied to human health risk assessment of arsenic, and Ecology's CLARC Tables reflected this update in January 2025 with lower groundwater and surface water levels for arsenic. However, as with beryllium and manganese, the concentrations evaluated in groundwater at the time of the ROD were determined to be similar to background and were not considered for RAOs (Navy, EPA and Ecology, 1994). Similarly, soil levels were not established due to occurrence at background concentrations, or where arsenic exceeded background, the presence of other contaminants of concern already triggered actions that would address the elevated concentrations of arsenic detected at that specific site.	Understood that for soil and groundwater As was determined to be at or below background. However, because As can bioaccumulate, for any sediment related exposure pathways, As should only be excluded if site-related risks are below reference area risks, at least for human health. Consider looking at OU 1 and Area 8 incremental risk levels for sediment-related exposures, including seafood consumption. If incremental risks are at or below reference area risks for those pathways, the change in toxicity values would not change the result. If site-related risks are above reference area risks, indicate how site-related risks increase and if that would have an impact on decision-making.

Suquamish Tribe Review Comments

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			NAVY RESPONSE (AS REVISED)	*COMMENT ON RESPONSE*
			Additional Response: For the current review of finalized information, the 1993 HHRA found As concentrations in tissue to be comparable to published reference values for similar shellfish species, as well as low cancer and non-cancer risk estimates for sediments. Therefore, the new arsenic RfD/CSF would not be expected to change the conclusions of the 1993 HHRA. The 2018 HHRA for Area 8 found the As concentrations from reference areas resulted in higher cancer risk estimates than those of the Area 8 beach. Similarly, the non-cancer risk was higher due to the greater concentrations of As at the reference sediments. The more recent HHRA for OU1 (2025) evaluated incremental risk differences and considered concentrations relative to background samples for tissues and sediments. They found increased incremental risks despite similar concentration ranges for sediment and tissue between exposure sites and reference (background) areas. The changes in the EPA RfD/CSF for As would increase the estimated non-cancer and cancer risk estimates for both sites but still arrive at a similar conclusion about the relative risks of reference to exposure areas for OU 1 and OU 8.	
5	Section 5, page 5-20	Revise to state that the consumption rate used was for total shellfish consumption, rather than total seafood consumption.	This has been revised as suggested and the term “seafood” clarified to shellfish where appropriate throughout the document.	Accepted

EPA Review Comments

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ITEM NO.	*Pg #, Section, Line*	*COMMENTS*	*REVIEW ACTION* (Provide explanation & location of changes as necessary)	
			NAVY RESPONSE (AS REVISED)	*COMMENT ON RESPONSE*
1	Executive Summary	Section 6.1.1 does a good job of describing the approach taken on PFAS and protectiveness in this FYR. Given the interest in this emerging class of contaminants, consider including a brief summary of that approach in the Executive Summary.	Added the following in the Executive Summary: "The Navy recognizes per- and polyfluoroalkyl substances (PFAS) as chemicals of emerging concern, and this FYR summarizes the status of the investigations characterizing PFAS in environmental media at NBK Keyport, including: • 2018 and 2019 PFAS sampling at OU 1 and OU 2 Area 8 as part of the long-term monitoring (LTM) sampling program (Navy, 2019b, 2020g). • Basewide PFAS preliminary assessment (PA; Navy, 2020e) • 2021 PFAS sampling at OU 1 (Navy, 2023c) • Basewide PFAS site investigation (SI: Navy, 2023j)"	Accepted
2	Five-Year Review Summary Form	The "Review Period" row typically reflects the period during which the review was conducted, and the report written, not the entire five-year period.	This field has been used in other FYRs to show either the entire period being reviewed (including the past FYRs for NBK Keyport), or the timeframe in which the review itself was conducted. For clarity, the Navy proposes to revise the content of this form field to, "Review Period: November 2024 – November 2025 based on data finalized July 2019 – October 2024"	Accepted
3	Table 1-1	For consistency, add the location of any known groundwater discharges to the Area 2 Physical Characteristics cell.	Added the following text from the ROD, "Shallow groundwater near Area 2 flows northeasterly and discharges into a shallow lagoon."	Accepted
4	Section 2.1.3	Clarify the discussion of LTM in this section to state that although the traditional LTM program has been paused, the other monitoring conducted during this period has met the intent of that ROD-required monitoring. Make the same revision regarding Area 8 in Section 2.2.3. Note also that Section 5.4.1 mentions current ongoing LTM in Area 8 on page 5-15.	Added suggested text "Although the traditional LTM program has been paused, the other monitoring conducted during this period has met the intent of the ROD-required monitoring." to Sections 2.1.3 and 2.2.3. Deleted "current" and "ongoing" from Section 5.4.1.	Accepted
5	Table 3-2	Recommend including a brief conclusion in the description of the PCB investigation, Issue #2, similar to what was done for Issue #3 regarding cVOCs in OU2 Area 2.	The following was added to Table 3-2, "Elevated PCB concentrations appear to be widespread in soil within the landfill waste body from at least the middle of the North Plantation and northward. ISM sampling of sediment from seep SP1-1 to the tide gate was performed in September 2023 as a follow up to initial ISM in this area in June 2021. The PCB evaluation concluded that total PCB concentrations in sediment in the distal reach of Marsh Creek at OU 1 from seep SP1-1 to the tide gate exceed the marine sediment cleanup objective (SCO) of 12 milligrams per kilogram (mg/kg) organic carbon normalized (OC) in several of the ISM decision units."	Accepted
6	Section 4.2.1.3	In discussing PFAS sampling at the end of this section, recommend including which screening values were used for this sampling event.	Added the following text: "The 2022 EPA RSL for tap water (target hazard quotient of 0.1), which is based on the protection of human health via drinking water only, was used as the PFAS PAL."	Accepted
7	Section 5.4.2	This section states that there are "potentially four (4) areas where changes could have occurred…" but presents a list with only three bullets. Review and revise as needed.	Changed "four (4)" to "three (3)".	Accepted
8	Table 6-1	For the OU1 Land Use Controls Issue, recommend accelerating the date to December 2025. Clarification of WDOH terminology and potential signage updates should be able to be accomplished this calendar year, especially since this issue affects current protectiveness.	Navy agrees to accelerate this date to December 2025.	Accepted

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			NAVY RESPONSE (AS REVISED)	*COMMENT ON RESPONSE*
9	Table 6-2	a. For the OU 2 Monitoring Data Recommendation, recommend also noting the tidal stage during these timed depth-to-groundwater measurements to better inform any possible tidal influence in this area. This comment would also apply to the text of this recommendation in Section 4.2.2. b. Recommend including an Other Finding/Recommendation on continuing to investigate PFAS at the site. Acknowledging that the PFAS work is ongoing, including it as a recommendation here will provide an added layer of visibility.	Revised the OU 2 Area 2 monitoring recommendation to read, "Collect tidal stage data along with roughly time-coincident depth to groundwater measurements from all available groundwater monitoring wells in the vicinity of OU 2 Area 2 during both wet and dry seasons to update the understanding of groundwater flow." Added a new finding category "Chemicals of Emerging Concern" with a Finding of "PFAS concentrations in environmental media identified to date at NBK Keyport warrant additional investigation." The recommendation will be "Perform planned RIs for PFAS at the sites recommended by the SI."	Accepted
10	Table 7-1	a. The Protectiveness Statements should describe the exposure pathways that are resulting in unacceptable risk. Understanding that some of these pathways are still under investigation, the suspected pathways should still be reported here. b. In the OU2 statement, consider starting with a sentence that describes overall protectives for the entire operable unit. Currently, the table states "Not Protective" but the first sentence of the statement reads "…Area 2 is short-term protective.", which could lead to some confusion.	a. The statement added to the OU 2 protectiveness statement in response to part (b) of this comment will clearly identify the exposure pathway. For OU 1, the following phrase will be added "…to both human and ecological receptors…." to the penultimate sentence. b. The following sentence was added at the beginning of the Protectiveness Statement: "Overall, OU 2 is not protective because the remedy at Area 8 is not protective of ecological receptors." **Additional Response:** The following text was added to Table 7-1: "Human health risks are primarily driven by exposure to COCs in sediment, surface water, and through consumption of shellfish. COCs in sediment and porewater occur at higher concentrations than previously understood and present a potential pathway for unacceptable risk for ecological receptors at OU 1."	EPA appreciates that a change was made to include which receptors the remedies are not protective of, but the comment requested also identifying which exposure pathway(s) drive that unacceptable risk. That information is included for OU2 ("*acute and chronic exposure to accumulated contaminants in sediment"*), but a similar statement does not appear in the write-up for OU1. Even though some pathways are still under investigation in OU1, a something similar to the language in OU2 should be included here, based on the best information available at the time of the report. This statement could even reflect the uncertainty in pathway, but should give the reader some sense of what we believe it is.
11	Section 8	Understanding that the Navy sets the date for the next FYR based on the signature date for this FYR, some more specificity in the date would be beneficial. Consider including an explanation of how these dates are set and include a target date, or at least a target month.	Changed to: "The next FYR report is required for OU 1 and OU 2 at NBK Keyport and should be completed by in late 2030, which will be five years from the completion date of this review", which is similar to what is used in the EPA template.	Accepted

Ecology Review Comments

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ITEM NO.	*Pg #, Section, Line*	*COMMENTS*	*REVIEW ACTION* (Provide explanation & location of changes as necessary)	
			NAVY RESPONSE (AS REVISED)	*COMMENT ON RESPONSE*
1	General	It would benefit the report to provide administrative context i.e., identify investigations where the Keyport Team did not reach consensus or have an opportunity to review prior to finalization. For example, Navy 2024f was finalized without review by Ecology and other members of the Keyport Team.	The cited reference is the only case where contractual limitations resulted in a document needing to be finalized without Keyport Project Team input. The following has been added to the end of Section 4.2.3.2, "Because of contractual timing limitations, the report of this bench-scale study was finalized without Keyport Project Team input. Input from the Keyport Project Team regarding this study will be incorporated into the upcoming FFS for Area 8."	Accepted
2	General	Please make text clear that SCUM is guidance, SMS is a rule. Also no need to say 'II" after SCUM, just state "SCUM".	The following sentence in Section 5 pg 5-12, 3rd paragraph is clear on SCUM being a guidance and SMS being a regulation: "The work plan (Navy 2024a) for the in-progress HHRA/ERA addendum incorporates the SMS regulation and SCUM guidance, and the HHRA/ERA is being performed with the review and oversight of Ecology." Ensured it was clear elsewhere in the document. Also removed "II" after SCUM. **Additional Response:** The line numbers reported are based off the clean (or "no markup') version of the FYR. Changed reference to Section, page, and paragraph to indicate text location and to prevent issues related to changes in line numbers. Please also note that line numbers are typically removed for the clean final document and will not be present in the clean final version.	Accept. Ecology is noting that lines 423 to 425 are missing on the redline mark up, the quoted text is on lines 449-452. For accuracy update the RTC table to identify the correct reference in the report, or include lines 423 to 425 in the draft report, lines ## to ### in the final report. (Updated as needed, if additional changes are made).
3	General	Throughout the report, there are multiple instances where it states that sampling and LUCs/signage placement "ensure" protectiveness or "ensure" COCs do not pose a hazard. These are not accurate statements. Sampling can be done to assess hazard. LUCs can help to minimize the potential for exposure to contamination and/or protect the integrity of a response action.	Searched for the word "ensure" and revised associated wording where appropriate.	Accepted
4	Table 3-2 & Table 3-3	Editorial: Considering adding Not applicable or N/A to blank spaces in the column "Reference or completion date (if applicable)".	Added "N/A" as suggested.	Accepted
5	2.1.3.2	In the discussion on LUCs it would be helpful to have the mechanism for the control specified. For instance, what mechanism(s) prevent the installation of drinking water wells, interference with remedial activities, etc. Are these proprietary controls, government controls, administrative, etc.?	Added at the end of the first paragraph under Land Use Controls, "These LUCs have been maintained through a Navy permit process which requires all proposed construction activity to be reviewed and approved by the Navy Environmental Remedial Project Manager (RPM), who assesses proposals against the IC Plan requirements (Navy 2020d)." **Additional Response:** The land use controls are specified on page 2-8 by area (shown on Figure 2-1).	Ecology agrees with this addition. It would be helpful to have the individual LUCs specified.
6	4.1.3 & Appendix B	Line 158 - Should this read "like Ecology" or "like Ecology and the EPA"? It is unclear if this is a direct quote from the Suquamish Tribe. The interview from the Suquamish Tribe Project Manager appears to be missing from Appendix B.	Changed to "Like Ecology and EPA…" Added Suquamish Tribe PM's interview form into Appendix B.	Accepted
7	4.2.1.1	Line 444 - Figures documenting the CVOC depths are Figure 4-10 through 4-16 not Figure 4-9 through 4-15.	Changed as suggested.	Accepted
8	4.2.1.3	Line 620 - 623 - Ecology would suggest text state "A ROD amendment should also consider removing **or modifying** the requirement of CRA-specific monitoring..." With the focus feasibility study and ROD amendment not complete it is unknown if additional CRA monitoring will be necessary.	Changed as suggested.	Accepted

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			NAVY RESPONSE (AS REVISED)	*COMMENT ON RESPONSE*
9	4.3.1	The text states that the LUC permitting process did not prevent siting the office trailer on the landfill. Have any corrective actions been taken, such as modifying a LUC or layering an additional LUC?	The actions taken were to clarify the permitting workflow with the current permitting staff. This information will be added to the second paragraph of Section 4.3.1	Accepted
10	Figure 4-17	The geologic cross section lacks the context of where, spatially, the line D-D' was drawn	Understood. As noted in the figure title, this cross section is provided as an example illustrating the ESS work performed as part of the supplemental remedial investigation. Figure 4-17 has been updated to include the following note: The full suite of cross sections, along with a plan view figure showing the cross section locations, is available in Volume 1 of the supplemental remedial investigation.	Accepted
11	4.2 - General	This section contains statements regarding recommendations both from the reports of reference and in the context of the Five-Year Review. Ecology would recommend that recommendations in the text specifically for this Five-Year Review include a reference to Tables 6-1 and 6-2.	Added callouts to Table 6-1 and 6-2 to the text on pg 4-32, 2nd full paragraph, pg 4-43 4th full paragraph, pg 4-45, 1st paragraph (not full). and pg 4-51, first full paragraph. **Additional Response:** The line numbers reported are based off the clean (or "no markup') version of the FYR. When viewing the report in tracked changes mode, the line numbers are different than what is reported in the RTC table. Changed reference to page, and paragraph to indicate text location to prevent issues related to changes in line numbers. Please also note that line numbers are typically removed for the clean final document and will not be present in the clean final version.	Accepted again the lines in the text do not appear to match the redline report. 613-614 is on 620 – 622, 1023 is on 1032, and 1072 is on 1081. See Ecology comment 2.
12	4.2.2	Line 967-968 - Consider stating the number of sample results rejected and the cause for rejection. From context, it is the temperature exceedance, but the phrasing could be clearer.	Added "for non-detect analytes were…" to clarify which results were rejected due to elevated temperature of samples. Also added that 754 results were rejected.	Accepted.
13	5. 1	Text states that WDOH has butter clams and varnish clams designated as "unclassified". However, on the WDOH website it states "listed for closure" regarding butter clams and varnish clams (for biotoxins) and "closure for" regarding clams, geoduck, scallops, mussels and oysters (for pollution). Therefore it's unclear why the language would be changed to unclassified for this report. For consistency with other reports, the term "closed" is accurate. https://fortress.wa.gov/doh/biotoxin/biotoxin.html	The report has been revised in multiple sections where this subject is discussed in response to this and other similar comments (i.e., Suquamish Tribe). The WDOH classification for this site, as posted on its website, changed following correspondence with WDOH and the submission of the draft FYR.	Accepted.
14	5.4.1	For both benthic and bioaccumulative criteria, the sediment cleanup level can be established within a range of levels at the SCO, the CSL, or at a level in between (SCUM Chapter 7, Figure 7-1). SCO uses natural background and CSL uses regional background. The sediment cleanup level can be adjusted upwards from the SCO without exceeding the CSL (WAC 173-204-560(2)(a)(iii)) based on technical possibility and net adverse environmental impacts (see SCUM Chapter 7, Section 7.2.3.) If a sediment cleanup level other than the SCO is proposed in the RI Report, a discussion and rationale should be presented for increasing the cleanup level based on these adjustment factors. A sediment cleanup level is the concentration or level of biological effects for a contaminant in sediment that is determined by the department to be protective of human health and the environment. The sediment cleanup level is established in accordance with the requirements in WAC 173-204-560(2). The sediment cleanup level is initially established at the sediment cleanup objective and may be	For OU 1, additional text has been added to clarify this and provide more specificity (Lines 291-294, lines 408-410). Existing text from lines 424-437 capture this in addition to reflecting the consideration of the updated guidance (as of 2013) along with the forthcoming HHRA/ERA information for evaluating ARARs and the consideration of background. No additional text was added regarding sediment in OU 2 as there were no numeric criteria set in the OU 2 ROD. The additions to the text provide more specificity to the use of CSLs compared to the original ROD for OU 1. The discussion of sediments and background here is limited to lines 421-424 which explain, as stated in this comment, the need to consider natural versus regional background. Consistent with past FYRs that have not detailed this decision process for determining background, further discussion seems premature given the need to have data from the updated HHRA/ERA addendum. **Additional Response:** The bullet list at the beginning of Section 5.4.1 identifies ARARs that have changed since the time of the ROD. Therefore, the sediment management standards are properly included. The details regarding the SMS that are currently included in the FYR, and the additional details that are proposed in Ecology's comment, are not necessary in order	This comment does not appear to be addressed. - Text was added to the first bullet of 5.4.1 (lines 307-309) regarding SCOs and CSLs; however, these regulations were not changed, so should not be included in a list of regulatory changes. - New text on pages 5-12 says "background" but does not specify regional or natural. This qualifier should be added. - Please add the following to Section 5.4.1: o Description that the sediment cleanup level process more clearly and accurately (see initial comment for details). o Clarification when text is describing SCO or CSL o Description that there needs to be a clear rationale why SCO would be adjusted upward (e.g., why regional background would be used instead of natural background) o Any time "background" concentrations are mentioned (e.g., XX is below background, concentrations exceeding background, based on

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		adjusted upward as appropriate based on whether it is technically possible to meet the sediment cleanup objective and whether meeting the sediment cleanup objective will have a net adverse environmental impact on the aquatic environment as specified in WAC 173- 204-560 (2)(a)(i)(B). A sediment cleanup level may not be adjusted upward above the cleanup screening level. This section should describe this process more clearly and accurately; this includes: - Clarifying when text is describing SCO or CSL - Clarifying when text describing natural background or regional background - Identifying that there needs to be a clear rationale why SCO would be adjusted upward (e.g., why regional background would be used instead of natural background)	to document the ARARs change for this FYR. The Navy will remove the SMS details currently in the text (i.e., second paragraph of OU 1 sediment discussion under Section 5.4.1) and leave the text that makes clear that the Navy will work with the Keyport Project Team following completion of the revised risk assessments to properly establish updated sediment cleanup criteria in accordance with current ARARs. Because the concept of "natural" versus "regional" (or "embayment") background concentrations is particular to the SMS, the comment regarding "natural" versus "regional" background is also addressed by making the overall reference to future adherence to SMS procedures. **Additional Response September 22, 2025:** • The details regarding the SMS in the earlier drafts of FYR, and the additional details that are proposed in Ecology's comment, are not necessary in order to document the ARAR changes for this FYR. This detail is readily available in guidance and other project documents. The Navy continues to believe that the text is not necessary to convey changes in regulatory values since the ROD and respectfully declines to reinstate this text. • A universal definition of the term "background" is not tenable given the scope of this document to summarize the results of other studies. The details regarding "background" are captured in the source documents (such as risk assessments), and the reader is directed to those documents for additional information. An overarching and detailed discussion of how background is determined in all the referenced studies and guidance is not useful to the scope and conclusions in this document, which summarizes the studies performed at the Site since the ROD and over the last five years. • The intent of this section is to present all changes in standards since the ROD, not just the changes over the past five years. The substantial revision of SMS in 2013 was also presented in the fifth FYR, and that ARAR continues to be appropriately called out under this heading. Later text in Section 5.4.1 then shows that the revised ARAR was reviewed, and the relevant numeric value has not changed. Outcome of Meeting 9-29-25: During discussions on a brief conference call between Navy and Ecology, it was agreed that the Section 5.4.1 text describing details of the SMS that the Navy proposed for removal would indeed be removed. It should be noted that removed text pertained to the Area 1 risk assessment update, which was not final during the review period of the current FYR. On page 5-16, Navy agreed to add detail to the mention of "background" concentrations in sediment used for the Area 8 risk assessment update, explaining that this was natural background based on the Ecology Bold dataset. It was agreed that no other changes were needed to resolve this comment.	background levels, etc.), the term "background" should be qualified as being either natural or regional. **Response September 19, 2025:** - Rather than removing the SMS text in the sediment section of 5.4.1, Ecology would like it to be kept in and just be clear on the terms as described in the initial comment. - To add clarity to the use of the term background, add a footnote to the term's first use that explains (1) that the term background is used in EPA's definition and state what that definition is, (2) how the representative background concentration was identified, (3) how that definition compares to Ecology's use of the term - The heading for the bullet list in 5.4.1 is "For this FYR, all sources of ARARs identified in the RODs (Navy, EPA, and Ecology, 1998 and 1994) were reviewed for changes that could affect the assessment of remedy protectiveness. Based on this review, it was concluded that the following regulations listed as ARARs have changed". The part of Washington State Sediment Management Standards (SMS; Chapter 173-204 WAC) which includes ecological benchmarks such as SCOs, cleanup screening levels (CSLs), or levels between if identified in the prior ROD or subsequent site documentation have not changed. As such, this information does not seem to fit under this heading.
15	5.4.1	Line 574: "The HHRA concludes..." Do we mean to reference the HHRA Work plan here? or state "the HHRA likely concludes" to be consistent with the rest of the report re: HHRA is referenced as a not-yet-final document?	This discussion is addressing OU 2 Area 8, for which the HHRA is complete. The Navy proposes no change based on this comment.	Accepted
16	Table 4-3C	Table 4-3C appears to have a print error with the left side of the page obscured.	Table 4-3c has been corrected so the entire table can be seen.	Accepted
17	5.1; Table 6-1	Ecology does not agree with the recommendation for the removal of phytoremediation as currently proposed. The FFS and amended ROD are still several years from approval	The Navy believes that there is ample evidence that the phytoremediation plantations are not making any substantive contribution to site remediation, pose a safety risk, and require monitoring funds that could be better directed towards a more effective,	Ecology understands the rationale given the failure of the remedy and accepts the recommendation provided the decision is verified against the OU 1 ROD. Ecology would request the FYR include in this recommendation that additional Land Use

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ITEM NO.	*Pg #, Section, Line*	*COMMENTS*	*REVIEW ACTION* (Provide explanation & location of changes as necessary)	
			NAVY RESPONSE (AS REVISED)	*COMMENT ON RESPONSE*
		and removal of the phytoremediation trees needs further evaluation to demonstrate that removal would not result in adverse impacts in the interim. The OU 1 ROD (see 11.1.3 & 11.1.4) allows for the discontinuation of the remedy, identify a determination of asphalt vs soil cover would be needed. As workers' health and safety appear to be the main driver for this recommendation, Ecology would concur with and support the removal of snags, debris, and trees identified as being in poor health and posing a risk to workers.	revised remedy. Appropriate cover materials will be evaluated, as needed based on the developed alternatives, in the upcoming FFS and ROD Amendment. The recommendation specifies that verification must be done to ensure removal of trees is allowable under the OU 1 ROD. In addition, the recommendation specifies that stumps can be left in place until implementation of the future revised remedy, which would prevent work exposure to subsurface soils. Based on these caveats, the Navy stands by this recommendation. **Additional Response:** As described in Section 2.1.3, existing land use controls for Area D (Figure 2.1) include "…procedures for controlling activities that involve digging or construction at the landfill that could cause exposures to contaminants in soil, groundwater, or vapor within or from the landfill." These existing controls meet the request of Ecology's additional comment.	Controls to protect should be considered, such as signage prohibiting access and warning of the risks associated with subsurface soils pending a future ROD amendment. **Response September 19, 2025:** Ecology has reviewed the comments. We are comfortable with outstanding comment 17.
18	5.4.1	Line 474 remove the word "slightly" when discussing the difference between the MCL for TCE and the MTCA method B value.	Deleted the word "slightly".	Accepted
19	5.4.2	Line 483. Would it be more accurate to say VC concentrations in monitoring well 2MW-6 above RGs have been observed the majority of the time? "More often than not" is slightly subjective.	Changed "more often than not" to "for the majority of the sampling events."	Accepted
20	Table 6-2	Ecology would recommend adding further details to the recommendation regarding the Monitoring Data at OU 2 Area 2 as stated on Page 4-45. "if pressure transducer data loggers are available, consideration should be given to collecting continuous groundwater elevation data for six (6) months to allow assessment of seasonal and potential tidal variations in groundwater flow direction and gradient".	Added this additional detail to the OU 2 Area 2 monitoring recommendation.	Accepted
21	Table 6-3	Would add a recommendation regarding that PFAS stating work is ongoing, even if only to direct reader to Table 6-3.	Added a site-wide recommendation to Table 6-2 also in response to EPA's similar comment.	Accepted